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JOURNAL OF THE TRANSACTIONS  
OF  
THE VICTORIA INSTITUTE.

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VOL. VIII.

JOURNAL OF  
THE TRANSACTIONS  
OF  
The Victoria Institute,  
OR,  
Philosophical Society of Great Britain.

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EDITED BY THE HONORARY SECRETARY.

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VOL. VIII.



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## PREFACE.

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THE Eighth Volume of the *Journal of the Transactions* of the VICTORIA INSTITUTE is now issued, and it will be found that the importance of the Papers it contains, and of the discussions thereon, has in no way diminished, since the last volume was published. It will also be observed that, so far as possible, the Council has been careful to include in editorial notes, and in what may be called "after papers," any special points which arose, in the papers or discussions themselves, but were not taken up during the meetings.

To the writers of Papers and to those who took part in the discussions, the best thanks of both Members and Associates are due: with respect to the "after papers," it must not be forgotten that some are by authorities, not connected as members with the Institute, but who have generously aided in its work.

The Institute now exchanges transactions with almost all the leading learned societies in London; and the circulation of its publications has doubled, each year since 1870.

As regards the progress of the Society, it has always been felt that it rested in no small degree with the Members and Associates themselves; and this feeling has certainly contributed to the firmness of that support which they have given, and which has tended, not only to the Institute's strength and stability, but to increase public confidence in it. During the past year the number of new Members and Associates has been greater than in any previous year, and it is often gratifying to find that the support of the very few who have retired has not been entirely withdrawn:—the number of foreign and colonial Members is rapidly increasing.

As regards the work in which the Institute is engaged, it is eminently satisfactory to see the important place given to Scientific Research during the past two years, and the encouragement it receives from many governments. The progress of Science, in the development of scientific facts, is the surest mode of preventing that antagonism between the Book of Nature and the Book of Revelation which obtains when *scientific conjecture* takes the place of *accurate inquiry*.

When writing upon this subject in the Preface to the Fifth Volume of the *Journal* of the VICTORIA INSTITUTE, we quoted some valuable remarks by Professor G. Stokes, F.R.S., on the distinct provinces of Science and of Revelation, and Dr. W. B. Carpenter, F.R.S., when speaking as President of the British Association in 1872 (see page xiv., vol. vi.), saw occasion for uttering the warning which may well be repeated here:—"When Science, passing beyond its own limits, assumes the place of Theology, and sets up its own conception of the order of Nature, as a sufficient account of its cause, it is invading a province of thought, to which it has no claim."

F. PETRIE.

*Hon Sec. and Editor.*

31st December, 1874.

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## Objects of the Victoria Institute.

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- First.—To investigate fully and impartially the most important questions of Philosophy and Science, but more especially those that bear upon the great truths revealed in Holy Scripture, with the view of reconciling any apparent discrepancies between Christianity and Science.
- Second.—To associate men of Science and authors who have already been engaged in such investigations, and all others who may be interested in them, in order to strengthen their efforts by association; and by bringing together the results of such labours, after full discussion, in the printed Transactions of an Institution; to give greater force and influence to proofs and arguments which might be little known or even disregarded if put forward merely by individuals.
- Third.—To consider the mutual bearings of the various scientific conclusions arrived at in the several distinct branches into which Science is now divided, in order to get rid of contradictions and conflicting hypotheses, and thus promote the real advancement of true Science; and to examine and discuss all supposed scientific results with reference to final causes, and the more comprehensive and fundamental principles of Philosophy proper, based upon faith in the existence of one Eternal God, who in His wisdom created all things very good.
- Fourth.—To publish Papers read before the Society in furtherance of the above objects, along with full reports of the discussions thereon, in the form of a Journal, or as the Transactions of the Institute.
- Fifth.—When subjects have been fully discussed, to make the results known by means of Lectures of a more popular kind; and to publish such Lectures.
- Sixth.—To publish English translations of important foreign works of real scientific and philosophical value, especially those bearing upon the relation between the Scriptures and Science; and to co-operate with other philosophical societies at home and abroad, which are now or may hereafter be formed, in the interest of Scriptural truth and of real Science, and generally in furtherance of the objects of this Society.
- Seventh.—To found a Library and Reading Rooms for the use of the Members of the Institute, combining the principal advantages of a Literary Club.

## Terms of Membership, &c.

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The Objects of the Victoria Institute being of the highest importance both to Science and Religion, while they are such as have not been attempted to be attained by any previously-existing scientific society, it is anticipated that, when its establishment is known, it will receive the most liberal support by gifts and donations from friends, and be joined by large numbers of Members and Associates.

The annual subscription for Members is Two Guineas each, with One Guinea Entrance Donation.

The annual subscription for Associates is One Guinea each, without any Entrance Fee.

Life Members to pay Twenty Guineas; and Life Associates to pay Ten Guineas, respectively, in lieu of the above Annual Subscriptions.

Vice-Patrons (ladies or gentlemen) to pay not less than Sixty Guineas each, as a Donation to the funds of the Institute.

\*.\* All who join the Society as *Members* must be professedly Christians.

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\*.\* *Applications for admission, and general Correspondence should be addressed to the Honorary Secretary of the Institute.*

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\*.\* ALL ANNUAL SUBSCRIPTIONS BECOME DUE IN ADVANCE ON JANUARY 1ST IN EACH YEAR, AND IT IS PARTICULARLY REQUESTED THAT THEY MAY BE REGULARLY PAID TO THE "VICTORIA INSTITUTE'S" CREDIT, AT MESSRS. RANSOM'S, 1, PALL MALL EAST, S.W., OR REMITTED TO THE HONORARY TREASURER, W. N. WEST, ESQ., AT THE INSTITUTE'S OFFICE, 10, ADELPHI TERRACE, STRAND, LONDON, W.C. IN THE LATTER CASE CHEQUES SHOULD BE MADE PAYABLE TO THE "VICTORIA INSTITUTE, OR ORDER," AND CROSSED "RANSOM & Co.;" POST OFFICE ORDERS—ON THE CHIEF MONEY-ORDER OFFICE, LONDON—SHOULD BE MADE PAYABLE TO "W. N. WEST," AND CROSSED IN LIKE MANNER. (DONATIONS TO THE *Endowment Fund*, OR THE *Library Fund* MAY BE SENT IN A SIMILAR WAY.)

Any risk attendant on sending money by post will be avoided by Members and Associates giving their Bankers authority to pay the subscriptions, "for the Victoria Institute," to Messrs. Ransom & Co., Bankers, 1, Pall Mall East London, S.W. Forms for this purpose are furnished by the Institute.

## FORM OF BEQUEST.

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I give and bequeath to the Trustees or Trustee for the time being of the VICTORIA INSTITUTE, OR PHILOSOPHICAL SOCIETY OF GREAT BRITAIN, to be applied by them or him for the purposes of the said Society, the sum of £                    such sum to be wholly paid out of such part of my personal estate as may be lawfully applied to the purposes of charity, and in priority to all other legacies. And I declare that the receipt of the Trustees or Trustee for the time being of the said Society shall be a good discharge to my Executors for the said legacy.

# JOURNAL OF THE TRANSACTIONS

OF THE

## VICTORIA INSTITUTE,

OR

PHILOSOPHICAL SOCIETY OF GREAT BRITAIN.



ORDINARY MEETING, APRIL 7, 1873.

C. BROOKE, Esq., F.R.S., V.P., IN THE CHAIR.

The Minutes of the last meeting were read and confirmed, and the following Elections were announced :—

MEMBERS :—

Lieut.-Colonel A. W. Drayson, R.A., Professor of Military Drawing and Lecturer on Astronomy, at the Royal Woolwich Academy, 6, York Crescent, Woolwich.

Rev. H. Ross, Ph.D., &c., 59, Moor Lane, Lancaster.

ASSOCIATES :—

J. M. Collingham, Esq., Lincoln.

J. Fraser Corkran, Esq., 22, Gloucester Terrace Grove, South Kensington, S.W.

Rev. W. W. Rowley, M.A., Coombe Lodge, Weston-super-Mare.

A Paper on "Force" was then read by Professor J. Kirk. [The preparation of this essay for the press having been delayed, it cannot be inserted in the present part of the Transactions.]

## INTERMEDIATE MEETING, APRIL 21, 1873.

C. BROOKE, ESQ., F.R.S., V.P., IN THE CHAIR.

The Minutes of the last meeting were read and confirmed, and the following Elections were announced :—

ASSOCIATES :—

Rev. T. C. Beasley, M.A. (Cantab.), Vicarage, Saffron Walden,

G. Brown, Esq., M.D., Head Street, Colchester.

Also, the presentation of the following Books to the Library :—

- “Proceedings of the Royal Society.” Part 143. *From the Society.*
- “Proceedings of the Royal Institution.” Part 57. *From the Institution.*
- “Proceedings of the Royal United Service Institution.” Part 70.  
*From the Institution.*
- “The Darwinian Theory of the Transmutation of Species Examined.” By a  
Cambridge Graduate. 4 copies. *From J. E. Howard, Esq.*
- “Genesis and Geology.” By the Rev. G. Henslow, M.A. (2 copies.)  
*From the Author.*
- “The Inter-relations of Prayer, Providence, and Science.” By the Rev. J.  
M’Cann, D.D. *From the Author.*
- “The Identity of Israel.” By Dr. Protheroe Smith. *Ditto.*

A Paper “On the Argument of Design as Bearing upon Atheism.” By the Rev. G. Henslow, M.A., was then read by the Rev. J. H. Titcomb (the author being unable to be present by reason of ill-health). A discussion ensued, in which the Revs. J. W. Buckley, C. Graham, Sir W. T. Marsh Lushington Tilson, Bart., C. A. Row, J. H. Titcomb, Messrs. F. Clarkson, R. W. Dibdin, J. E. Howard, I. T. Prichard, and the Chairman took part, after which the meeting was adjourned.

## ORDINARY MEETING, MAY 6, 1873.

*Specially held at the House of the Society of Arts.*

The Right Hon. the EARL OF HARROWBY, K.G., IN THE CHAIR.

The Minutes of the last meeting were read and confirmed.

The HONORARY SECRETARY then read letters of regret from several who, having been specially invited to be present at the meeting, were unable to attend. He then said :—From the great publicity given to the fact that the Institute was about to hold this meeting, to which every leading geologist and palæontologist in the United Kingdom has received a special invitation,\* it must be apparent that this Society has but one object in view, namely, a full and impartial consideration of the subject.

Mr. W. D. Michell then read a Paper “On the so-called Flint Implements of the Drift,” illustrated both with numerous diagrams, showing the strata in which the flakes are found, their sizes, shapes, &c. ; and also by his own and three other large collections of flint implements and flint flakes, kindly lent by Professor Tennant, Mr. N. Whitley, and Mr. Borlase. Mr. J. Evans (now President of the Geological Society) also made a valuable addition to the exhibition by contributing several flint implements.

[It is much to be regretted that Mr. Michell's failing health prevented him from doing more than giving an imperfect outline of the arguments in his Paper, and even this with much difficulty. He did not place the MS. from which he read, in the hands of the Society, after the meeting ; hence it cannot be published. Mr. Michell never recovered, but died a few weeks afterwards, a martyr to that energy which characterized his life.]

Copies of the following paper by Mr. Whitley were circulated before and at the meeting, and, as in its earlier pages arguments are taken up similar to those enunciated by Mr. Michell, the loss to the Society is less than it would have been had not its author kindly permitted its publication in the Journal of the Institute.

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\* About 600 cards of invitation were issued to these and the general public.

*THE PALÆOLITHIC AGE EXAMINED.* By N. WHITLEY,  
C.E., *Hon. Sec. of the Royal Institution of Cornwall,*

INTRODUCTION.

THE most prominent characteristic of the present age is its great intellectual activity and power; and in no other line of thought has this peculiar feature been so fully manifested as in the rapid advance of scientific discovery, and in its practical application to the physical enjoyment and intellectual pleasure of human life: the man of fifty years surveying this progress feels as if he were a Methuselah in the ripe manhood of the gathered knowledge of five hundred years. But the pace is so hard, the competition for leadership so keen, that even in the sober realities of science, the imagination has often run ahead of the judgment; and theories have been built up on the slenderest fragments of unverified facts. To some extent this imperfect perception of the future must of necessity arise from the mode of scientific inquiry, where thought is pushed forward from the known into the dim region of the unknown. It has been notably so in the progress of geological discovery as it passed through all its various phases from the dreams of an Oriental cosmogony into the fixed principles of a noble science, on which it is now so firmly established by the labours of such men as Murchison, Prestwich, and Lyell.

The younger science of anthropology growing into early manhood, in its youthful energy is now rushing into the field with a courage, a power, and a recklessness of theory, as if it were resolved to storm all the garrisons of human thought, and force the dictum of the fiery spirits by whom it is officered on those who do not submit to its sway; and whom it delights to designate as the "lingering stragglers in the march of science," unable to "carry their vision backwards into the dim past," "and unconscious of the cogency of the evidence on which the great antiquity of man is founded."

This assumption of infallible truth and scornful rejection of all opposing evidence, cannot but clog and retard a branch of scientific inquiry which, if established, must ultimately be built on well-tested and ascertained facts. Science cannot be built on dogmatic assertions; it cannot rest on a faith which

relies on authority, but it must have the approval of the judgment to the facts, and the assent of the understanding to the arguments on which it is founded.

I purpose in the following short papers to examine the facts and arguments upon which the Palæolithic age is attempted to be established; and to give an abstract of the results of antiquarian and geological surveys made to this end, extending in time over a period of ten years, and in range from the Scilly Isles to Norfolk, from Belgium to the Somme, and to Pressigny-le-Grand.

At the outset it is necessary to define the term Palæolithic age, and I am content to abide by the definition of the period given by Sir John Lubbock in his *Pre-Historic Times*, p. 2, in which he describes it as "THAT OF THE DRIFT; when man shared the possession of Europe with the mammoth, the cave bear, the woolly-haired rhinoceros, and other extinct animals. This we may call the Palæolithic period."

Sir Charles Lyell, writing three years after and describing the Reindeer period of M. Lartet, to which the Caves of the Dordogne belong, says:—"This period may be considered as intermediate between the Neolithic and Palæolithic ages, but it has been classed provisionally by Sir J. Lubbock as Palæolithic." And Sir Charles further manifests a desire to include the cavern deposits in the first Stone age, when he says:—"Lastly we arrive at the still older monuments of the Palæolithic period, properly so called, which consist chiefly of unpolished stone instruments buried in ancient gravels and in the mud and stalagmite of caves." (*Principles of Geology*, vol. ii., 10th ed., p. 559.)

To admit the caverns into the Drift period would be to abandon all that has heretofore been said of the sequence of those deposits. In the description of the Reindeer period, given in *Reliquiæ Aquitanicæ*, p. 25, we read,—"Geologically a wide gap separates it from the Drift period." It would also class Neolithic relics and bronze celts\* with the Somme tools,—for both of the former are found in caves beneath the stalagmite. I therefore restrict the definition of the Palæolithic age properly so called, TO THE PERIOD OF THE DRIFT.

The time is now come when this subject can be fully and impartially investigated; it has been laid before us in great detail in the publications of our leading geologists, and in the journals of the Anthropological Institute; and time has been given for others to investigate the facts and to gather what to many appears to be conflicting evidence.

In pursuing this investigation I shall examine the facts and weigh the evidence on which the Palæolithic age at present rests, and give the results of my personal surveys of the Drift deposits of England and France, founding my arguments only on well-ascertained natural facts.

The first paper of the series will be on,—

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\* See the description of the Heathery Burn Cave in the *Geologist*, vol. v. p. 167.

THE DISTRIBUTION AND ORIGIN OF THE SHATTERED FLINTS AND FLINT  
FLAKES OF DEVON AND CORNWALL.

The ancient Palæozoic rocks of Devon and Cornwall, elevated and indurated by the eruption of five bosses of granite from Dartmoor to the Land's End, are thrust like a gauntleted fist far out into the Atlantic, unconnected and far removed from any of the secondary formations; and yet over the high ground of their western extremity, the Rev. John Buller, writing in 1842, mentions that flints are found on the surface of Carn Kenijack, and from thence to Tolpedn-Penwith, over a distance of five miles; and he suggests that they may have been brought there by the ancient Britons for the purpose of forming out of them arrow-heads, which he says, some of the broken fragments much resemble.\* Sir Henry de la Beche, in his geological survey of Cornwall and Devon,† describes the occurrence of flints in the "raised beaches" of the coast-line as "not of easy explanation."

During the past ten years numerous discoveries of apparently isolated nests of shattered flints, chiefly along the northern coast-line, have been made, and many papers have been written on these "*manufactories of flint weapons*," as they have been called; but further research has shown that these flakes are scattered over a wide area, and that in fact the "nests" form only a portion of a continuous sheet of scattered chalk flints which may be traced over very large portions of the country. This new aspect of the case is best illustrated by one now well-explored district.

Between the village of Croyde and Baggy Point (which forms the northern horn of Barnstaple Bay) the flakes are found abundantly in the subsoil at the mouth of a small transverse valley, and this flint-find was said to be the site of an ancient manufactory of flint implements. But it was soon seen that along the coast section the flints might be traced in the subsoil for at least half a mile; that on the exposed weather-beaten headland the soil had been weathered off, and there the flints were exposed on the surface; and even from the arable land of the hill top, especially after heavy rain, the same shattered flints might be gathered from the soil; and in this way they could be traced eastward through the parishes of Braunton, Heanton, and Pilton, to Barnstaple—a distance of nine miles. Nor was the trail lost there, for eight miles up the valley of the Taw at Bartridge Farm, the flakes were most numerous, and extended from the river up the slope of the hill to at least 200 feet above the valley; and still further up the Taw, these shattered flints were found at Colleton Barton, to be scattered over an area of 400 acres.

These statements are not founded on any superficial survey of the district, but on discoveries made during a period of many years in carrying out works

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\* *Statistical Account of the Parish of St. Just, in Penwith*, p. 15.

† p. 429.

of drainage, road-cuttings, and sea-embankments ; during which time hampers full of shattered flints were brought to me by the workmen, of which about 5 per cent. might be said to be typical flakes and cores more or less perfect, the remainder being crushed flints of undefinable forms. This trail of shattered flints may be roughly estimated to embrace an area of at least 200 square miles of country. It cannot surely be said that a few scattered savages required a manufactory of such a size for the shaping of their stone implements, and therefore it has been sometimes assumed that the widely-scattered flakes are the lost arrow-heads of the Palæolithic hunters ; but this fancy vanishes before the consideration that the small proportion of arrow-headed flakes to the larger mass of broken flints is everywhere nearly the same. Continuing the survey of the geographical position of the flakes, we find them scattered over most of the headlands from Morte Point to the Land's End, at Hartland, Budehaven, Stepper Point, and for three miles along the shore of Padstow Harbour, at Trevoise Head, Trevalga Island, Newquay Head, the Gannel, St. Agnes, St. Ives, and St. Just. On the south coast of Cornwall the flakes are rare, but they are abundant over a large portion of the table-land of the Lizard Peninsula. But the flakes are not confined to the coast-line : they have been found at three places on the granite plateau of Dartmoor from 1,200 to 1,400 feet above the sea ; on barren hills which have never been cultivated between Launceston and Bodmin ; by works of drainage on the high lands of Davidstow ; on the hills of Constantine ; and even on the uncultivated crofts of the Scilly Isles.

If we now compare these roughly-broken flints with the beautifully-formed, barbed, and delicately chipped flint arrow-heads of the Neolithic age, we are at once struck with the lack of evidence which they present of human workmanship. The larger portions are simply crushed and shattered pieces of flint : a diligent search would result in the finding of some rough untrimmed flakes ; and from the pick of the mass some thin, well-formed flakes of the arrow-headed type would be obtained, and it is on these alone, to the exclusion of the imperfect specimens, that the assumed evidence of their human manufacture rests. It has been said that the flint flakes and refuse chips of Croyde indicate the site of an ancient manufactory of flint arrow-heads and flake knives. I can discover no evidence in support of such an opinion, but, on the contrary, the evidence that the fractured flints are formed by natural causes appears abundant and conclusive.

1. There is a gradation in form, from the very roughly-fractured flint, so rude that it cannot be ascribed to human workmanship, up to the most perfectly-formed flake of the arrow-headed type.

2. There is a gradation in size, from a flake so minute that it could not possibly be used as a weapon, up to the full-size arrow and javelin heads.

3. The good and the bad are all mingled together in one chaotic mass. This pell-mell mixture of all kinds of flakes and broken flints is perfectly consistent with their being formed by natural causes, but utterly incompatible with their manufacture by man. The most degraded savage would not cast away his perfectly-formed implements with the refuse chips.

4. The flakes are the result of the natural fracture of the flint nodule. I gathered from a heap of flints undesignedly broken for the repair of the roads at Menchecourt, most perfect flint-flake knives, and long, thin, delicately formed "arrow-heads" of the most perfect forms. I have shattered flint-nodules branching in all directions, and all the fractures are longitudinal, and all the points run into the arrow-headed form. I have examined and studied the angular flint gravel of the south of England, the crushed and shattered flints of the Isle of Wight, of the North and South Downs, of the Norfolk drift, and the gravel-pits and surface flints of Belgium and France; and I find that everywhere the split and shattered flints have a natural tendency to run to the arrow-headed form with sharp cutting edges at the sides.

*Their Origin.*—It is often put forward as a strong conclusive argument in support of the human workmanship of the flakes, that they are found in places far removed from the natural home of flint in the chalk; and that they must therefore have been carried to their present sites by man. Thus M. Dupont infers that the flakes in the Belgium caverns were brought from the South of France, and indicate an ancient trade in flint between these countries, ignoring the fact that the flakes are abundant in the soil of Namur, and I have found them near Mons over the Loess in a stratum six inches thick, and scattered by denudation over the surface below. In like manner Sir C. Lyell, writing of the profusion of flakes in the Swiss lake-dwellings, infers that the flint "must have come from a distance, probably from the South of France." (*Antiquity of Man*, p. 20.) Again, the fact is overlooked that a broad band of cretaceous rocks passes along the south of Switzerland at the base of the Alps, and at the head of the valleys whose rivers feed the lakes, from whence these shattered flints and gravel have more probably been swept by denudation into the lakes below. These cretaceous beds are shown on the Geological Map of Europe by Murchison, and more fully in detail by the large Geological Map of Switzerland lately published, which shows that the N.W. shore of the lake of Neuchatel (where the flakes abound, and on which there are twelve lake-settlements) is formed of these flint-bearing beds. The same fanciful origin has been suggested for the flakes found at Croyde, but a more searching and comprehensive knowledge of their geological surroundings leads to a different and more scientific conclusion.

Along the whole coast-line of Devon and Cornwall are found patches of drift of which good sections are exposed by the beat of the waves in the lowlands of sheltered bays, and similar beds cap the cliff in more exposed situations. The bases of these beds contain boulders of foreign rocks which indicate their origin; at Croyde these drift-beds contain water-worn pebbles and boulders of granite, many varieties of trap, portions of basaltic columns with the angles rounded, and numerous rolled chalk flints; these drift-beds have been traced south-westward along the whole of the Cornish coast-line. I have further found them on the Scilly Isles, and this trail of flints may be traced over these barren islets to at least 100 feet above the present level of

the sea. Following the trail of this drift backwards to its origin, I have found it in South Wales from Tenby to Stackpole Warren, and picked up flint flakes on the summit of Caldy Island. Trimmer has described the well-known white limestone (indurated chalk) of Antrim in the drift of Caermarthenshire.\* Murchison has marked the flint drift along the western coast of Wales in his geological map; it has left its mark in large characters on the Isle of Man; it has coated the islets and shores of Strangford Lough, and the trail ends with the numerous and often-described "subsoil flakes" of Carrick-fergus and Larne.

On the eastern coast of Ireland we have the evidence of the late Professor Jukes that "chalk flints and pieces of hard Antrim chalk are found in the drift in the counties of Dublin and Wicklow, and along the whole eastern and southern coast of Ireland, at least as far as Ballycotton Bay, on the coast of Cork." (*Manual of Geology*, p. 675.)

The Antrim drift is distinguished by characters which cannot be mistaken: the indurated chalk known as the white limestone, the burnt flints which lie in a bed between the chalk and the basalt, and the basaltic columns themselves, tie up by a threefold cord, which cannot be easily broken, this peculiar drift to its native place in the disrupted chalk of Antrim.

It is important also to observe that these flakes are found in a true geological position, and form a well-defined stratum with other broken stones in the subsoil below the surface-soil: this is so generally acknowledged that they are now known as "subsoil flakes"; and this is not only the case in Ireland and Devon, but it is notably so at Cissbury-hill, at Spiennes near Mons, and at Pressigny le Grand, where they are found by cart-loads, in a stratum two feet below the surface of the soil; thus indicating a geological rather than an antiquarian origin.

In some exposed parts of the Cornish coast "bundles of flakes" are found on the surface: thus, at Trevalga Head the beat of the sea-spray has weathered off the soil, and the exposed flakes and broken pieces of quartz thickly cover the ground, and indicate that the same natural cause which broke the quartz broke the flints:

It is futile to argue against the old surmise that the flints have been brought by vessels in ballast and spread with chalk over the land for manure, for they are now seen embedded in contorted strata of drift in cliff sections, and scattered over infertile crofts, and barren moors which have never been cultivated or manured.

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\* "Among the most remarkable of these (fragments) is the hard chalk of the county of Antrim, of which a continuous stream has been traced in Ireland, from its source as far south as Wexford. The tail of this stream of Antrim detritus appears to have caught the Welsh coast, for we have found it in the Boulderclay of the extreme point of Caernarvonshire, and much further to the south, between Newport and St. David's Head, in South Wales." (*Jour. of Royal Agricultural Soc.*, vol. xii. p. 463.)

But it may yet be asked, if these flints were not broken by the hand of man, how were the most perfect of the flakes produced? This question may not admit at present of a perfectly satisfactory answer. Yet there are well-known forces in nature capable of producing all the phenomena which we have described. The finishing touches of the moulding and carving of our hills and valleys were undoubtedly done by glacial action; the planing, rasping, and crushing power of a deep mantle of land-ice pushing its tortuous way to the sea, would, on the assumption that a crushed flint occasionally breaks into flakes, produce all the forms of flakes and cores which we find: nor is this a mere assumption, it has been tested by actual experiment. My contractor for the formation of new roads at Eastbourne prepares the metalting by crushing large nodules of flint with "Blake's patent stone-breaker," in which a massive cast-iron jaw is worked by a steam-engine; the machine breaks the flints as fast as two men can feed it, and from the crushed nodules I have picked out well-formed flakes of all sizes showing the "bulb of percussion" and "wave markings" on the fractured surface, having a conchoidal face on one side and an angular one on the other, and terminating in a bayonet point; and also "scrapers" and "cores." And these, which cannot be distinguished in form from the so-called implements of the same type of the "Palæolithic age," bear the same proportion to the whole of the mass, as the flakes and cores bear to the rough flints in the various coast-finds.

The evidence which I have brought forward appears to justify the conclusion that the rough, unused, and generally minute flakes are of natural origin; and I place with confidence these geological facts against the assumption of the fashionable "flint-knife" theory of the day.

#### CORES, DISCS, AND SCRAPERS.

A block of flint showing the loss of flakes from its sides, has been called a core; and when all the available flakes have been removed "by skilfully-dealt blows," the nucleus is supposed to have been thrown away as useless.

Some of these cores show the loss of one flake only, others of several flakes from one side and a rough shattery fracture on the other side, but the more perfect and typical core is said to have been produced by the flint nodule being first broken transversely, and the flakes afterwards struck off on every side, leaving the core in the form of a small basaltic column.

It is evident that the claim of these cores to be of human workmanship must stand or fall with the human manufacture of the flakes, and the only interest attached to them lies in the evidence which they furnish on this point.

I have lately inspected a gun-flint manufactory at Brandon, and marked the manner in which the flakes are struck off from a block of flint, and the character of the core left and rejected by the flint-knappers. The block is first broken transversely, and in such a manner as to leave a plane surface, and the flakes are then with a heavy hammer struck off by skilfully dealt

blows on the edge of the transverse fracture : these flakes are very perfect, with a uniformity of size and shape adapted to the purpose for which they are designed ; they are generally about  $3\frac{1}{2}$  inches long, the core being of the same length.

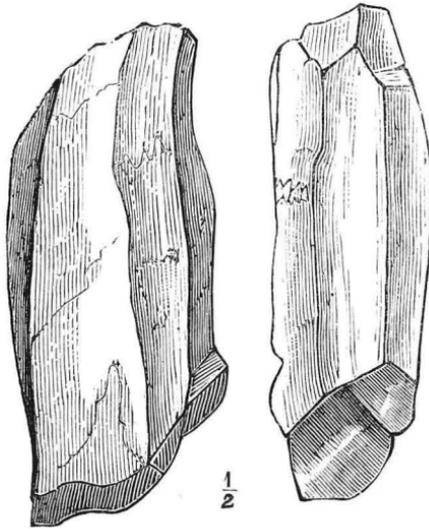
It is obvious to an observer that this uniformity of size and perfection of form is the result of intention and design, and is produced with the greatest ease and certainty. But when we contrast these hand-made products with the subsoil flakes and cores, we find in both these evidences of design wanting. The cores, in particular, are in some instances so minute as to be perfectly useless in producing any implement which could be of use to man ; so minute that they could not have been held in the hand or even between the fingers in order to strike off a flake, as the fingers must have been bruised by the blow rather than the flint ; but this difficulty is met by the assumption, without a tittle of evidence, "that some kind of punch must have been used, instead of the blows being administered directly by a hammer," and it is added, "we have no conclusive evidence for what purpose such minute flakes were used." (*Evans on the Stone Age*, p. 249.)

On the chalk-hills of Yorkshire these small cores abound, and in India, near Jubbulpore, they are found in still greater abundance ; none of these Indian cores exceed two inches in length, more commonly they are from an inch to an inch and a quarter long, and some are not more than half an inch in length. (*Proceedings of the Society of Antiquaries*, vol. iii., n.s., p. 41.) On one of these cores, not larger than an acorn, being half an inch in diameter and three-quarters of an inch in length, are not less than fourteen facets—thus the average size of the flakes struck off would be less than half an inch in length, and about one-tenth of an inch in width ; and even from these small cores smaller flakes must have been produced, as the facets occasionally cross each other, and in some cases at right angles. Is it rational to infer that such minute implements could have been used by man, and that they were in fact so valuable as to have been made with the greatest care and skill with the aid of a punch ? On the other hand, the cores found at Pressigny are from nine to twelve inches long, and so numerous that they may be gathered by cart-loads. Through the courtesy of Dr. Leveillé, of Grand Pressigny, I was shown the shelves of several rooms in his house loaded with such cores, and side by side they bordered the numerous walks of his garden for distances which I could not spare time to inspect.

The subsoil cores are also rude and rugged in the extreme, and the facets are of all sizes, and running in all directions ; in these respects they further differ from those made by the hand of man at Brandon, and the evidence of intention and design is wanting.

But it has been contended that each facet must have been the result of a separate blow ; this is not necessarily the case, for I have cores with from three to five facets on each, formed by one unintellectual blow from Blake's stone-breaker. I discovered near Beachy Head, ten feet deep in drift gravel, and resting immediately on the chalk, a large flint broken *in situ*,

and on gently removing it from its bed, I picked out of the shattered pieces two well-formed cores, each having five facets four inches in length. These cores speak for themselves, and confirm the evidence before produced of the natural formation of the flakes.



*Discs.*—These circular flints are the “sling-stones” of Sir William Wilde and Nilsson, and the “discoidal implements” of Mr. Stevens, who describes them as being nearly circular and coarsely worked, and brought to an edge all round, and considers that they may have been used as missiles. Of these so-called implements the manner of their formation may be readily discovered by common-sense observation of the mode of fracture of the flints on the surface of the ground on the chalk-hills. On a considerable number of surface flints, cup-like cavities are formed on their face perfectly circular in shape, not larger than a sixpence, and often so numerous and close together as to cover the whole of the surface of the flint. In many of these cups the white patina and the discoloration by time is much greater than in others; in some instances it is altogether wanting, and in others the fracture is as fresh as if just broken. Here we have an evidence of age, and an indication that the cups were formed at various and distinct periods of time. The small discs corresponding with the cavities may often be picked up in considerable numbers, and I have found many of them in the ochreous flint gravel which coats the footpaths around Redhill railway-station. The discs also vary in size from that of the smallest button to the largest watch, and some few I have found in the valley of the Little Ouse from four to six inches in diameter, some with the fracture as fresh as if broken yesterday; and the circular cavities or casts from which the discs were dislodged are there also found on

the soil, with various depths of patina on their concave surfaces. On Thetford Warren I found what would be described as an ovate implement: it was a simple disc with one diameter somewhat longer than the other, and roughly chipped by being battered on the edges in a *mêlée* of gravel, for the wave-markings distinctly indicate that the blows were delivered on the rim, which was thus reduced from a cutting to a blunt edge, and unfitted for any fancied Palæolithic purpose.

It is generally admitted that the "pitting," as it has been called, on flints is due to natural causes, and both Mr. Rose,\* F.G.S., and Mr. Hughes,† F.G.S., have attributed these cup-like cavities to the effects of frost; and Mr. Hughes goes on to show that the naturally chipped flint is so like what he considers the human implement that he cannot distinguish between them. A common-sense view of the many discs of flint found on the soil, and of the perfect cavities from which they were produced, leads irresistibly to the conclusion that they result from natural agency.

It is difficult to understand why Mr. Evans classes discoidal implements with those of the drift,‡ for they are truly surface flints, and are placed by other antiquaries in the Neolithic age.

*Scrapers.*—These implements, according to Mr. Evans, occur both in the Neolithic and in the Palæolithic age, and are described by him as being of the following forms:—"Horse-shoe Scraper," "Kite Scraper," "Discoidal Scraper," "Oyster-shell Scraper," "Spoon-shaped Scraper," "Duck's-bill Scraper," "Double-ended Scraper," "Hollow Scraper," "Ear-Scraper," "Straight Scraper," "Side Scraper," and "Scraper-like forms." Mr. Evans further says that "Scrapers are very abundant in the French caves . . . and are not wanting in Kent's Cavern and in other British caves. They are, however, of very rare occurrence in the river drift, and when found are hardly ever trimmed to so regular and neatly chipped a segmental edge as those either from the surface or the caves. . . . They appear to have been held in the hand and used in some cases for cutting or chopping, and in others for scraping." (*Stone Implements*, p. 563.) Several of these multi-form implements are figured to assist our comprehension; of one it is said "to have been somewhat worn away by use, whether as a saw or scraping tool it is difficult to say." Another form of "implement" is classed by Mr. Evans as a *scraper*, figured and termed by Sir John Lubbock in his *Pre-Historic Times* as a *knife*, and described by Sir Edward Belcher as a *plane*.§

With great respect I must leave this undefinable form of "implement," this undefined evidence of use, to speak for itself; the multitude of forms I cannot grasp, the Babel of their tongues I cannot understand. I give it up in despair; if any man can receive it, let him receive it.

\* *Proceedings of Geologists' Association*, No. v.

† *Geological Repertory*, vol. ii, p. 128.

‡ *Ancient Stone Implements*, p. 567,

§ *Ibid.*, p. 269.

And now let me make an admission to avoid a misconception. It is not my contention that a stone has never been used as a scraper; that a disc has never been hurled as a sling-stone; that a flint-flake has never been used as a knife, or never manufactured by man: for both written history and archaeological research testify to the contrary. But my contention is, that the shattered flints and simple flakes found in the soil, and more abundantly in the sub-soil, have been formed by natural causes, and unless the so-called implements which have been picked out from the mass of these shattered flints bear other and distinct marks of having been made or used by man, they afford no proof whatever of his workmanship or presence.

I will take an illustration from ancient history. In a journey through the desert of Sinai, the wife of Moses in her haste *took* a "sharp stone" (a flake?) to circumcise her son, and afterwards it is said that Joshua "*made* him sharp knives" (in the margin, knives of flints) for the performance of the same rite; and at his burial these knives were placed in his tomb. The late geological survey of the Peninsula of Sinai shows a large development of cretaceous rocks near the line of the journey from Sinai to Egypt, where natural flint-flakes are abundantly scattered over the surface of the ground, of which a sample may be seen at the Jernyn-street Museum. Hence it is highly probable that the natural flake was used by Zipporah, and the flake-knife manufactured by order of Joshua.

#### THE "IMPLEMENTS" OF THE DRIFT.

IT is not too much to assume that there are elements of weakness about the claim of the flakes to be Implements, which lead some of their stoutest defenders at times to express their doubts, and confirm others in absolute disbelief; and that there is a rebound of opinion from the dogmatic assertion that "a flint-flake is to an antiquary as sure a trace of man as the footprint in the sand was to Robinson Crusoe." Thus, Mr. Hughes, F.G.S., says, "We must allow that flakes with bulbs of percussion, or even flints with faces due to several different blows, are not in *themselves* sufficient evidence of the existence of man."\* The late Hon. Sec. of the Cambrian Archæological Association has thus recorded his opinion in the Transactions: "I had long ago come to the totally independent opinion that these so-called implements are not made by man, but have resulted from natural operations." Mr. Godwin-Austin, F.G.S., refers to the flakes at the base of the glacial drift of Belgium as being "naturally formed" (*Journal of Geo. Soc.*, Aug. 1866, p. 249); and even Mr. Evans says, "Mere flakes of flint, however analogous to what we know to have been made by human art, can never be accepted as conclusive evidence of the work of man." (*Archæologia*, vol. xxxviii. p. 11.)

But further, the distinction between "High" and "Low-level" gravel,

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\* *Geological Repertory*, vol. ii. p. 131.

and the long period of time supposed to have intervened between the deposition of these beds, was shown by myself in 1865 to be founded on imperfect observations, and untenable;\* and in 1868 Mr. Alfred Tylor, F.G.S., in an exhaustive paper on the Amiens Gravel,† has so completely disproved the distinction, that this corps of the defending army has been ordered to the rear.

Thus the outworks are slowly giving way before more detailed investigation, but the citadel on the Somme remains in full strength where the vigilant sentries keep watch and ward. With this fortress Palæolithic man stands or falls. If the "tools" of the Somme type are of human workmanship, then this fortress is placed on an imperishable basis; but if the assumed evidence of design on the flints will not bear the test of honest criticism founded on diligent research, then this citadel on the Somme must be regarded as an imitation ruin, with which modern landowners fancifully decorate their parks, and is distinguished by the name of a "Folly."

The simple issue to be tried is, as Sir John Lubbock clearly puts it, "Are the so-called flint implements of human workmanship?" and this proposition, which Sir John undertakes to prove (*Pre-Historic Times*, p. 276), he does not support by a tittle of evidence, but he does prove convincingly that the flints are found in undisturbed gravel; that they have marks of age on their surfaces by which the genuine implements can be known from forgeries; and then Sir John assumes that he has proved his case, and says, "On this point, therefore, no evidence could be more conclusive."

This is a mistake of the question. *It is proved* that the flint is found deep in the gravel-beds, which no one who has inspected the beds can doubt; but it is *not proved* that the flint has been formed into an implement by man. The zeal of the antiquary has in this argument clouded the judgment of the scholar. It must also be stated that the accomplished geologist, Sir C. Lyell, has fallen into the same argumentative mistake; he says, "As much doubt has been cast on the question whether the so-called flint hatchets have really been shaped by the hands of man, it will be desirable to begin by satisfying the reader's mind on that point." (*Ant. of Man*, 1st ed., p. 112.) But in the following pages this vital point is not discussed, and no evidence whatever in reference to it is given; "the genuineness of the implement" is inferred from the "vitreous gloss," the dendritic markings which only indicate age are figured, and the subject is closed by a quotation from Professor Ramsay, who had written: "For more than twenty years, like others of my craft, I have daily handled stones, whether fashioned by nature or art; and the flint hatchets of Amiens and Abbeville seem to me as clearly works of art as any Sheffield whittle."

I will put quotation against quotation. "Wherever," says Hallam, "obsequious reverence is substituted for bold inquiry, truth, if she is not already

\* *Flint Implements from Drift not Authentic*, p. 31.

† *Journal of Geological Soc.*, vol. xxiv. p. 103.

at hand, will never be attained." If the two inquirers above named have thus failed in their logic, there is at least some foundation for the words of Dr. Carpenter, that "no logical proof can be adduced that the peculiar shapes of these flints were given to them by human hands." The leading advocates for the "Implements" have failed on this point of their case. I will now show cause against the human manufacture of the so-called tools. My arguments naturally divide themselves into two parts—the evidence from the flints themselves, and the collateral evidence of their surroundings; and in this inquiry I shall follow the sound canon of scientific criticism, of judging the unknown by the known.

Let the flints speak.

1st. *The Palæolithic implements are all of flint*, and in this respect they differ from the recognized stone tools of the Neolithic age, which are not only made of flint, but also of "serpentine, greenstone, granular-greenstone, indurated claystone, trap, quartz, syenite, schistus, yellow hornstone or chert, granular porphyry, siliceous schist, serpentine or jade." (*Jour. of Brit. Arch. Assoc.*, vol. iii. p. 127.) Professor Nilsson has put this fact forward in still greater detail, and adds, "From all this we come to the conclusion that in Scandinavia, as in the South Sea Islands, the savage did not confine himself to one single material for his implements, but had resort to any suitable substance that he could obtain." (*The Stone Age*, p. 101.) But it seems that Palæolithic man would not allow himself any choice of material—he would have flint or no hatchet; but this is contrary to all we know of the usages of savages, of which a good illustration may be taken from the implements found in the north of Ireland, where flint is naturally broken into knives and arrow-heads; but even here, we learn from the catalogue of the Museum of the Royal Irish Academy, that the majority of the Neolithic implements were made of greenstone, basalt, trap, and hornblende rock. I put this known fact of what man really did, against the fancy of what he was supposed to do.

2nd. *The "implements" are all of one type.*—This does not refer to size, for the "hatchets" vary in length from two to ten inches; nor to finish, for many of them are very roughly chipped; but to a characteristic identity of form which pervades these chipped flints. Mr. Flower considers that there are fifteen or sixteen distinct types; Mr. Evans divides them into eight varieties, all duly named, and then adds, "I am far more ready to think that only two main divisions can be established, though even these may be said to shade off into each other." But, though of all sizes and various forms, they constitute a type totally and entirely distinct from any known implements ever used by man. This of course raises a strong presumptive evidence against their being implements at all.

But this type is so distinct, and the implements, wherever found, bear its impress so completely, that it has been inferred that savage man made them by instinct, as the bird builds its nest, and the bée its cell: there is, however, a more rational interpretation of this universal similarity of type. The tools made by man to supply his wants show great variations of constructive

ingenuity. In the Museum of the Royal Irish Academy there are no less than 688 bronze celts, and they all vary in make, and Sir J. Lubbock says, "Moreover it is a very remarkable fact, especially when we consider the great, I might say the immense, number of bronze celts which are found, that scarcely two of them have been cast in the same mould. (*Prehistoric Times*, p. 166.) On the contrary, crystalline rocks break by nature into the same forms wherever found : thus the similarity of type in the drift flints is not a characteristic of the work of man, but it is of the work of nature.

3rd. *The Drift implements show no marks of having been used by man.*—It is supposed that some of these implements were used as weapons both of war and the chase, others to grub up roots, to cut down trees, to scoop out canoes, to cut holes in the ice, as wedges for splitting wood, and for grubbing and tilling the ground ; in fact, as savages using stone implements in any age must have used them to supply their wants, the evidence of use impressed on the flints must therefore have been of much the same character in all ages.

The cutting edge of the flakes generally shows the natural serrated fracture of the flint, and only in one instance have I found a flake ground into a chisel-like form at the end and polished by use ; this was, however, a surface implement.

On the soil at the west of Menchecourt village, I found a flint celt of the true Stone age ; it had been ground into form, but the point was worn back by use, and on it was a long polished cavity about the size of a quill, as if it had been much used in rubbing a strip of leather into a rounded thong.

After a detailed review of the Scandinavian tools, Nilsson says, "These facts show that the above-mentioned stone objects have been employed as tools in everyday use, and that they have, while being so used, become worn, resharpened, and broken, and that the fragments have been made into other kinds of tools." (*The Stone Age*, p. 90.)

Most of the drift "tools," on the contrary, have their edges so sharp that they show no marks of use, and it is then inferred that there must have been a manufactory on the spot. Others have their edges worn by being rolled in a river's bed, or battered by the mass of gravel in which they are found. I obtained from the gravel-pits of the Somme thirty "implements," and in no case were the edges ground or polished, or bore any marks of having been used for any purpose whatever ; where the point was sharp from fracture, the edges at the sides were equally sharp from the same cause, and some of the specimens, partly rounded by being rolled in water, had their edges worn precisely to the same extent as the points, and the edges of all the split contiguous flints presented the same appearance.

I have inspected a very large number of the Drift "tools," perhaps 1,000, and I say advisedly, that I have not seen one bearing the same indubitable marks of use as characterize the true stone implements of the Neolithic age, nor do I find in any of the various scientific journals mention made of any such evidence of use. Sir Charles Lyell does indeed venture to suggest that

the rounded angles of some of the implements may have been occasioned by use, but he qualifies his language in a manner due to his high position when he says, "Out of more than 100 flint instruments which I obtained at St. Acheul, not a few had their edges more or less fractured or worn, either by use as instruments before they were buried in the gravel, or by being rolled in the river's bed." (*Antiquity of Man*, p. 113.) And Mr. Evans expresses his doubts in much the same manner on the individual specimens; of one he says, "its angles are slightly waterworn, and the edges worn away, either by friction among other stones in the gravel, or by use" (*Stone Implements* p. 485); and of others, "They bear evident marks of abrasion and bruising at the ends, such as may have resulted from their use as hammer-stones" (p. 489); and again, "Many appear to have their edges chipped by use" (p. 526). And on such dubious marks of use, we find in his recent work the oft-reiterated assertion, that the Drift implements show marks of wear. It is a sufficient answer to this sort of evidence to reply that the roughly fractured gravel in which these symmetrical chipped flints are embedded, bears the same marks of wear, of bruising, and chipping, as are found on the assumed implements.

The so-called worked flints of Pressigny are so abundant that they impede the cultivation of the land; they abound in the soil in every direction, and the concurrent testimony of many observers is, that notwithstanding their wonderful abundance, they show no marks of having been used by man.\*

4. *Their Number*.—Of the flint tools at Hoxne, Mr. Frere said, "The number of them was so great that the man who carried on the brick-field told me that before he was aware of their being objects of curiosity, he had emptied basketfuls of them into the ruts of the adjoining road." At the newly discovered finds on the Little Ouse, hundreds are procured from a single gravel-pit, and these pits dot the sides of the valley for eight or ten miles. At Abbeville, M. de Perthes writes, "Any one visiting me may count them by thousands, and yet I have kept only those which presented some interest. From those beds which I have called "Celtic," I have seen them drawn in barrows to metal the neighbouring roads—one would have thought a shower of them had fallen from the sky." At St. Acheul, in about three acres of land, certainly more than 3,000 tools have been exhumed, which is equal to 640,000 in a square mile, and as these beds are now proved to extend more than twenty square miles along the valley of the Somme, if equally productive, there must be 12,800,000 in this small area; the present population of France is less than 200 to a square mile, and these implements are assumed to have been lost by a race of hunters, when from the nature of their pursuits the country could have sustained only a very sparse population. It has been calculated that 800 acres of hunting-ground produce only as much food as half an acre of arable land, and on this

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\* Mr. Evans says, "At Pressigny, so far as I could see, the large *livres de beurre* show no sign of use or wear." (*Brit. Association*, 1865.)

basis the ratio of lost axes to the savage population would be as six millions to one.

I have thus given in a condensed form the evidence of the flints themselves ; it remains to produce the testimony of their belongings.

#### THE DRIFT "IMPLEMENTS,"—THEIR SURROUNDINGS.

If we should happen to find on the surface of a chalk down a rough flint which appeared to have been used as a strike-light, the evidence of its association with man at best would be but dubious and uncertain ; if we found the same rough flint in a kist-vaen, the probability would be much greater that such had been its use ; but if we found it in a hut-circle, carefully placed with other recognised tools of man, then there would be the highest probability that the flint had been used as an implement to minister to man's wants.

From this point of view, what is the nature and value of the evidence deducible from the surroundings of the Drift "implements,"—does it indicate their artificial character, or does it testify to their natural formation ? This is the case we now have to try.

1. *Both the flakes and the "implements" are in a section, found in true geological stratum.*—In Cornwall and Devon, at the base of the soil, and mixed with the top of the more clayey subsoil, there is generally found a thin layer of angular crushed stones, not strictly related to the rock below, but derived in part from it, and in part drifted ; and this is more especially the case where veins of quartz abound, for here the general denudation of the country has carried away the softer materials, but the hard crystalline quartz has resisted the abrasion, and has been left scattered over the then surface of the ground before the true soil was deposited ; which is, as Mr. Trimmer correctly describes it, "the warp of the Drift." The crushed quartz is especially plentiful on the barren hills of Cornwall, and in reclaiming this down-land the Cornish farmer trenches it deeply, digs out the "cold spar," and piles it up by the roads and fences, in the same manner as the French cultivator at Pressigny carts off the flakes and cores. The subsoil flakes occupy the same geological position as this broken quartz, and indeed they both are often mixed together in the same bed, and this pell-mell mixture of the crushed fragments is very observable on the projecting headlands on the north coast of Cornwall. At Trevalga Head, the powerful beat of the Atlantic spray has weathered off the thin soil and left the pieces of quartz and the flakes of flint mingled in one mass on the surface. On the inland rugged granite moors, up to the time of the introduction of lucifer-matches, the Cornish tinner was in the habit of picking out of the subsoil the flint flakes as strike-lights for his pipe. I will only further mention that at Cissbury Hill, Pressigny le Grand, and Spiennes, the flakes lie in a thicker stratum, and their geological belongings are yet more obvious.

Turning now to the so-called axes of the Somme type, we find their

geological horizon in the Drift most clearly defined in the sections of the gravel-pits at St. Acheul; there the "implements" lie at the bottom of the bed, mingled with angular flint gravel, the whole having a general uniformity of size, conformable with their geological deposition. It is obvious at a glance, that the angular gravel and the implements must be referred to the same common origin: they are similar in their nature, in the colour and depth of the patina, in the amount of wear from being rolled in water, and in the character of the chipping on their faces; and all their antecedents are geological, and not antiquarian; and the unquestionable inference is, that they were lodged in the gravel by natural causes, perfectly irrespective of the will of man. It is, in fact, so obvious that they must have had a geological origin, that to bridge over the difficulty it has been surmised (and on this subject there is no end of surmising) that the "implements" have been swept away from ancient Palæolithic villages by land floods, and deposited in their present geological position. This fancy, no doubt, evades the full force of the geological argument, but it places the evidence of the origin of the "implements" beyond the reach of scientific inquiry, and builds the Palæolithic age on an invisible foundation, which I need not attempt to overthrow.

Again, it has been surmised that, from the great abundance of the "implements," there must have been a manufacture of them on the spot. Of this we know nothing—the proof lies beyond human ken and scientific research, —but this we do know, that whoever built the supposed manufactory, the storehouse in which they were lodged was undoubtedly built by the hand of Nature.

2. *Their geographical distribution.*—The home of the entire flint nodule is in the upper chalk, and the home of the so-called implement is in the angular flint-gravel and flint-drift; their paternity is geological, and this relationship is so close and intimate that it has never been broken. Thus the flakes of the north of Ireland adhere closely (except where drifted) to the green ribbon indicating the chalk, and which encircles on the geological map the basalt of Antrim. The instructive geological map of Europe, by Sir Roderick Murchison, shows us that the Somme drains a large *cretaceous* district, that Hoxne, Bury St. Edmund's, and Brandon, are in the middle of a *chalk* plateau, that the beach at Herne Bay and the Reculvers is bounded by a *chalk* cliff, that Fimber is in the middle of the *chalk* district of Yorkshire, that Fisherton is at the foot of the *chalk* plain of Salisbury; and it is well known that all the valley gravels in which the "implements" have been found, are mainly composed of *flint detritus*. Nor can we stop here; the caverns of the Dordogne, of Sicily, and the site of the flint flakes from Syria and Arabia Petræa, are all intimately connected with *cretaceous* formations. This connection of the geographical distribution of the implements with geological structure has been pointed out in greater detail by the Treasurer of the Anthropological Institute, Mr. Flower, who says: "It is a remarkable circumstance, in relation to these deposits, that they occur only within a comparatively limited area. No true Drift implement has, I believe, ever been found in countries lying north of Great Britain; nor in

Great Britain have they been found to the north-west of a line drawn from the Severn to the Wash in Norfolk—a distance of two hundred miles, and in the direct line of the Lias escarpment ;” and he further adds the suggestive fact, “It is worthy of remark that the line of demarcation between the Drift-implement districts and those destitute of them, nearly corresponds with the line which divides the boulder-clay districts, from those destitute of boulder-clay. (*Jour. of Anthropol. Inst.*, Jan. 1872, p. 284.)

On the other hand, *far from the chalk*, on the ancient rocks of Norway and Sweden, there are no Palæolithic tools ; the Museum of “Copenhagen contains more than 10,000 polished stone axes and other implements of stone, and that of Stockholm not fewer than 15,000” ; “but the Palæolithic types are absolutely unknown there.”\* The same kind of evidence is yet more conclusively derived from the ancient valley gravels of Cornwall ; these stanniferous gravel-beds have been thoroughly explored through at least a period of 2,000 years, in search of the “stream-tin” which they contain, and yet not one “tool” of the true Drift type has ever been found in them. Is it conceivable that Palæolithic man selected only as his dwelling-place the dry and thirsty lands of the chalk-wolds, where no water is ; that he so loved the bare and barren sands which now constitute the rabbit warrens of West Norfolk, as to leave his weapons there by thousands ; and that he abhorred to dwell in the rich valleys of the new red sandstone, or in the “golden valleys” at the foot of the Oolite escarpment, where no such relics of his presence can now be found ; or is it not more rational to infer that this close relationship of the geographical distribution of the “implements” to geological structure is the result alone of natural causes ?

3. *No relics of man are found in the Drift with the so-called Implements.*—Wherever man has been known to have existed, even in his most degraded state, there the evidences of his former presence are multiform. The people of the ancient lake-dwellings of Switzerland, in addition to their stone implements, left behind them the relics of their pottery, their food, their raiment, their ornaments, their habitations, and indications of their habits and pursuits ; but when we turn from these abundant evidences of man’s presence, to the consideration of the evidence presented by the Drift beds, we find roughly-chipped flints, and these alone ; not a bone of man’s frame, not a shred of his clothing, not a fragment of his pottery, not a trace of his habitation, or any indication of his works or pursuits : nothing but roughly-chipped flints dignified by the name of axes, and unlike in form and type any implements ever known to have been used by man ; and this form passes by such insensible gradations into the other forms of the rough angular gravel in which they are embedded, that the assumed evidence of design becomes obscured and obliterated. In the whole history of inductive science it would be difficult again to find a case in which so large a superstructure was attempted to be built on so slender a foundation.

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\* Sir John Lubbock’s *Introduction to Nilsson’s Stone Age*, p. xxiv.

It may, however, be said that other relics of man have been found ; that there is the testimony of the human jaw discovered by Boucher de Perthes deep in the Abbeville gravel. I need not stay to expose this fraud : all the scientific evidence is against the antiquity of the bone ; it has been abandoned as an unreliable relic by those who have examined the facts ; and it is now only held to by a few enthusiastic antiquaries with that fantastic faith—

“ which once made fast

To some dear falsehood, hugs it to the last.”

But there is the more important statement, supported by the authority of a few great names, that in the gravel-pits of St. Acheul, the beads which formed the necklaces of these ancient people have been discovered. From this spot I obtained seventy-two specimens of these so-called “ beads ” ; some of them had slight indentations on their surfaces, in others the perforations extended much deeper, and the more perfect specimens had a hole completely through their centre ; these, when arranged according to their sizes, and placed on a string, form a very imposing supposititious necklace. The aid of science has been called in to determine the origin of these subglobular perforated bodies : they have been examined by Professor Rupert Jones and Dr. Carpenter, and pronounced by them to be fossil organisms of the chalk. Professor Jones expresses such a clear and decided opinion as to their origin, that it puts an end to all controversy ; he says they “ occur in Bedfordshire, and at St. Acheul ; I have to state that, as everybody knows, they have been derived from the chalk, in which similar fossils are abundantly found, either in the perforated condition, or solid, or with a more or less shallow hole in their substance. . . . The concavity of the typical variety becomes in many of the globular forms a small cavity, a hole, or even a neat cylindrical perforation. The last feature may be due, perhaps, to the *Orbitolina* having grown around a smooth stem of seaweed. At all events *such perforated specimens are natural*, and as abundant in the chalk as those of different conformations. . . . I may add that the imperforate *Orbitolina* occur in the gravels just as much as the perforate. Also that the perforation of the non-drifted specimens in the chalk is often just as smooth and straight as if artificial ; the interior surface is not worn, however, but consists of a natural structure of the organism.” (*The Geologist*, vol. v. p. 235.)

Thus these so-called beads are undoubtedly natural products, and they afford no proof whatever of the early existence of man ; they must be classed with such relics as St. Hilda's snakes, St. Patrick's loaves, and St. Cuthbert's beads ; and to arrange them on a string in the form of a necklace, and dangle them before the eyes of the uninformed as a relic and ornament of Palæolithic man, is to drag science back into the ignorance and superstition of the dark ages. It is impossible for any scientific man to recognize in these globular fossils the evidence of human manufacture.

Thus we arrive at the conclusion that all the surroundings of the “ implements ” testify to their natural production, and that their origin is geological and not antiquarian.

I have now brought this examination to a close, having endeavoured to present the evidence which has determined my own opinion in as clear a light, and in as fair a manner as possible. It cannot be thrust aside or ignored as irrelevant. It is not answered by the reiterated cry that "the flint hatchets of Amiens and Abbeville are as clearly works of art as any Sheffield whittle." It is in vain for author after author to write whole pages to prove the "authenticity" and "genuineness" of the "implements," when such misleading words are found only to refer to the discovery of the flint in the gravel, and not to the human manufacture of the tool. I have shown by the evidence of the flints themselves, and by their relationship to the surrounding gravel, that their origin is natural, and not artificial.

"To the solid ground  
Of nature trusts the mind which builds for aye."

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At the conclusion of Mr. Michell's paper,

The CHAIRMAN said,—It is now my duty to move a vote of thanks to Mr. Michell for his paper, and to mention that any here are at liberty to join in the debate thereon; as there are some present whom we are specially anxious to hear, may I to call on Mr. John Evans kindly to commence the discussion.\*

Mr. J. EVANS, F.R.S.—I am sure that all present sympathize with the author of the paper, and regret the indisposition which has prevented him from laying his views before us with as much facility as he would otherwise have done. I will preface what I have to say with the remark that he and I, as well as a good many of those who are well acquainted with the manufacture of flint instruments in modern times, and who have studied the question of their production in ancient times, hold very different views. Mr. Michell has attempted to show that instead of these implements (for such, with all respect for him, I must still continue to call them) being of human manufacture, their forms and appearances are due to some mysterious natural causes. In the first place, he has taken up the question with regard to the flint flakes, some of which lie upon the table,—simple forms of flint which are made, at the most, with two or three blows,—upon the evidence furnished by which, when they are found in gravel, unless they occur in considerable numbers, and bear upon their edges the signs of having been used, I am not aware that any archæologist has ever attempted to rely. The bulk of the flakes to which the author of the paper alludes—I mean those which

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\* With a view to carrying out the main object of the Institute, in holding a meeting to which all who take any side in the Flint implement controversy were invited to come and to speak freely, the Editor has forborne to make any correction or curtailment in the following speeches.—[ED.]

are found in such abundance all over the western portion and the centre of England, as well as through almost every other country—have nothing to do with the Palæolithic age, but in reality belong to the Neolithic period down to the time of the Romans, and even more modern dates. Flint is one of those indestructible bodies which when once chipped into form, unless subsequently broken, retains the shape into which it was fashioned, and you may consequently find flints retaining at the present day the same form they possessed almost any number of years ago. When we consider the number of years during which all of us will acknowledge this country has been inhabited, and that for the purpose of producing fire, flint has been in use nearly the whole of that time ;\* and if we then take a population of a thousand for two or three square miles of country, and assume that for fire-making purposes only one flint was chipped by each person in a year, and that that flint produced 20 splinters, you would thus have 20,000 flakes, and if you put the occupation of the country at 2,000 years, you would in that way have 40,000,000 flakes, or, as I would call them, the “strike-a-lights” of our ancestors. This, I say, is the reason why so many flints are found showing signs of blows upon them in the shape of that bulb of percussion which the author of the paper contends does not give evidence of human manufacture. This bulb of percussion occurs where the splinter or flake of flint is dislodged from another piece of flint by means of a blow. The flint is to a certain extent compressible, and where the blow is administered, the body of the flake is driven slightly inwards, and the fracture being prolonged, produces either a cone or the section of a cone. You may in this way produce a beautiful conical surface on a flint, the cone extending into the body of the flint sometimes as much as an inch. This brings me to the other objections that have been raised by the author of the paper ; and here I may say that inasmuch as the paper which has been written by Mr. Whitley

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\* Flint was in use, even up to the year 1841, in the metropolis of this country. The mode of producing fire adopted in the present day in Africa, Australia, the Pacific Islands, and indeed in all uncivilized countries, is by drilling or rubbing pieces of wood together ; and if we may argue in the usual way, from the present to the past, the earlier inhabitants of this country must have produced fire in a similar manner, indeed history goes far to tell us so. With regard to the next portion of Mr. Evans's ingenious theory, there is no record of any country ever having possessed a population at the rate of 500 to the square mile. The present population of the United Kingdom is 292, of France, 200 to the square mile. The population of England and Wales has greatly increased of late ; in 1871, it was twenty-two and three-quarter millions (or at the rate of 389 to the square mile) ; in 1801 it was nine millions ; and in 1550, four millions. The origin of the flint flakes of the Drift has been alluded to by many ; one writer has found a reason for the existence of the “strike-a-lights” of Mr. Evans, in the action of the ice and boulders in the glacial age, action which must have been very similar to that produced by Blake's stone-crusher, specimens of the flakes formed by which were produced at the meeting : these had many of the peculiarities alluded to by Mr. Evans as having been caused by a blow.—[Ed.]

on this subject has been placed in the hands of nearly everybody present, and as Mr. Michell seems to have adopted almost entirely Mr. Whitley's views ; I will take the four points Mr. Whitley has raised against the artificial origin of these Palæolithic implements. I will put, for the moment, these imperfect flakes entirely out of the question, and at once deal with Mr. Whitley's objections. He states, in the first place, that the Palæolithic implements are all of flint, and I believe he infers that the fractures upon them are all the result of a natural agency acting on some property belonging to the flint. When I say that it is not the case that all these Palæolithic implements are of flint, but that they are found chipped out of other materials, and yet that they are still of analogous forms to those which are made of flint, the argument that they are attributable to the natural fracture of flint from ordinary causes must, I think, fall to the ground. I have here two specimens that are almost identical in form and size, and that are chipped in the same manner ; but one of them is of flint, while the other is of felsite, or greenstone.\* One of them was found at St. Acheul, and the other in the neighbourhood of Brandon. I have also an implement of quartzite from the Madras Presidency, as well as other implements made of three different materials, each breaking in a different manner, but all wrought into analogous forms, and consequently evidencing that they must be the result of human workmanship. In the second place, I am told that the implements are all of one type, and that therefore they must be due to natural causes.† I cannot imagine on what grounds Mr. Whitley makes such an assertion as this, for to maintain that the two implements I have here are of one type might, I think, be fairly characterized as a monstrous perversion of terms. Mr. Michell, indeed, goes so far as to acknowledge that there are two types, and others are able to carry them further ; but no doubt there is a gradation observable between one type and another, and this fact, to my mind, is sufficient to show that they are the result of workmanship applied in a certain direction, sometimes forming an oval cutting tool, and sometimes a sharp cutting instrument of a different shape, each being applied to a different purpose. So much, then, with regard to the implements being all of one type. Here is another form of implement with a cutting edge at the side (producing it), and here is a large broad flake with a simple face on one side, showing the cone, or bulb of percussion, while the other side shows the results of a series of blows, each of them producing a separate facet. Then, again, Mr. Whitley

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\* The implements produced by Mr. Evans were of the Neolithic period. Mr. Michell (whom I questioned), and every one in the room recognized them as beautiful specimens of workmanship, totally different in character from the *flakes*, the subject of Mr. Whitley's and Mr. Michell's paper. Mr. Evans, and especially Dr. Carpenter, seem to have considered that Mr. Michell desired to class such implements with the flint flakes of the Drift, in which they were entirely mistaken, and it is to be regretted that Mr. Michell did not correct this misapprehension.—[Ed.]

† This remark appears to have been made by Mr. Whitley with regard to the *flakes*.—[Ed.]

says that the flint implements which have been found, show no marks of having been used by man. Now, Mr. Whitley has done me the honour to quote my book on one or two occasions, but if he had looked into it a little further than he appears to have done, he would have seen instance after instance in which there are distinct marks of these implements having been worn by use on the edges. I state that in nearly all the implements of one particular type there are, on the side of the bulb, marks where the implements have been used for the cutting or scraping some hard substance, and if you will take a newly-wrought flint and use it to scrape bone, you will produce upon it precisely similar marks of wear to those which you see here (showing a specimen). In nearly all the cases in which the implements are discovered in beds of clay or sand, instead of being found in the gravel, in the transport of which their edges are rolled by the action of the surrounding stones, so that it is difficult to trace the signs of actual wear, it is rather the exception than the rule that you should find on their edges no marks of wear. This, to my mind, is a strong argument in favour of the conclusion that they must have been of human origin; for you could hardly say that the men who existed in those early times would have been able to select a sufficient number of implements naturally formed. Nor can we suppose that the same natural causes which might lead to the fracture of flints in this peculiar way, when embedded among other hard substances, such as gravel, would lead to their being fractured in precisely the same manner when embedded in clay, especially where no splinters are found near them. Another argument used by Mr. Whitley is that the implements are found in such great numbers. As I have already explained, the wonder is not so much that they are found in such large numbers, but that we do not find more of them. But let us take the case on this ground alone. What does it prove? Why that they must of necessity be of artificial origin, because it is only in gravels of a certain position and age, and associated with a certain description of fauna, which is now for the most part extinct, that these implements are found. (Hear.) If you search in gravel of an analogous character, but belonging to a different age, you find no implements. As I understand Mr. Michell, he holds that in most cases these implements are stained in a similar manner to the stones in the gravel among which they are found, and is willing to accept the assumption that if they are of human origin they are of the same age as the gravel itself. The question, therefore, is, what is the real age of the gravel itself? This is a question, however, into which I will not now enter, as I have already entered into it elsewhere.\* But I will point out that in some cases these implements,

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\* Dr. Dawson, in his *Earth and Man*, propounds the theory, that at the close of the glacial period, the land rose slowly out of the waters, the clay deposits of the glacial waters being marked over and rearranged by the waves. As the land rose further, its surface was modified by violent rains and streams, by which the valleys were ploughed, plains levelled and overspread by alluvium; and thus it is difficult to discriminate between the river alluvium of

instead of being of the same colour as the gravels in which they are found, are of a different colour altogether, showing that they have previously been deposited in certain beds where they have obtained the colours they exhibit, and that they have afterwards been transported to, and deposited in the beds in which we now find them. I have here a few specimens of the implements of the Neolithic (or Later Stone) period, in which age the hatchets were frequently ground so as to form a cutting edge; but in the case of implements from the gravel, we have not discovered any which bear signs of grinding upon them.\* I am quite prepared to accept what Mr. Michell has

this age and the deposits of the sea, or the older glacial beds; and to distinguish fossils of the older post-pliocene, which must often, in the process of sorting by water, have got mixed with those of the newer. After animal and vegetable life had overspread the new land, palæolithic man was introduced, on the Eastern Continent, and was contemporary with both existing and extinct species. Dr. Dawson adds, "in thus writing, I assume the accuracy of the inferences from the occurrence of worked stones with the bones of post-glacial animals. After this there seems to have had a rapid subsidence and re-elevation of the earth, the geological deluge, which separates the post-glacial from the modern, and the earlier from the later prehistoric period of the archaeologists; and it is not impossible that this constituted the deluge of the Bible. As to the time required for the post-glacial period it has been much exaggerated, the calculations of long time based on the gravels of the Somme, the cavern deposits, the delta of the Tinière, and the peat bogs of France (the peat bog of Abbeville is a forest peat, and the stems in it show that it grew at the rate of three feet in a century; it is 26 feet thick), and Denmark, on certain cave deposits, have all been proved to be at fault, and probably none of these reach further back than 6,000 or 7,000 years, which, according to Dr. Andrews (*Transactions of the Chicago Academy*, 1871), have elapsed since the close of the boulder-clay deposits in America. In 1865 I had an opportunity of examining the now celebrated gravels of St. Acheul, on the Somme, by some supposed to go back to a very ancient period. With the papers of Prestwich and other able observers in my hand, I could conclude merely that the undisturbed gravels were older than the Roman period, but how much older only detailed topographical surveys could prove; and that taking into account the probabilities of a different level of the land, a wooded condition of the country, a greater rainfall, and a glacial filling in of the Somme Valley with clay and stones, subsequently cut out by running water, the gravels could scarcely be older than the Abbeville peat." Dr. Dawson in like manner fails to perceive,—and believes American geologists will agree with him,—any evidence of great antiquity in the caves of England or Belgium, the kitchen middens of Denmark, the rock shelters of France, or the lake habitations of Switzerland. He also speaks of Dr. Andrews' observations on the raised beaches of Lake Michigan, observations which have been much more precise than any made in Europe, enabling him to calculate that North America rose out of the waters of the glacial period between 5,500 and 7,500 years ago, and thus fixing the duration of the human period in America; there are other lines of evidence which would reduce the residence of man to a much shorter period; longer periods have been deduced from the deposits at the delta of the Mississippi, but *Hilgard has found them to be in great part marine.*—

[Ed.]

\* Sir John Lubbock has suggested the terms *Palæolithic* and *Neolithic* for the two main divisions of the Stone age. Implements of the Palæolithic

put forward as to there being a broad line of distinction to be drawn between implements found in the gravel and those that belong to the Neolithic, or surface period; but I must say that I do not see such a marvellous difference as he sees in the character of the chipping of the two periods. It is true that the chipping of the earlier period is such as we might ordinarily expect from man in a low degree of civilization; but, occasionally, in the older deposits, we find instruments as beautifully chipped at the edges as those of the later period; while, on the other hand, in the Neolithic, or surface period, we occasionally find instruments as rudely, or even more rudely chipped, than many of those which belong to the gravel, or the Palæolithic period. It is but reasonable to suppose that where a flint was taken merely to serve some temporary purpose, the point, or edge, was just chipped into form, and that when it had served the object for which it was intended, it was thrown aside as no longer of any use, in the same way as, up to within the last twenty or thirty years, flints used to be taken and roughly chipped into form, in order to be placed in the tinder-box to serve for obtaining a light in the morning; and I have no doubt that many of these roughly-chipped flints do belong to the "strike-a-light" period. I have here two implements chipped in the same manner, so that Mr. Michell would say there is no difference traceable in them. One is of the Palæolithic period, and is, I conclude, intended to be used at the point, and the other is a hatchet of the Neolithic period, dexterously ground to an edge at one end. I think it would be impossible to get two implements presenting more precisely the

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period are formed by the process of chipping only; no single instance of finishing them by artificial rubbing has been observed. During the Neolithic period some of the flint and stone implements, such as hatchets and axes, after having been chipped into shape, were finished by artificial rubbing or polishing, whilst many others, such as arrow-heads and scrapers, were still formed by the process of flaking and chipping only. The implements of the Palæolithic differ greatly in form from those of the Neolithic period. No implements of characteristic Neolithic types have been found under circumstances enabling us to assign them to the Palæolithic period, but the reverse cannot be asserted, although cases are rare. (*Flint Chips*, by Stevens, p. 34.) Dr. Dawson, in his *Earth and Man*, says:—"In England all before the Roman invasion is prehistoric; the evidence of this period is chiefly geological in character; the prehistoric men are essentially fossils; we know of them merely from what can be learned from their bones and implements embedded in the earth, or caverns; for the origin of these the antiquary goes to the geologist, and imitates him in arranging his human fossils under such names as the 'Palæolithic,' or period of rude stone implements [to some this particular definition has seemed scarce satisfactory.—Ed.]; the 'Neolithic,' or period of polished stone implements; the Bronze period, and the Iron period; though inasmuch as the higher and lower state of the arts seem always to have coexisted, and the time involved is comparatively short, these periods are of less value than those of geology. In Britain, the Iron age is mainly historic, the Bronze goes back to the time of early Phœnician trade, and the Stone reaches further back. In Western Asia, the Bronze and Iron ages are 2,000 years earlier than in Britain, while in America, the Palæolithic age of chipped stone implements still continues."—[Ed.]

same characteristics, but at the same time belonging to two totally different periods. I have here a stone which in form is a purely Palæolithic implement, characterized by the rude chipping of the period, and in all its essential features it is similar to the implements found in the drift; but I happen to be able to give you the origin of it, for I chipped it myself with a round pebble. With regard to Mr. Michell's argument that has been brought forward as to sand having the power of chipping flint, there is no doubt that sand does possess a certain polishing power, and in many instances, in the case of implements found in sandy beds, they are observed to have a very fine polish on their surfaces; but that polish always follows the lines of the chipping by which the implement was originally fashioned; and in the case of the flints exhibited by Mr. Michell, you may see, in some instances, the impression of the bulbs of percussion, showing where the splinters have been dislodged in the shaping of the implements; while in others you may see the lines of the conchoidal fracture, preserved by the action of sand. I think I have now said enough to show what are the views held on this subject by myself, views which I think Mr. Whitley has in one or two cases misapprehended.

Mr. WHITLEY.—I have not the honour of being a member of this Institute, but I have brought from Cornwall a great number of the flints which you see on the table, and which I have collected during the past ten years. I have had the opportunity, in the prosecution of my profession as an engineer, of observing the mode in which they are distributed, and the extent to which they are deposited over the whole of the south-west of England. In addition to this, I have taken a good deal of interest in the subject we are discussing, and the result of my investigations has been to convince my own mind that a mistake has been made by some of our scientific men. With all due respect for the opinions of those who differ from me, and for the high and prominent names by which this flint implement theory has been supported, I have come to a conclusion contrary to that at which they have arrived, and think I have good reason on my side for believing that these so-called implements have been formed by natural causes, and not by the hand of man. (Hear.) I am more accustomed to the field-work of an engineer, than to addressing an audience in a room like this, and I trust you will excuse me if I do not refer in detail to all that Mr. Evans has said with regard to myself; but I do say most confidently, that I have been very careful not to misquote him, and on all occasions to refer to my authorities where it has been necessary. If he will adduce any instance of a misquotation, I shall at once, with the greatest pleasure and sincerity of purpose, acknowledge my error. Mr. Evans has done me the honour to refer to the arguments which, simply and plainly, I have used against the implement theory. I have observed in my paper, and, I believe, on Mr. Evans's authority and that of Sir John Lubbock, that all the implements of the Palæolithic period are made of flint, and I think if I were to search their works I should be able to certify that this is

their opinion as well as mine.\* The only evidence Mr. Evans has given that I have made a mistake on this point, is that there are implements found in Madras which are said to be quartzite.

Mr. EVANS.—I also mentioned one from Brandon that was made of felsite, or greenstone.

Mr. WHITLEY.—I think it probable that it was of chert. There are a great many varieties of flint, and we should take care not to be misled on this subject by a particular variety of the mineral. Chert is a variety of flint, and when Mr. Evans refers to the quartzite of India, everybody knows that all the implements of the greensand are chert implements. There are upon the table some chert implements which I obtained from the greensand round Axminster, and there are some flakes by their side which have come from Pressigny-le-Grand, which will illustrate what I have stated. I have also to refer to another point, and that is with regard to the great number of these so-called implements. I have stated that these implements are so great in number as to lead to the conclusion that they must have been produced by natural causes, and not by the hand of man. At St. Acheul I searched the gravel-beds, and it is a fact that, from three acres of land at that place, no fewer than 3,000 of these "tools" have been exhumed, or an average of 1,000 axes per acre! I ask, whether any one could expect to find in any river-bed, in any part of the world, as many as ten lost axes, even in the neighbourhood of a large town? (Hear.) Now, 1,000 lost axes per acre would give a total of 640,000 in a square mile, and as these beds are scattered throughout the valley of the Somme for twenty miles, you will find, on making a calculation, that the proportion of lost axes to the number of savages would be about six million to one! (Hear, hear.) As I have come three hundred miles to attend this meeting, I should like to lay some of the main facts of the case before the audience I have the honour of addressing, trusting that in doing so you will kindly bear with my imperfections as a speaker. In carrying out the engineering works in which I have been engaged in North Devon, I walked to Croyde, an exposed cliff on the western shore, and there I found what are termed by some "bundles of flakes," and what others call "nests of flakes," on the soil above the seashore. I stated this fact in a paper which Professor Huxley did me the honour of reading before the Geological Society, and I have been told that I made a great mistake, and that what I had seen was the site of a manufactory! Several gentlemen have since been down and examined those flakes at Croyde, and they declare that there has been a manufactory there of Palæolithic

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\* Mr. Evans says, "The material from which all the implements hitherto discovered in the drift of this country and of the north of France have been formed, is the flint derived from the chalk." (*Archæologia*, vol. xxxix. p. 64 (1865?).) Again—"that in the Palæolithic period—the material used in Europe was, moreover, as far as at present known, almost exclusively flint." (*Ancient Stone Implements*, p. 49 (1872).) Sir John Lubbock says, of the drift implements, "All those hitherto discovered are made of flint." (*Prehistoric Times*, 1st ed., p. 279 (1865).)

tools! As my duties kept me in that locality for some years, I explored the whole country round. I was engaged in embanking, making roads, and in draining land, and I found that these flakes were scattered through the subsoil over an area of about twenty miles in length and ten miles in breadth, and yet I am told that this was "a manufactory of Palæolithic tools"! Now, I will ask you to consider this theory in relation to one fact to which I will call attention. The manufactory required for the whole of the British navy at Keyham covers an area of just one square mile. According to those who say that these flakes at Croyde and its neighbourhood are evidence of a manufactory for a few scattered savages, the manufactory must have covered an area of two hundred square miles! I put it to the common sense of those whom I am addressing,—could this have been a manufactory? What to my mind is certain, and what I am ready to prove against all comers, is this: that these flint flakes have a geological and not an antiquarian origin. (Hear, hear.) Walking along the seashore, it can be seen that the flakes, which are found in the subsoil inland, and the resupposed to be "nests of flakes," are exposed in cliff sections, and may thus be traced for a considerable distance along the shore-line. I traced these flakes from the Scilly Isles, and found the drift of shattered flints again at the Land's End, where they are scattered over an area of seven miles in length. I traced them beyond this to different places, namely, St. Ives, St. Agnes, Padstow, Hartland Point, and several of the headlands in that district and beyond Ilfracombe. I traced them, also, across the Channel to Caldy Island, and along the south coast of Wales; and Sir Roderick Murchison has indicated by his map that these flakes are found on the western coast of Wales. They are scattered on the Isle of Man, and you may follow them until you come to the very spot where they originate, in the county of Antrim, at Carrickfergus, and Larne. In fact, on the other side of the Irish Sea, these so-called flint "implements" are scattered along the eastern coast of Ireland from Antrim as far as Ballycotton Bay in the county of Cork. This certainly looks as if we had found the origin of the flakes; but there is more conclusive evidence yet. The flint drift of Antrim is known by three well-recognized marks. In connection with this drift we find the indurated chalk known as the white limestone—a peculiar kind of limestone found in the north of Ireland, hardened by basalt. I have found at Scilly frequent examples of the basalt, and I have also noticed among those islands some of the burnt flints, such as are found at Antrim between the basalt and the chalk; so that in this threefold cord, which cannot be easily broken, you may trace the origin of these flints to Antrim as surely and as completely as you can trace the origin of the negro to Africa. (Hear, hear.) And it should be noticed that these flints are not carried and scattered about as they would be if they had been used as gun-flints, or, in earlier times, as arrow-heads, but they are found in a regular geological stratum about two feet below the soil; and what is more remarkable still, throughout the whole of Cornwall, as every surveying engineer in that part of the country knows, you will find under the soil a stratum of shattered quartz and hard stones

which have somehow been broken and smashed up. With these broken quartz the flint-flakes are found mixed. Leaving Cornwall, and coming to Cissbury-hill, the flint-flakes are found in a thick stratum, and in cart-loads, about two feet under the soil on each side of the hill. I went to Belgium, and at Spiennes, near Mons, I found these flakes most abundant. I found them in the village at the top of the gardens, and two or three feet below the surface of the soil there was a stratum of most perfect flakes, with the bulb of percussion plainly developed, and all the usual marks of "chipping." This stratum was six inches thick, and I traced it for more than a quarter of a mile along the country. And not only was this the case, but I found that by denudation these flakes were scattered over the soil in the lower district. Certainly, when you look at one of these flakes, and at the way in which it is chipped—and consider that the antiquaries say that all the blows were delivered on one end, and for one purpose—there does appear to be some reason to think that they have not been formed by natural causes; but it happens that I am engaged in making roads and in doing engineering works at Eastbourne, and my contractor there prepares the metalling for the roads by crushing large nodules of flint with one of Blake's stone-breakers. There are two men engaged in shovelling in the flints, and as fast as they can feed the crushing machine, the great iron jaw, which is worked by a steam-engine, crushes the pieces. From these crushed flints which are manipulated by this powerful and unintellectual crusher, I can pick out flint-flakes and "cores" in any number. On those flakes, you will see the bulb of percussion, the marks of chipping, and every evidence of manufacture as perfectly demonstrated as they are on the flakes which Mr. Evans sets down as having been formed by human agency. I say this advisedly and with great respect for all who differ from me. I will only make a few further remarks. Mr. Evans has rather taken the wind out of my sails by the course he has taken in answering my arguments; but I am quite certain of this, that none of these implements, nor of those which have been brought from St. Acheul, nor any that are on the table in this room, bear the same marks of use upon them as the Neolithic implements bear. Mr. Evans has put it very strongly that they do bear marks of use; but he did not say that the marks of use on the Palæolithic tools were of the same character as the marks of use which are observable on the Neolithic implements. I have seen and examined in the museums at Abbeville and Salisbury, and in the gravel-beds of Norfolk and elsewhere, probably more than a thousand of these flint implements, and I am able to declare with great honesty and sincerity that I have not been able to find a single implement that bears the same kind of marks of use which are borne by the Neolithic tools.\* If you will allow me, I will endeavour to illustrate

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\* The following seems to give indirect support to the views Mr. Whitley holds:—"To Dr. Hooker I have been indebted for some examples of stones, the first specimens of which were picked up by Mr. Hackworth on the shores of Lyell's Bay, New Zealand. . . . The stones, which have a strong resem-

this point. Here is a Neolithic implement (producing it) found near Abbeville, and the indications of use upon it are obvious. There are the marks of grinding on the surface, and the instrument looks as if its point had been worn back, while there is an indentation as if it had been rubbed by a thong. This, I admit, is as obviously a work of art as any "Sheffield whittle"; but I have not found, and I must add that I do not think Mr. Evans can find, the same marks of use on the Palæolithic tools. I know that Mr. Evans says they do bear marks giving evidence of wear; but I say that what he calls wear may have arisen from friction and attrition in a gravel-bed as well as from their having been used by man; and, furthermore, Mr. Evans does not say that they always show marks of having been so used, which, of course, is quite a different thing from attrition in a gravel-bed. However, in some cases Mr. Evans does attempt to prove that there are marks of wear on these flints as exhibited by the serrated edges. In reply to this, I wish to call attention to the fact that all the marks of wear found on the Neolithic tools are shown in the smoothness of edge which has resulted from use; but in the case of the Palæolithic tools the evidence of use relied on by Mr. Evans has been the jagged edges. (Hear, hear.) I would here refer to the circumstance that in the criticism Mr. Evans has made on my pamphlet, he does not controvert that portion of it in which I assert that "no relics of man are found in the drift with the so-called implements." I repeat again, that no such relics are found in the gravel-beds mixed up with the Palæolithic tools. You are all aware of the intense interest that was excited by the human jawbone which was said to have been discovered by Boucher de Perthes at some depth in the gravel at Abbeville; but after the examination which was made of that jaw by Dr. Falconer and other scientific gentlemen well able to pronounce an authoritative opinion on such a subject, that jaw has been put on one side, and can no longer be admitted into the controversy.\* (Hear.) There is another point to which I might refer in connection with this subject, and that is, that wherever the other works of man are found along with his implements, they are found only upon the surface and not in the drift. For instance, in the valleys of Switzerland, we find that the ancient people who lived in those lake districts have left behind

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blance to works of human art, occur in great abundance, and of various sizes, from half an inch to several inches in length. A large number were exhibited, showing the various forms, which are those of wedges, knives, arrow-heads, &c., and all with sharp cutting edges. . . . Dr. Hector stated, that although, as a group, the specimens on the table could not well be mistaken for artificial productions; still the forms are so peculiar, and the edges, in a few of them, so perfect, that if they were discovered associated with human works, there is no doubt that they would have been referred to the so-called 'Stone period.'—Professor Tyndall in *Macmillan's Magazine* for May, 1873, p. 57.

\* One of the teeth being extracted and examined, was found to be not yet dry!—[Ed.]

them not only their flint tools,\* but remnants even of their food—the baked corn they used to eat—as well as the raiment they used to wear, their ornaments, pieces of their pottery, and a number of other things, which abundantly prove man's existence there ; but when we go to the gravel-beds we find no other relic of man than these so-called Palæolithic flint tools, if I am to except the necklaces of the Palæolithic girls—(laughter)—which have been found in the gravel-beds of St. Acheul. I have upon the table a few of these beads, which are said to have been the work of man. Here (producing several specimens) are some of them. These sub-globular sponges have been examined by Professor Rupert Jones and Dr. Carpenter, and pronounced by them to be fossil organisms of the chalk, which Professor Jones says can be found in abundance in the chalk, “either in the perforated condition, or solid, or with a more or less shallow hole in their substance.” This being so, I say that it is a cruel thing to arrange these fossils on a string in the form of a necklace and dangle them (here Mr. Whitley held up a string of the fossils) before the eyes of the uninformed as relics of Palæolithic man. (Laughter and applause.) I must not trespass much further on your time ; but may state that there are many implements here in reference to which I am quite ready to offer any explanations that may be needed, and shall at all times be willing to meet and answer any one on this subject. I trust that I shall always be able with honesty and good temper, and at least with some scientific skill, to argue the question, and I repeat that my strong impression is, from an intelligent inspection, that both these beads and these Palæolithic implements have been produced by natural causes, and not by the hand of man. There is just one other point to which I should like to refer before sitting down. There are upon the table a great number of discs, which are termed “discoidal implements” by Mr. Stevens, and he tells us that they are sometimes found chipped into form so as to make very good Palæolithic missiles. Now, these things are very common. Here is a great piece of chert that I picked up, and on every side of it you may see little cups, which it is contended are evidence of the chipping where the “discoidal implement” has been broken into shape. Here is another specimen, also of a large size. Now, if you look at these pieces of flint, you will see little cups broken all over them, and these little cups have all been acknowledged by those who have examined them to be perfectly natural. Here is a beautiful one from Pressigny-le-Grand, and numbers of them are found scattered all over Norfolk. One of them is so small that it might be used as a button of the smallest size ; and here is another from Eastbourne, so large that it could hardly be put into the pocket. It only requires a careful inspection to prove that these marks on the flint are all produced by natural causes. Here is a most beautiful flint knife from the Taw, which has all the marks of

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\* Professor E. H. Palmer, in his admirable work, *The Desert of the Exodus*, found the same implements at the mines which were worked by the Egyptians at the time of the Exodus.—[Ed.]

chipping, but no one can say that it has been formed by man. My last search was made at Axminster on Saturday. On one side of the table there are twenty tools, which I then discovered, and which would be called Palæolithic if they had been found in Brixham cavern ; in the course of one hour I picked them all up in one field, and the "cores" are in every way as good and as perfect as those which Mr. Evans has drawn in his work, and which were found in one of the Indian rivers. (Applause.)

Dr. W. B. CARPENTER, F.R.S.—In appearing here to say a few words on this subject, I wish it to be understood that I am not about to address myself to the general question. I am not a geologist, neither can I call myself an archæologist ; but I do wish to say a few words upon the general question of evidence, because that is a subject to which I have paid special attention. In my address, as President of the British Association at Brighton, I said that this was one of those questions in which common sense was superior to logic. Mr. Whitley has given us a good deal of common sense to-night ; and as far as he has done that, I go along with him. I have taken some pains to study what is called common sense, and to endeavour to arrive at what it really is, and how we are to get at it ; and if any one wants to know what are my opinions on this subject, he will find them in an article which I wrote, a year and a half ago, in the *Contemporary Review*. I there stated that logicians had come to no agreement as to the sources of our knowledge of the external world ; that every logical proof which the greatest logicians, such as Sir William Hamilton and others, have attempted to give of the existence of an external world,—or of such a proposition as that I am here among a number of persons, and that to say so is not a mere fallacy evolved out of my own consciousness,—has been invalidated by some other logician ; and yet, I ask, who can disbelieve the fact ? Our belief in such a case is based entirely on common sense ; and what I call common sense I will briefly define as the general resultant of the whole previous training and discipline of our minds. In certain things, as to which we all agree, common sense is sufficient for all of us, because our minds are all so constituted that we come to the same conclusions with regard to them ; as, for instance, upon the question of the existence of an external world. There are, however, other cases in which the trained common sense of men who have made special departments of science their study, lead those who have so trained themselves to very positive conclusions, which may and often do appear unsound or even absurd to such as have not studied these special subjects. For example, the remarkable results of the spectroscope, to those who have not mastered the scientific principles by which they have been arrived at, may seem preposterous. It may appear absurd to say that a jet of incandescent hydrogen, fifty miles high, shall burst out from the sun and disappear in ten minutes, this assertion being made on the strength of two or three fine red lines shown in the spectroscope ; and yet no person who has made a special study of the subject has the least doubt about it. To me it seems that no person who has used his common sense, without any previous prejudice, can come to any other conclusion, when he sees a whole series

of objects like those Mr. Evans has produced, than that they have been the work of human design, and intended for special purposes. (Hear.) It is true that each individual blow upon one of these flints, taken by itself, might be regarded as an accidental fracture; but when we take up one of the implements and see the definite and symmetrical contour that has been given to it, the manner in which the different blows have been made in succession so as to produce a regular and uniform edge, and when, in addition to this, we see that several of these tools are declared to have all been taken out of the same gravel-bed, and when we observe the same general conditions attaching to all of them, and especially when we find them made out of different materials, it certainly does appear to me that common sense can only point to the one conclusion,—that they have had a human origin. (Hear.) And here I will give you an example as to the value of common-sense judgment, which I think every one will be able to appreciate. I remember hearing, a few years ago, a statement of the circumstances under which a man was enabled to trace a lost purse. He was robbed of his money, and the man who committed the theft ran away. The supposed thief was caught, and a purse was found upon him, which, however, he declared was his own. The man who had lost the purse could not swear to it, as it was of a common type, but he was able to say exactly how much money was in the purse of which he had been robbed, and he named the precise sum. He was further asked, "Do you know what form the money was in?" and he replied, "Yes; there were a half-sovereign, a half-crown, a florin, three shillings and two sixpences." He happened to remember, having taken some change not long before, that that was the precise amount of the money, and the precise form in which he had received it. The jury found unhesitatingly and upon the moment that the purse and the money were his, and I think that any one I am now addressing would have done the same. Now, I apply the argument I have been using to this case; for although any individual sixpence, or shilling, or half-crown might have been in another purse than that of which the man had been robbed, yet the concurrence in this case of the precise number and amount of the different pieces in the purse, and their identity in these respects with what the prosecutor had lost, were so convincing that the conviction could not be resisted. It appears to me that this is precisely the kind of judgment on which we should come to a decision on such a subject as we are now discussing. I cannot myself conceive any other conclusion that is to be drawn from the premises. I do not lay the least stress on the general question to which Mr. Whitley has directed attention to-night, as to whether certain flint-flakes are natural or artificial; for it never appeared to me that they had anything like the same amount of evidence in favour of their human origin, as is furnished by the more perfect implements.\*

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\* With regard to what has been said as to the flint flakes, I would remark that before we can form any definite conclusion, we must set the numbers of the supposed flint implements against the supposed indications that they have

A flake may be made by accidental blows. This flake, for instance (taking up one) has only three fractured surfaces upon it: on this (taking up another) there are two or three. But here is an "implement" on which I should not, perhaps, be wrong in saying there are 150 fractures, and I ask, is it conceivable that 150 fractures could be made to produce such an object as this by any natural or accidental process? \* (Hear, hear.) It may be conceivable to some minds, but it is inconceivable to mine. Having been trained to the study of evidence, I find it, I repeat, inconceivable that this object could have been made except by design, and for a special purpose. The matter is one of common sense, and the common sense of mankind agrees in one conclusion. I do not base my argument on any opposition to Mr. Whitley's conclusion, that all these small flakes have been made by natural causes; but I base it on these highly-elaborated artificial implements from the Somme valley gravel-beds. † There is another point on which I might make a few observations. I find that not only in the paper of this evening, but likewise in other works which have appeared on the same side, it is imputed over and over again that scientific men have gone into this subject with a prejudice; and they are charged with a scientific cliqueism which prevents their accepting the truth in this matter! Now, if I were to go

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been formed by man. If they are to be found in such enormous numbers, if they can be arranged in a series varying from the most imperfect to the most perfect forms, if they can be produced by flint-crushers, it would be necessary that we should possess the most certain evidence that no power of nature was adequate for their formation before we could arrive at the conclusion on principles of common sense that the fact of their human origin was proved. —[Rev. Preb. C. A. Row, M.A.]

\* The first flint Dr. Carpenter took up was one which Mr. Whitley and Mr. Michell held to belong to the Palæolithic age, and to be naturally chipped; as to the second, no one in the room thought of disputing the fact that it was manufactured. The whole contention, on the part of Mr. Michell, Mr. Whitley, and others, was in regard to the first. —[Ed.]

† The genuineness of some of these implements has been more than questioned. Mr. Keeping, a practical geologist, who went over to Abbeville, says he spent a week with a pickaxe searching in vain for implements; and the Honorary Secretary of the Geological and Numismatic Societies wrote as follows to Mr. Prestwich as to the honesty of some of the workmen:—"The proofs I gave in my former letter were, I think, sufficient to show that a regular system of imposition has been carried on by the gravel-diggers of Abbeville; that the majority of implements lately obtained at Moulin Quignon are false. . . . But if more conclusive evidence of fraud be required, I am now prepared to give it." And Mr. Evans, writing in the *Athenæum*, 6th June, 1863, said:—"Genuine implements have been hitherto comparatively rare at Moulin Quignon. The suspected implements are now found in abundance." The rarity of those implements which Mr. Evans holds to be genuine may be gathered from the following extract from *Flint Chips*, by E. T. Stevens (p. 39):—"In April, 1857, Mr. Prestwich and Mr. J. Evans inspected the Abbeville beds, under the guidance of M. Boucher de Perthes; and at Amiens, Mr. Prestwich and Mr. Evans saw one of the pear-shaped flint implements *in situ*. In the same year Mr. J. W. Flowers found a pear-shaped implement *in situ* at Amiens. Shortly afterwards Mr. James Wyatt and Mr. T. Rupert Jones were equally fortunate." —[Ed.]

into the real history of this inquiry, I think I could show that there has, upon the contrary, been great resistance on the part of the scientific men to the acceptance of the views they now entertain, and that these views have only been forced upon them by the weight of evidence. (Hear.) A Roman Catholic priest, Mr. J. MacEnery, worked out the subject thirty years ago. He found flint implements in Kent's Hole associated with the bones of extinct animals, and he wrote an account of the discovery and had plates drawn, which he sent up to Dr. Buckland. What did Dr. Buckland say? How did he treat the matter? Did he at once bring it out as a grand new scientific discovery,—as one that he welcomed and was glad to put before the world? On the contrary, he persuaded Mr. MacEnery to keep the matter quiet; and the result was that his paper did not appear until after Mr. Prestwich's researches in the valley of the Somme had brought the matter before the scientific world in a manner that was not to be resisted. Did the researches of M. Boucher de Perthes meet with approval in the first instance? \* Why, nobody thought anything of them until Dr. Falconer, while passing through the neighbourhood in which M. de Perthes' museum was, thought he might as well take a look in, and there he found that which satisfied him that there really was something worthy of investigation. Did Sir Charles Lyell show any disposition to accept heretical conclusions, when he visited the caverns of Liège, five-and-twenty years ago, and found human bones in the same deposit and condition of penetration by minerals, as the bones of extinct animals? When the professors there pointed out to him that there was just the same evidence of antiquity in the human bones as in the others, did he accept their reasoning? No; but he blamed himself ten or fifteen years afterwards for his incredulity. He said, "I ought to have accepted that evidence," and he regretted his former want of belief when the later testimony was flashed upon him. Did one of the scientific Englishmen, who went over to Abbeville to discuss that question of the human jaw, show himself desirous to bring forward heretical opinions, when they all took the side of those who were endeavouring to prove, and who did prove, ultimately, that that jaw was a

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\* M. Boucher de Perthes does not seem to have been without his own doubts upon the subject, for we read in his *Antiquités Celtiques*, tom iii. p. 11 :—"J'y voyais des haches, et je voyais juste, mais la coupe en était vague et les angles émoussés; leur forme aplatie différait de celle des haches polies, les seules que l'on connût alors; enfin, si des traces de travail s'y révélaient, il fallait réellement, pour les voir, avoir les yeux de la foi. Je les avais, mais je les avais seul: ma doctrine s'étendait peu, je n'avais pas un seul disciple." "I traced the hand of man in the hatchets, and I judged rightly, but the proof of the workmanship was dubious, and the angles were blunted; the broad shape of the tools differed from that of the polished hatchets which alone were then known. In short, if the traces of human work were to be seen, it was indispensable to the perception of them to have the eyes of faith. I had them, but I alone had them. My opinion found little favour; I had not a single disciple."—[Ed.]

plant"? (Laughter.) I can assure this meeting that there never was a question more thoroughly and completely sifted by arguments, coolly and dispassionately, but earnestly advanced. For two whole days this question of the jaw was discussed, and the whole subject of these flint implements was brought up; but not a single scientific man belonging either to England or to France contested the human origin of those implements, or had the smallest doubt of it. A set of flint implements were produced, which there were strong reasons to believe had been made by modern workmen, and planted in the bed to give authenticity to the jaw. Those flint implements were carefully washed and examined, and compared with the undoubtedly genuine implements, which had been taken out of undisturbed gravel-beds, and which showed the most unmistakable evidence of age.\* The fictitious

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\* Dr. Dawson, F.R.S., remarks, in his work, *Archæia*:—"It may be anticipated that almost every year will produce supposed cases of human remains or works of art in the later tertiary deposits. There are so many causes of accidental intermixtures, and ordinary observers are so little aware of the sources of error against which it is necessary to guard, that mistakes of this kind are inevitable. Even geologists are very likely to be misled in investigations of this nature. A remarkable instance of this, in the case of the delta of the Nile, has been already noticed. Another discovery, which has lately made some noise in the scientific world, is probably referable to the same category. I refer to the supposed occurrences of implements of flint in the gravel at Abbeville, in France. This was first maintained by M. Boucher de Perthes in 1849; but his statements appeared so improbable that little attention was given to them. More recently, Mr. Prestwich and Mr. Evans have brought the subject before the Royal Society and the Society of Antiquaries in England, in connection with the discovery of flint weapons with bones of extinct animals in a cave at Brixham.

"1. The implements found are described as follows by Mr. Evans, as reported in the *Athenæum*:—

"1. Flakes of flint, apparently intended for knives or arrow-heads. 2. Pointed implements, usually truncated at the base, and varying in length from four to nine inches—possibly used as spear or lance-heads, which in shape they resemble. 3. Oval or almond-shaped implements, from two to nine inches in length, and with a cutting edge all round. They have generally one end more sharply curved than the other, and occasionally even pointed, and were possibly used as sling-stones, or as axes, cutting at either end, with a handle bound round the centre. The evidence derived from the implements of the first form is not of much weight, on account of the extreme simplicity of the implements, which at times renders it difficult to determine whether they are produced by art or by natural causes. This simplicity of form would also prevent the flint-flakes made at the earliest period from being distinguishable from those of a later date. The case is different with the other two forms of implements, of which numerous specimens were exhibited; all indisputably worked by the hand of man, and not indebted for their shape to any natural configuration or peculiar fracture of the flint. They present no analogy in form to the well-known implements of the so-called Celtic or Stone period, which, moreover, have for the most part some portion, if not the whole, of their surface ground or polished, and are frequently made from other stones than flint. Those from the Drift are, on the contrary, never ground, and are exclusively of flint. They have, indeed, every appearance of having been fabricated by another race of men, who,

implements, which had been manufactured by workmen, and had had a good colour given to their surface by being buried in the dark ferruginous sand, were found to be quite clean, new, and sharp ; but the genuine implements were penetrated with iron infiltration, and their edges showed distinct marks of having been used. No one has mentioned to-night what struck me as one of the most curious specimens in M. Boucher de Perthes' museum. One of the flint implements presented the rough Palæolithic form on one side, having been blocked out by blows ; while not only was the other side polished, but there was by the side of it the very stone on which it had been polished, as could be proved by the perfect fitting of the one to the other. Those two stones were found very near together in the gravel-beds of the Somme valley. There is only one point further that I should like to advert to. As I have said before, scientific men have been charged with a desire to go against the received beliefs on these subjects.

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from the fact that the Celtic stone weapons have been found in the superficial soil above the Drift containing these rude weapons, as well as from other considerations, must have inhabited this region of the globe at a period anterior to its so-called Celtic occupation.'

"The objects found are here admitted to differ from the implements of the primitive Celts, and they differ in like manner from those of the American Indians, which are almost if not quite undistinguishable from those of ancient Europe and Asia. One at least of the kinds mentioned has scarcely a semblance of artificial form, and the others are all merely fractured, not ground or polished. In so far as one can judge, without actually inspecting the specimens, these appear to be fatal defects in their claim to be weapons. The observers have evidently not taken into consideration the effects of intense frost in splitting flinty and jaspery stones. It is easy to find, among the *débris* of the jasper veins of Nova Scotia, for instance, abundance of ready-made arrow-heads and other weapons ; and there is every reason to believe that the Indians, and perhaps the aboriginal Celts also, sought for and found those naturally split stones which gave them the least trouble in the manufacture, just as they selected beach pebbles of suitable forms for anchors, pestles and hammers, and hard slates with oblique joints for knives. To these natural forms, however, the savage usually adds a little polishing, notching, or other adaptation ; and this seems to be wanting in the greater part of the specimens from Abbeville.

"2. Nothing is more difficult, especially in an uneven country, than to ascertain the extent to which old gravels have been re-arranged by earthquake waves or land floods. Nor does the occurrence in them of bones of extinct animals prove anything, since these are shifted with the gravel. Very careful and detailed observations of the locality would be required to attain any certainty on this point.

"3. The places in which gravel-pits are dug, are often just those to which the aborigines are likely to have resorted for their supply of flint weapons. They may have burrowed in the gravel for that purpose, and their pits may have been subsequently filled up. Further, savages generally make their implements as near as possible to the places where they procure the raw material ; and in making flint weapons, where the material abounds, they reject without scruple all except those that are most easily worked into form. If of human origin at all, the so-called weapons of Abbeville are more like such rejectamenta than perfected implements. This would also account for the

I reply that, so far from this being the case, they have resisted the evidence put before them as long as they could ; but let me inform this meeting as to what a most eminent scientific man, and a most firm believer in those views as to the authority of the Scriptures, which this Society desires to maintain—I allude to the late Dr. Prichard—thought ; and what was his judgment on the general question of the Antiquity of Man before this particular part of the subject came up. It is remarkable that physiologists have long been coming to the conclusion, that if you are to limit to a few hundred years the period of man's existence on this earth before the Exodus, commencing from the period usually assigned to the Deluge, it is difficult to imagine how the three distinct forms of the human race, exhibited by the Negro, the Egyptian, and the Jew, all of which are so clearly and definitely shown in the paintings of ancient Egypt, could have arisen in so short a space of time. (Hear.)\* Dr. Prichard was a very firm advocate of the doctrine of the unity of the human race, and the derivation of the whole of that race from one common stock. He wrote a most learned and laborious work on the subject, and the last

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quantity found, which would otherwise seem to be inconsistent with the supposition of human workmanship.

"4. The circumstance that no bones or other remains referable to man have been found with the flint articles, is more in accordance with the suppositions stated above, than with that of their human origin, in any other way than as the rejectamenta of an ancient manufacture.

"5. From a summary of the facts given by Sir Charles Lyell at a meeting of the British Association (1859), as the result of personal investigations, it appears that the gravels in question are *fluvial* and dependent on the present valley of the Somme, though still apparently of very great antiquity. This places the subject in an entirely different position from that in which it was left by Perthes and Prestwich. River gravels are often composed of older *débris*, re-assorted in a comparatively short time, and containing tertiary remains intermixed with those that are modern ; and it is usually quite impossible to determine their age with certainty. Further, if we may judge from American rivers, those of France must, when the country was covered with forest, have been much larger than at present ; and at the same time their annual freshets must have been smaller, so that nothing is more natural than that remains of the savage aborigines should be found in beds now far removed from the action of the rivers. When to this we add the occurrence at intervals of great river inundations, we cannot, without a series of investigations bearing on the effects of all these changes, allow any great antiquity to be claimed for such deposits. The subject is, in short, in such a condition at present, that nothing can with safety be affirmed with respect to it.

"I may add that Sir Charles Lyell, while admitting the apparent contemporaneous association of human remains with those of extinct animals of the Tertiary period at Brixham, rejects as modern the so-called fossil men of Denise in central France, which had been associated with the Abbeville discoveries."

\* Dr. Kitchen Parker, F.R.S., President of the Microscopical Society, whilst dissatisfied with the modern view of the Chronology of Genesis, yet has called my attention to the distinct race that the Americans are becoming, how a short time has produced a considerable change. He says, "The Yankee is a good subspecies already, and a very fine new type he is."—[Ed.]

edition of his book came out in successive volumes. During the publication of this edition, it was reviewed by a very able critic, who brought as an objection to the doctrine, the impossibility of supposing that the divarication of races could have taken place in so short a time as is allowed by the usual chronology. In a long and learned note, Dr. Prichard goes into the question of what is the value of that chronology. Now, Dr. Prichard ranked as a physiologist among physiologists, as a philologist among philologists, and as a scholar among scholars; and if any one will read the long note at the end of the fifth volume of his great work on the *Physical History of Man*, he will be impressed with Dr. Prichard's thorough honesty and sincerity, and his strong desire to arrive at the truth. Dr. Prichard came to this conclusion—that while we may assign tolerably definite dates to the Exodus and the call of Abraham, yet if we interpret the antecedent records according to the usages of Eastern genealogies, there is no basis whatever for the received chronology; and he finishes with this remarkable expression—more remarkable from its having been used thirty years ago:—"Beyond that event, we can never know how many centuries, may have elapsed since the first man clay received the image of God and the breath of life." That was the judgment of a most honest, religious, and conscientious man, given on the basis of scientific and scholarly investigation, thirty years ago, before the present question came up.\* (Hear, hear.) I do not say that I was not prepared, through having been Dr. Prichard's intimate friend, associated with him in scientific inquiry, and asked by him to write a review of his work in the *Edinburgh Review*, for the results of later researches; I was quite ready to accept them; but, on the other hand, I had no wish to accept and adopt them. I protest against the assumption that scientific men have entered upon the consideration of these subjects with any other than

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\* Dr. Carpenter seems to be under the delusion that it is a kind of new discovery to theologians that the popular chronology will not hold water. I can assure him that this is a complete mistake, and theologians have long been aware of its difficulties, and of the uncertainty of the evidence on which it rests. Probably there is no writer of reputation who would affirm that the so-called received chronology from the building of Solomon's Temple upwards can be made out on a basis which will carry conviction. It is notorious that we have three different systems of chronology in the Hebrew, Samaritan, and Greek copies of the Bible respectively, involving a large period of time; and that the genealogical lists on which the popular chronology is founded are not complete. As to the real interval of time between the building of Solomon's Temple and the creation of man, theologians hold the utmost variety of opinion. As scientific men would object to be credited with popular opinions about science, and to be made responsible for them, so theologians ask at their hands that they will not credit them with the popular opinions about chronology. As also it is far from being the case that every person who volunteers to write on scientific subjects is a scientific man, so let not scientific men assume that every one who attempts to handle theological subjects is a theologian.—[Rev. Preb. C. A. Row, M.A.]

the one simple object of obtaining some addition to our knowledge of ancient man. There is an idea that men of science investigate scientific questions with a view of raising an antagonism to religion, and of forming a scientific clique to upset the Bible. This, to my mind, is a most unfair and unjust assertion, and one which I shall, on all proper occasions, feel it necessary to repudiate on the part of my scientific brethren and myself.\* (Hear.) We simply go into this matter of the flints as a question of scientific truth and evidence, and are all just as ready to welcome facts on the one side as on the other. With regard to what Mr. Whitley has stated, I have learnt a great deal from him to-night. The subject of the diffusion of these flint-flakes, on which he has enlarged, has opened up a number of new questions with respect to the causes of that distribution. (Applause.)

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\* Dr. Carpenter for the moment appears to have forgotten that there is some foundation for the "idea"; no one will accuse him or men of science generally of antagonism to religion, but Dr. Carpenter, as President of the British Association, at Brighton, in 1872, found it necessary to speak as follows:—"When science, passing beyond its own limits, assumes to take the place of theology, and sets up its own conception of the order of nature as a sufficient account of its cause, it is invading a province of thought to which it has no claim, and not unreasonably provokes the hostility of those who ought to be its best friends."

Commenting upon these words in the Preface of Volume VI. of the *Transactions*, we said,—“Attacks on revealed religion tend to injure the progress of true science, and it would be well if those, whose scientific labours are otherwise of no small value, were deterred by Dr. Carpenter’s remarks from continuing assaults made with the foregone conclusion that the Christian religion is unworthy of credence. Upon this subject generally, the Right Honourable W. E. Gladstone, in his address delivered at Liverpool College, in December, 1872, spoke as follows:—‘Belief cannot now be defended by reticence, any more than by railing, or by any privileges or assumptions. Nor, again, can it be defended exclusively by its ‘standing army’—by priests and ministers of religion. To them, I do not doubt, will fall the chief share of the burden, and of the honour, and of the victory. But we commit a fatal error if we allow this to become a mere professional question. It is the affair of all. . . . The combat is now with men who commonly confess not only that Christianity has done good, but even that it may still confer at least some relative benefit before the day of perfect preparedness for its removal shall arrive; and one of the most ‘advanced’ of whom . . . appears to be touched by a lingering sentiment of tenderness, while he blows his trumpet for a final assault at once upon the ‘Syrian superstition’ and on the poor, pale, and semi-animate substitutes for it which Deism has devised. . . . It is not now only the Christian Church, or only the Holy Scriptures, or only Christianity which is attacked. The disposition is boldly proclaimed to deal alike with root and branch, and to snap utterly the ties which, under the still venerable name of religion, unite man with the unseen world, and lighten the struggles and the woes of life by the hope of a better land. These things are done as the professed results, and the newest triumphs of modern thought and modern science; but I believe that neither science nor thought is responsible, any more than liberty is responsible, for misdeeds committed in their names.’”—[ED.]

Capt. F. PETRIE.—Mr. Borlase will be called upon to speak on the other side ; but before the Chairman asks him to do so, I am anxious to say that we are in danger of going astray in the discussion, through a misconception with regard to the flint-flakes brought here by Mr. Evans, and which Dr. Carpenter asserts, in the name of common sense, to be artificial. Mr. Michell fully grants that they are, so will every one present ; but he holds that there is a great difference between them and the naturally-chipped flints of the Drift, in other words, he holds that there is a great difference between the flakes which are arranged on each side of the chairman ; the one set he holds as being naturally, the other artificially, chipped.

Mr. WILLIAM C. BORLASE.—I will confine my remarks to the smaller flint-flakes which are scattered broadcast over the surface of Cornwall. These, as a geologist, I have always considered as nothing more nor less than the insoluble residue of the soluble chalk. They are “leavings,” not “bringings.” In this opinion I have been confirmed by some recent remarks of Mr. Etheridge, who speaks of the cretaceous beds extending, in his belief, at one time over the whole of the west of England. “In Devonshire,” he says, “we find piles of flint upon the upper greensand, the chalk being gone.” In Cornwall, we find these flints broken—broken I cannot say how, but with the bulb of percussion sometimes shown upon them—along with pebbles of this very same upper greensand. There is one remarkable thing about them, and that is, that if any of you were to go to different parts of Cornwall, and put the flints you gathered there into three or four different piles, I could tell you the district from which each of them came, owing to the manner in which the colouring of the different beds has apparently affected them. I have found these flints in their simplest forms as flakes, not only on the surface, but in the barrows and urns of the dead, mixed up with the ashes of the funeral pyre, and in these cases sometimes they are artificially chipped ; but as a rule they are simple flakes, such as I see before me. Some of the flakes have been burnt with the ashes, and in these cases they may have been what Mr. Evans declares some of them to be—the “strike-a-lights” for the funeral pyre. But all we can gather from this is that man knew the whereabouts of these several deposits, and recognized their utility for the several purposes in which he could employ them, sometimes as a simple arrow-head, and sometimes as the means of striking a light for his fire. When he found that they were not quite suitable in shape, he may have chipped them a little, and thus it may be that we often find chipped ones along with the others. We find arrow-heads as good as those of Scotland, side by side with these simple little flakes ; but surely nature may sometimes be allowed to have rivalled the ingenuity of man, and to have imitated his handiwork so far as to form a simple flake. What others nature has left, man has wrought out more completely for his use.

Professor TENNANT.—I have very little to say upon this subject, except with reference to a statement that has been made as to the variety of materials of which implements are composed. This is due in reality

to the localities in which they are found. If we go to New Zealand, we find that there they used jade; that in the Channel Islands they used basalt; in Mexico, the natives used obsidian, while in other countries substances of a like kind, chiefly siliceous, were employed in the formation of implements. With respect to the specimen in my hand, this was certainly not made by accidental causes. It is partly manufactured, and by no ordinary process of bringing two or more things accidentally together, could it have been converted into such a hatchet as it now appears. This (showing another flint) is in a transition state; this (showing another) is a piece of jade, which has been cut on one side and broken on the other. In the case before me I have some of the handiworks of that notorious individual called "Flint Jack." This (holding up a stone) I saw him make, and here are other illustrations. There is no doubt that many of the stones referred to by Dr. Carpenter have been manufactured, and many of the others which you may pick up by thousands in different places, have been produced by the knocking of one against the other. Your Lordship (the Chairman) has just returned from Egypt, where no doubt you found the agates on the plains actually polished as if by the lapidary. Some specimens that have been brought to me by travellers illustrate this in a remarkable degree. The subject would, however, be a long and tedious one to go into, especially after the matter has been so fully discussed on both sides, although, if there were more time, I should be happy to add what I could to what has already been said.

Mr. E. CHARLESWORTH.—I should like to say just a few words upon one point, with regard to the beads, which I think ought not to be altogether overlooked in this discussion. Mr. Whitley held up a string of beads with an air of triumph, and seemed to think he had made a grand hit in catching the advocates of the Palæolithic implements found in the Drift in a great mistake. I do not wish to speak in an irreverent spirit of Mr. Whitley's paper, but it struck me that what he told us was like the production of the play of Hamlet, with Hamlet himself omitted. He intimated that the beads he held up had been regarded as Palæolithic beads. Now, I would ask, who is there among the whole range of men of science who have written on this question, who has said that those beads are Palæolithic beads? Who has ever said that they were the work of Palæolithic man?

Mr. WHITLEY.—Sir Charles Lyell.

Mr. CHARLESWORTH.—I would ask where Sir C. Lyell, Sir John Lubbock, Prestwich, Stevens, or any man of science whose opinion carries the smallest weight, has so stated? Those so-called beads are beads only to the common and vulgar apprehension, and everybody who has at all studied the subject knows that they are fossilized organic bodies, which in many cases do appear to simulate human workmanship. I again assert that no man of science who has ever written on the subject, has ever for a moment put those so-called beads forward as strengthening the theory with regard to the existence of Palæolithic implements. There is one suggestion I would offer, and that is this: like Dr. Carpenter, I am no archaeologist, my attention not having been given to the subject. But I went to Norwich, and in the museum of

Mr. Fitch I saw a collection of flint implements from the gravel-bed of the Little Ouse. I said, "Here are certain shapes which to my mind convey the impression that they are of human workmanship, but how far will that impression be modified when I get to the gravel-pits in which the implements were found? Shall I find single specimens myself, or shall I find that there are dozens or scores like these, and so be able to connect the ordinary form of the gravel flints with these flint implements?" I went down to those gravel-beds, and the result was that I did not succeed in meeting with a single specimen of these flint implements, nor did I meet with any form of flint which seemed to connect those in Mr. Fitch's cabinet with the ordinary flints in those pits. Now, if the flints belonging to Mr. Fitch's collection had been produced by accidental fractures, what should I have found? Why, every possible link between those specimens and the ordinary forms of which the gravel-beds were composed.

Mr. WHITLEY.—So you can.

Mr. CHARLESWORTH.—No, there was a wide gap between the two, and I give this as a practical illustration of a fact which every one present can test for himself.

Mr. WHITLEY.—I beg to say that Sir Charles Lyell does state that he thinks it reasonable to assume that these beads formed the necklaces of Palæolithic men. He does not say so in so many words in his text; but he puts it at the head of one of his pages in his book on *The Antiquity of Man*.\*

Dr. CARPENTER.—Perhaps, as I have paid special attention to this subject, I may be allowed to say one or two words upon it. I have brought with me one of these supposed Palæolithic relics, and it is rather larger than Mr. Whitley's. The "beads," as they are termed, are, no doubt, organized bodies, and there is also no doubt that they grew in this globular form. I apprehend that they grew very often round the stem of a zoophyte, and that this left a natural perforation. Here are some that were picked up by Mr. Prestwich, at Newhaven, and in their case you will see that the natural perforation often does not go through. I do not say that all these perforated beads were artificially bored; I only say that Mr. Whitley has not disproved the probability that some of them were. If you go to any chalk district and pick up a number of these things, you will find that some have a hole right through, while others are merely dimpled. It is of course a curious circumstance, supposing this statement to be true, that only the perforated ones

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\* Sir Charles says, "Granting that there were natural cavities in the axis of some of them, it does not follow that these may not have been taken advantage of for stringing them as beads, while others may have been artificially bored through. Dr. Rigollot's argument in favour of their having been used as necklaces or bracelets, appears to me a sound one. He says he often found small heaps or groups of them in one place, all perforated, just as if, when swept into the river's bed by a flood, the bond which had united them together remained unbroken." (*Antiquity of Man*, 4th ed., p. 166.) The page is headed, "GLOBULAR SPONGES ARTIFICIALLY PERFORATED."

should have found their way into one place. The idea that these globular bodies were employed as necklace-beads is in a measure justified by the fact stated to me by a gentleman formerly in the Indian medical service, and who has made many valuable researches into the geology of India,—that the inhabitants of Cutch are in the habit of stringing similar things together, and wearing them as necklaces. I do not lay any stress upon this, but at the same time I do not think that Mr. Whitley, by producing three or four specimens of these necklaces made of selected natural beads, has altogether disposed of the matter. For myself I do not think that the beads alone should be taken as evidence of the existence of man at the remote period with which they are identified.

Mr. EVANS.—Mr. Whitley has asked whether marks of wear are found on the Palæolithic implements? I reply that the marks of use found on the edges of the flakes and on the edges of the implements discovered in the sand-beds are identical in character with the marks on the flints of a much more recent period, which have evidently been used for scraping hard substances. Mr. Whitley has asked me to point out the sins of which I accused him. They were rather sins of omission than sins of commission. He has cited the beds of Cissbury-hill and Spiennes as containing large numbers of flakes in what he regards as a natural deposit. He ought to know that at those places, pits were found to have been sunk into the chalk for the purpose of obtaining flints to manufacture into flint implements, and that in those pits stag's-horn pickaxes were found—evidence which he ignores. He should have known, too, that implements of a pointed form have been found in Gray's Inn Lane, and that at Hoxne similar implements, regarded as spear-heads have been discovered. I, myself, bought one at a sale by auction, labelled as a British spear-head, about the human origin of which there could be no question.

Mr. MICHELL.—At this late hour, I will not detain the meeting long in replying to what has been said. I will only direct attention to the two crucial tests which I have ventured, although, I fear, very feebly, to bring before this meeting. I have spoken of the contrast between the rude chipping, as seen in the Drift types, and that which is seen on the javelin and spear-heads, as shown even on the worst specimens of the Neolithic implements. Taking the Drift flints, you find that the same type prevails throughout, and is as patent in the best specimens in the world as in the roughest I ever picked up. Examining the specimens in the museums, the flints in the beds themselves, and the chipping on shattered flints where the so-called implements are found, I say that the evidence is very strong, and, to my mind, convincingly so, that this chipping on the Drift flints is natural, and not artificial. Compare these again with the specimens belonging to the Second Stone period, where the chipping is undoubtedly artificial, and the contrast is striking. I have asked artisans and flint-knappers, and even "Flint Jack" himself, to make something like this Drift chipping, and they have told me they could not do it. I believe them. 'Now, I do say that this is something of a test. I ask you to look at the sort of action that takes

place where sand is combined with water and both act on the surface of a flint; examine the pieces that are found with no definite form in the sand-beds of Brandon, or wherever you like to go—they may be seen over miles of the Norfolk coast—and I am sure you will say that my view of the chipping is the common-sense view, in the common-sense aspect to which Dr. Carpenter has referred. (Hear, hear.) I have done.

Mr. W. T. CHARLEY, M.P.—I beg to move a vote of thanks to the Earl of Harrowby for his great kindness in presiding this evening. (Cheers.)

The motion having been seconded, and carried unanimously,

The CHAIRMAN said,—In thanking you for the vote you have just passed I must apologize for having come here at all this evening, having no pretensions, from the previous direction of my studies, to assume such a position; and I should not have assumed it if I had been expected to do more than occupy the chair. Perhaps, however, it may be allowed me, with no pretensions to skill in these matters, to say, so far, that it appears to me to be one of the cases in which antagonism is not quite so real as appears. On the one hand, the very wide range over which these flint-flakes are found, and their enormous numbers, seem to prohibit the conclusion that they are the work of man, and to favour the opposite view, that they must be the result of natural agencies. On the other hand, the forms in which many of them present themselves are so artificial, that it seems impossible not to come to the opposite conclusion. It seems to me to be a question of the analysis of the facts, rather than matters of argument and reasoning, and that such a process is almost impossible in a meeting like the present. It is certain that there are many cases in which Nature produces results so closely resembling the work of man that it is difficult to draw the line with confidence, and to say, this must be the work of man, and this other may be the work of natural causes. In the valley of the Nile, I have seen instances where flinty substances are in that condition, so placed that apparently they could not have been the work of man, and yet so shaped that it was difficult to see how they could have been the result of natural causes. The action of heat and wind, and water and sand, upon the softer portions of a substance, and with some uniformity, seems to produce results which wonderfully resemble the action of art, and puzzles the observer. I do not see that we are yet able to come to a positive conclusion on all the facts presented to us.

The proceedings then terminated.

## REMARKS.

Rev. S. LUCAS, F.G.S.—Notwithstanding the disclaimer of Dr. Carpenter, which I fully accept for himself, and for such distinguished scientists as the late Dr. Buckland, Sir R. I. Murchison, and geologists of their class, there is among many I could name, not only a bias, but what amounts, in appearance at least, to a determination to uphold and push back man's enormous antiquity on most feeble and limited grounds ;\* to rest it on a few and often ques-

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\* Upon this point, Dr. Dawson, F.R.S., in his work *Acadia*, says—  
 “In a region whose history extends backward scarce three hundred years, prehistoric times may seem to have little interest, in so far as the human period is concerned. Yet I think that something may be learned at a time when prehistoric human remains are exciting so much attention in the old world, by referring to the more recent ‘Stone age’ of Acadia. Those who speculate as to the antiquity of man, and the ages of Stone, Bronze, and Iron in Europe, and who, looking back on the earlier of these periods through the mists of centuries, attach to it a fabulous antiquity, may derive some lessons from a country in which the Stone age existed three hundred years ago, and has yet passed away as completely as though it had never been. The Micmac still pitches his rude wigwam of birch bark within sight of the largest cities of Acadia ; but he has entered into the Iron age, and the stone weapons of his ancestors are as much objects of curiosity to him as to his neighbours of European origin. \* \* \* \* \*

“Such was the Stone age of three centuries ago in Acadia ; and it is instructive to bear in mind that in a country in the latitude of France, this was not only the Stone age, but also the age of the caribou or reindeer, and moose and beaver—animals now verging towards extinction, and of no more importance to the present inhabitants than the park deer are to those of the old world. With the exception of a few of the forest-clad, hilly districts, Nova Scotia is now as unsuitable to the existence of the reindeer and moose as France is, and yet three centuries ago these animals were the chief food of its inhabitants. No material change of climate has occurred, but the Iron age has introduced a new race, and the forests have been cleared away. \* \* \* \* \*

“The monuments of the Stone age are few. Piles of shells of oysters and other mollusks, in some parts of the coast, mark the site of former summer encampments. Numerous stone implements are found on some old battle-grounds or cemeteries, or on the sites of villages ; and occasional specimens are turned up by the plough. But this is nearly all ; and if the written record of the discovery and colonization of the country did not prevent, we might, in so far as the monumental history is concerned, believe the close of the Stone age to have belonged to a remote antiquity. If the Micmacs had been replaced by a semi-barbarous race, not keeping written records and destroying the aborigines, or incorporating them with themselves, the date of the Stone age would already be altogether uncertain.

“On the whole, nothing can be more striking to any one acquainted with the American Indian, than the entire similarity of the traces of prehistoric man in Europe, to those which remain of the primitive condition of the American aborigines, whether we consider their food, their implements and weapons, or their modes of sepulture ; and it seems evident that if these prehistoric remains are ever to be correctly interpreted by European

tionable facts, and facts which readily admit of being accounted for in harmony with Scripture. I am reminded, however, by the discussion itself that the question is not the broad one of man's antiquity generally, but the *validity* of a branch of the evidence on which that antiquity is sought to be based. Clearly and fully to record my own views on that branch of the evidence, would require an essay. It stands so intimately connected with many other questions, that it can scarcely, with any satisfaction, be discussed separately. I may, without presumption, be permitted to say that my own views on the whole question, which I have long held, and which I have seen no reason to alter, are fully stated in my two last works, *The Biblical Antiquity of Man*, and *The Noaic Deluge*.

With regard to the precise point in dispute, my opinion is, that although vast numbers of the so-called flakes, perhaps *far the greater part* of them, are mere natural productions, yet that many of what are called implements, such, for example, as those exhibited by Mr. J. Evans, and those obtained by Col. Lane Fox, near Acton, are of human origin. But if their *non-artificial* origin could be proved, should we gain anything in the grand dispute itself. The beds from which the implements are obtained have also yielded animal bones—bones of creatures proved to have been contemporary with man—and hence, to disprove the validity of the implements would only remove a part of the evidence of antiquity.\* No, the superstructure must embrace a much *wider foundation* than the one brought before the members of the Institute by this discussion. What is meant by the *Drift*? This term is most indefinitely—and, I may add, confusedly—employed by writers and speakers on man's antiquity. Very often it is made to include the *boulder clay*, as well as all of the other overlying deposits, except the most recent ones. The *true Drift* I regard as embracing all the deposits of brick-earth, gravel, and inundation mud—whether in valleys or caves—that are clearly subsequent to the *glacial period*.

*These form the human period*, whether called Palæolithic or Neolithic, but a period cut into two unequal but prolonged epochs by the Biblical Deluge. And to come to a safe and really philosophical conclusion on this all-im-

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antiquaries, they must avail themselves of American light for their guidance. Much of this light has already been thrown on this subject by my friend Professor Wilson, in his *Prehistoric Man*; but one can scarcely open any European book on this subject, or glance at any of the numerous articles and papers on this fertile theme in scientific journals, without wishing that those who discuss prehistoric man in Europe, knew a little more of his analogue in America. The subject is a tempting one, but I must close this notice, already too long for the space I should devote to it, by remarking that the relations in America of the short-headed and long-headed races of men, are by no means dissimilar from those of the two similar races in Europe; while it is also evident that some prehistoric skulls, supposed to be of vast antiquity, as, for instance, that of Engis, bear a very close resemblance to those of the Algonquin and Iroquois Indians."—[Ed.]

\* See note, page 40, No. 3.

portant subject, now agitating all thinking minds, the whole evidence of this period must be collected and weighed. To conquer a portion of the field may be useful, but the whole must be conquered before perfect satisfaction can be felt.

S. R. PATTISON, Esq., F.G.S.—My opinions agree rather with those of Mr. Evans than those of Mr. Whitley ; but having examined the known collections of flint implements, I do not think the facts established by them really militate against Scripture statement or Scripture chronology. True, those who with other views seek to advocate a theory destructive of Biblical chronology, may adduce the facts and assume extended periods, and, the wish being father to the thought, argue for a contradiction. But all the facts of the last mammalian period, in which these evidences of man are discovered, may be synchronized with Scripture. *The annals of Genesis afford time for all the geological and palæontological sequence*, so far as the flint tool makers are concerned.

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### THE "FLINT IMPLEMENTS IN THE VALLEY OF THE SOMME."

Being a revised and corrected report of a paper recently read by Mr. JAMES PARKER, F.G.S., &c.,\* before the Ashmolean Society at Oxford.

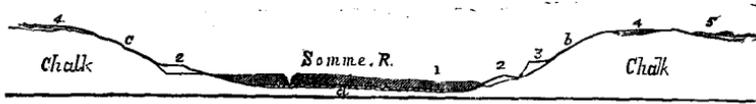
Mr. PARKER said that what he proposed to do was, to point out some of the links in the argument which he thought had not received the attention due to them in comparison with other details introduced into the chain of reasoning, as to the immense antiquity of the flint implements in question. He could not hope, indeed, he did not propose to attempt to explain, the many and varied phenomena presented by the Somme Valley, or to fix the exact age of the beds bearing the flint implements ; but he hoped at least to bring forward some considerations which had not been fairly discussed, and which, if founded upon fact, as his observations, he trusted, would show to be the case, militated considerably against the views which were commonly held, and of which Sir Charles Lyell was the chief exponent.† He thought he would best consult the convenience of his audience by giving to them, in Sir Charles Lyell's own words, the chief points in his argument. His work was practically the summing-up of what authors, both English and foreign, had written, together with conclusions derived from his own personal observations. In his book a section of the Valley of the Somme was given. He was sorry to say that as a matter of fact they could place no reliance upon it whatever, as it differed in many respects from the actual circumstances, but it was necessary to reproduce it there in order to illustrate Sir

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\* Mr. Parker has kindly placed this in my hands.—[ED.]

† Professor Kirk, in his *Age of Man*, p. 23, takes the same view as Mr. Parker.—[ED.]

Charles Lyell's theories. Quoting from *The Antiquity of Man*, p. 151 (edition of 1873), he read :—



Section across the Valley of the Somme, in Picardy.

(From Lyell's *Antiquity of Man*, 4th ed.)

1. Peat 20 to 30 feet thick resting on gravel, a.
2. Lower-level gravel with elephants' bones and flint tools, covered with fluvial loam, 20 to 40 feet thick.
3. Higher-level gravel, with similar fossils, and with overlying loam, in all 30 feet thick.
4. Upland loam, with shells (*Simon de Plateaux*), 5 or 6 feet thick.
5. Eocene tertiary strata, resting on the chalk in patches.

"The chalk hills which bound the valley are almost everywhere between 200 and 300 feet in height. On ascending to that elevation we find ourselves on an extensive table-land, in which there are slight elevations and depressions."

At p. 152,—“Here and there are outlying patches of tertiary sand and clay (bed No. 5), with Eocene fossils, the remnants of a formation, once, more extensive, and which probably once spread in one continuous mass over the chalk, before the present system of valleys had begun to be scooped out,— . . . and their denudation has contributed largely to furnish the materials of gravels in which the flint implements and bones of extinct animals are entombed.”

At p. 153,—“The bed marked No. 2 indicates the lower-level gravels, No. 3, the higher ones, or those rising to elevations of 80 or 100 feet above the level of the river. Newer than these is the peat, No. 1, which is from 10 to 30 feet in thickness, and which is not only of later date than the alluvium Nos. 2 and 3, but is also *posterior to the denudation of those gravels, or to the time when the valley was excavated through them.*” “Underneath the peat is a bed of gravel from 3 to 14 feet thick, which rests on undisturbed chalk. This gravel was probably formed, in part at least, when the valley was scooped out to its present depth, since which time no geological change has taken place except the *growth of the peat*, and certain oscillations in the general level of the country.”

These were briefly the materials for the computation. So many years were ascribed to the peat deposit (this Dr. Lyell placed at 33,000) ; so many in addition for the excavations which had taken place of the valley ; and so many for the deposition of the gravels, marked respectively No. 2 and No. 3. Practically these operations could only be summarized as a whole, and it was only by an induction from a passage elsewhere in his book that they found he computed the time for all these operations somewhere about 70,000 years. At the base, and intermingled with the lowest deposit, were the implements in question.

Although not directly part of the subject before the meeting, he thought it well to say a few words about the 33,000 years of the peat, as it was an important item in the total, and it also afforded a typical instance of the *mode* in which arguments were forced into the service of the author.

He read (p. 156),—“The workmen who cut peat or dredge it from the bottom of swamps and ponds, declare that none of the hollows which they have found or caused by extracting peat have ever been refilled, even to a small extent. *They deny therefore that the peat grows.* This may imply that the increase is not appreciable.”

Mr. Parker could only say that on asking a couple of men who were

working at M. Tattegrain-Brulé's pit (and who had worked in the peat pit at other times) as to the depth, &c., of the peat, their account distinctly was that it *did* grow. He had not pressed the point at all; the only questions he asked were as to the total depth, and as to what was at the base of the peat. The men agreed that it rested on the chalk, and was nowhere more than nine metres thick. M. Tattegrain-Brulé corrected them so far as to say he knew of places where it was over 30 feet thick, and what was to the present purpose as regarded Sir Charles Lyell's statement, they said that the peat was still growing or forming, and that about a metre in a century was the rate, according to their idea. His own conclusion in 1861 was that this was possibly an average estimate, because when they were altering the moat surrounding Abbeville he observed that there was a deposit of some two or three feet of peat in it, which they were clearing out, and he thought that they would at least have cleared their moat once in a century. This was not far from the Porte Mercadet, a place often referred to in the account of the discoveries.

He might mention the computation which was made for the growth of the peat in Ireland. This was, according to Mr. Griffiths, *two inches* in depth in *one year*; but this was an excessive growth, and under peculiarly favourable circumstances. But before taking such data—the workmen's, which would give at a metre one thousand years for the whole 30 feet, and Mr. Griffiths' computation, which would, under favourable circumstances (and in many places the Somme Valley presents these), leave it possible for the whole 30 feet to have been deposited since the commencement of Queen Anne's reign—he thought it well to call attention to an important consideration which affected materially any computation derived from peat-growth, namely, the intermittent character of the growth—its rapid growth at one time, its slow growth at another, and entire stoppage at others. When the peat, during growth, reached the highest level at which water would stand in any given locality, it naturally ceased to grow. From its character it could not raise itself to any great degree above the element on which it mainly depended for its growth. Of course, it might be in the varied incidents of a long valley that the stream for some cause was kept back, but that could not be for long. The weight of the water would eventually break a course through the obstruction, and then the peat formed at the highest level would sink by reason of evaporation and its own weight, and become more consolidated, and form distinct beds of varied densities, such as existed in the peat, and which pointed to that intermittent character of growth. Consequently, until they knew what periods of rest took place, all computation was impossible, as the facts derived from the observation of incidental growth might have such a relation to the whole as to be not worth taking into account.

Mr. Parker's view was, that only in a very few cases was there any material growth of peat, such as when the water stood sufficiently above its surface as to supply the means of growth; and that then it was very rapid, the conditions being as favourable as those in Ireland; and it followed, therefore, that as the peat grew higher in the valley—higher, that is to say, in regard to the sea-level—so, fewer occasions would there be of the water lying at a sufficiently high level to induce growth; and from this the probabilities were that in the earlier history of the peat, the occasions being more frequent, the beds would increase as a whole far more rapidly than they did now.

He next turned to Sir Charles Lyell's computation. This writer had selected the argument from M. Boucher de Perthes' evidence, and though he said "we must hesitate before adopting it," he gave it as the only one of any value, and did not intimate the least wherein any fallacy lay. It was given at p. 156.

"In one case, however, M. Boucher de Perthes observed several flat dishes of Roman pottery, lying in a horizontal position in the peat, the shape of which must have prevented them from sinking into or penetrating through the underlying peat. Allowing about fourteen centuries for the growth of the superincumbent vegetable matter, he calculated that the thickness gained in a hundred years would be no more than *three French centimetres*. This rate of increase (Sir Charles Lyell added) would demand *so many tens of thousands of years* for the formation of the entire thickness of 30 feet, that we must hesitate before adopting it as a chronometric scale."

It was obvious that 0·03 metres in a century required upwards of 33,000 years to give the 10 metres, which in some places existed in the Somme Valley. The point he would lay stress upon was, that the hesitation to accept this should not have been made to arise from the result which it gave, but from the fact that the data were so obviously worthless for forming any calculation at all. The absolute but erroneous assumption that continual formation of peat went on at one uniform rate, was the basis of the whole argument. This pottery was found, so it was stated in M. Boucher de Perthes' book (*Antiquités Celtiques*, ii. p. 135), to be 0·60 metres (nearly 2 feet) below the surface. This writer argued further that much of the peat being impure, the factor had to be reduced to one-fourth, *i.e.*, to 0·45. Now, Samian pottery, it was argued, must be 1,400 or 1,500 years old. It was assumed (a) that at that distance of time it was (b) placed gently on the surface of the turbarry so as not to sink through, and (c) circumstances were such that it was not buoyed up, and (d) that the peat from that moment down to 1863, had gradually, and at one uniform rate per annum, grown over it. Any one of the conditions of course being liable seriously to affect the factor, they were supposed to accept all, and thereby obtain a factor to apply generally to the growth of the peat throughout the Somme Valley. If this was not what was meant by Sir Charles Lyell's argument, nothing could be gleaned from it at all. The lecturer then proceeded to consider the next elements for the computation of the time which had elapsed since the deposition of the implement-bearing beds. Without quoting new passages, the words already given showed the line of argument, namely, "that the peat was posterior to the time when the valley was excavated through the gravels."

It was in vain to look for any figures of computation for such excavation, although elsewhere in Sir Charles Lyell's book (p. 367) it was intimated that the upper and earliest of these gravels were the equivalents probably of beds 100,000 years old, no arguments were forthcoming as to the means of computation. Indeed, it seemed beyond all calculation. Imagine the rate at which a trickling stream could excavate and grow into a large one, and carry down the material of a valley 115 miles long, and varying from one mile to ten miles broad. Imagine the millions upon millions of tons of chalk and of other material to be scooped out and carried along and deposited in the sea. The time was certainly beyond all calculation, and the 67,000 years, he was sure, would be found by any one who considered the problem carefully to represent but a mere unit in the time required under the circumstances.

But then the question forced itself on one, "Was the Somme Valley excavated by the Somme River at all?" Not one line would be found in evidence; it was assumed purely and absolutely, and on that assumption alone were based all the arguments as to time, which were put forward.

In considering the hypothesis of the excavation of a valley of this kind by means of a river, the first question to be asked was naturally, "Where did the water come from?" Considering the vast surface to be removed, it was necessary to have a supply of water of enormous quantity and of constant flow. And much more than that, it was necessary to have an impetus given to that water by a fall or gathering together of streams to give it force sufficient

to remove, and propel the loosened material forward in its downward progress to the sea.

Two minor considerations also might be mentioned which in a full investigation of the phenomena should not be overlooked, though the scope of the present argument would not allow of any further remarks upon them. First, a certain amount of slope of the bed of the valley from its highest to its lowest point must be necessary, for below a certain incline water would not move large masses forward to any extent. Now, the bed of the Somme valley was singularly level for a wide river, there being a fall of little more than 200 feet from the the source of the Somme to the sea, a distance of 115 miles; in fact, the fall was hardly above that of the Thames between Oxford and London, and the distance was the same. Second, there was the consideration of the difficulty of accounting for the disposal of the materials when they reached the river's mouth. He had examined very carefully the district at the mouth of the Somme, and could say that they were not deposited there, nor were there any signs of them. Nor yet was any *à priori* ground for arguing that the waves had washed the *débris* into their depths. The history of the coast was directly opposed to this, as the waves were throwing up sand-dunes, and had been so since the earliest times of which they had any record regarding that coast.

Mr. Parker then referred to a large diagram which he had prepared, and on which he had traced the main line of the Somme, with its several arteries — representing by broad lines of colour the several valleys converging into the main valley. The district represented on the diagram was about 140 miles from east to west, and about 60 miles from north to south. At the eastern end it would be observed that the Somme was simply a small stream, scarcely to be called a river in a strict sense. Of course, it was in a way the river Somme, because they considered the source of a river to be the point of departure of the farthest of the numerous streams which go to make up that river, and in most cases it was little more than water trickling along a ditch from some spring. But the word river in its natural sense means the stream of water after many smaller streams had been combined together, and had contributed each one its quota to form the larger one. The history of nearly all rivers was this, and the Somme was no exception. It depended on the drainage of many sloping valleys converging into the main valley. At the upper part it was a brook, and it did not become a river properly so called, till it had received the converging rivulets of many small valleys. Till then it was no river; it had no force whatever. It was necessary for the converging valleys to be there to supply the water; it was necessary for the valley to exist to supply the fall; so that when they were asked to accept that the river Somme made the valley of the Somme, it seemed to him they were asked to believe that the river made the conditions by which itself was called into existence.

It was unreasonable, on the other hand, to imagine high hills, pouring forth a stream of water above S. Quentin. They could not have existed without so total a subversion of the levels of the country, that there would be no need of calling in the aid of river action to account for valleys twice as great as the Somme valley. But as a matter of fact, geologically, such lofty hills could not have existed without leaving a trace behind them.

Looking at the great system of arteries shown in the diagram, the ground to the south-east was *on an average* higher than that to the north-west. There were here and there hills of the same height, or almost the same, along the whole line, and they were broken up by innumerable valleys and "combes"; but by taking the average from a considerable number it would be seen that there was a general slope, as regards the higher prominence, in a north-westerly direction. The hill rising immediately above the source of the Somme, five miles N.E. of S. Quentin, and at a place called from the

circumstance "Fon-somme," only reached 308 feet in height above the level of the sea, and the drainage of this alone supplied the upper tributary. Three miles to the south-east was a hill reaching 400 feet; but it appeared to add little, if anything, to the supply. They would have to go several miles to obtain a higher level, and directly they reached it they found that it no longer supplied the Somme; but the Aisne and the Oise, which were tributaries of the Seine, and belonged to a distinct system. If they continued their search for still loftier elevations, they would, still proceeding in a south-easterly direction, find hills rising to 800 and 900 feet; but they gave off their streams to tributaries of the Meuse, and they would be obliged to follow their waters through Holland before they were discharged into the sea. In a word, the whole system depended upon the water-sheds of the hills rising only to 300 and 400 feet above the level of the sea. The Somme depended mainly for its water upon the combined supplies of its chief tributaries, the Avre, the Noye, and the Celle; but all along its course it was assisted by numerous smaller streams gathering the rain-water which fell upon the slopes of the numerous ravines descending into the main valley.

But connected with the Somme system, it was pointed out that there were several parallel rivers following the same course as the Somme, *i.e.*, descending from the south-eastern ridge in a north-westerly direction. To the north the Authie, and to the south the Bresle, the Yeres, the Eaulne, and the Bethune. They depended also upon the same sources of water, and were in every respect similar in their circumstances, and could scarcely have been different in their origin. If it were objected that springs now no longer in existence might have originally supplied a much larger body and a much greater force of water than now, it must be remembered that the district was a chalk district. Each ravine was as a rule dependent upon the rainfall of its own slope. All that could be done, therefore, was to increase the rainfall, and add, what perhaps there might be independent reason for adding, heavy snowfalls, and of long duration, by which the April suns provided an amount of water far in excess of what was thrown down the ravine now. And yet that would affect the argument but little, because the sloping ravines converging to the great general valley must have been already there before the excessive rainfall or snowfall could be of any value. The sudden melting of snows on large flat expanses produced no material results; it was the valley, the ravine, and the gully which gave the force to the water, and without them the water but evaporated into the atmosphere or soaked away as best it might.

It was not a part of his task then to explain the phenomena of the Somme valley; but with that map before him he felt called on to say a few words as to the operations which he thought it suggested. He might add that the view he took was based not only on the data then before them, but upon the study of the levels of the Ordnance Survey in a much more minute degree than was represented by the figures on his diagram, and beyond this by many a tramp over the hills in question, sometimes in geological excursions, more often archaeological. The great parallel lines of rivers, the furrows as it were stretching in a direction similar to that of the sloping chalk, suggested that the river valleys belonged to the operations consequent on the upheaval of the great mass of chalk from its ocean bed. He compared the result with what any one might see on any argillaceous shore, where the base was impervious and yet soft. The descending tide left channels and furrows, by which the surface was drained, but afterwards modified in character by evaporation and exposure to atmospheric influence. The great chalk expanse of a hundred miles was enormous in comparison to the few yards of a tidal shore, and so were the valleys of 100 and 200 feet depth to the little drifts of two or three inches. But this was not all. If it were argued that the effect was not proportionately sufficient, it might also be reasonably replied that the emergence of this vast

chalk-bed from the ocean was probably not of that passive character which belonged to a tide receding from the shore ; but it might well have been the result of active elevation of the chalk, and such elevation could scarcely have been unaccompanied by fissures and inequalities which, as a rule, would lie, as regards their greater intensity, in lines at right angles to the main axis of elevation. That was just what those valleys did, and the minor fissures represented by the smaller ravines lay again in a general sense at right angles to them, as might be seen by a glance at the Ordnance map before them, on which the valleys were slightly tinted. The general aspect of the Somme valley and its tributary ravines pointed distinctly to operations connected with the rising from the ocean bed. Whether that took place in tertiary or post-tertiary times, whether once or more than once, were not questions with which he had now to deal. All he would lay stress on was that those rivers and valleys, and among them the Somme river and Somme valley, did not owe their origin to the slow excavation of river action, and therefore the assumption of that action, as a measure of time in connection with phenomena which the valley presented, was an absolute error.

He next passed on to the consideration of the deposition of the gravels. Practically the two arguments were based upon the same premise. The current of the Somme excavated the valley, and in doing so deposited the upper-level gravel. It afterwards excavated the upper-level gravel, and deposited the lower-level gravel. It afterwards excavated that gravel, and the 33,000 years of the peat-formation set in. At least, this was what was meant if there was any meaning in Sir Charles Lyell's argument at all. It was difficult to quote one single passage stating this. At p. 168 there was a good deal about beds 1, 2, and 3 ; but it would be found that the reference was to another set of beds in another section and in reverse order. And yet the descriptions were intended to be a continuation of the same argument. Again at p. 173, in referring to the first section for comparison with the Menchecourt beds, he spoke of No. 2 as the lower-level gravel, and No. 3 as higher alluvium ; but at p. 169 the low-level beds at Menchecourt were spoken of as the older alluvium. He could not but think that if a clearer explanation of the phenomena had been given, the fallacies involved in the conclusions would have presented themselves to the mind of the readers if not to that of the compiler of the book.

Before quitting this part of the subject, Mr. Parker referred to the passage at p. 186, where it was said there were "patches of drift at heights intermediate between the higher and lower gravel, and also some deposits showing that the river once flowed at elevations above as well as below the level of the platform of S. Acheul." He pointed out how practically the line of demarcation between high and low level gravels did not exist in fact, and that the argument therefore in regard to age derived from this difference of level was wholly untenable.

Having treated of the general aspect of the Somme valley as regarded the evidence for the antiquity of the implement-bearing beds, he gave an account of the position of the beds in a particular district, namely, that of S. Acheul, about  $1\frac{1}{2}$  mile east of Amiens, a district said to have yielded more of the flint implements in a small space than any other.

The plan exhibited some ten or twelve pits or cuttings in a space of about one mile from east to west, and three-quarters of a mile north to south. The levels of the surface of pits were marked, and a series of coloured sections of the sides of the pits, &c., drawn to scale. From these it appeared that while there was a gentle slope of the surface of the ground towards the south, there was a very rapid descent of the underlying chalk in a particular part, and in this hollow there had been the accumulation which contained the flint implements. The actual section presented a "combe" in the chalk filled up nearly to the level of the sides with gravels and sands, not stratified

horizontally, which would have been the case had they been the result of deposit in a wide expanse of river, nor following any line suggested by possible current action.

He pointed out also in several instances, that in a general sense the gravels were dependent on the chalk contours, but presented also the kind of inequalities which would arise from subaërial action. The surface materials seemed to have fallen, slipped, or drifted into lower levels, and arranged themselves partly according to their relative gravities, partly, as said before, according to the ground on which they fell or over which they passed. And finally the varied action of wind drifting the surface sand and loam, of rain washing and separating lighter materials, and the possibly far more effective action of the melting snows, in loosening, shifting, and undermining the previously formed gravel—all those causes, coupled with the fact that they were no doubt intermittent, and acting only at perhaps long and irregular intervals, were necessary to be taken into account in understanding the various phenomena which were seen in the details of the sections. Neither, then, in the consideration of the general phenomena, nor in the minute details were there any circumstances which suggested river action; on the contrary, they militated against it, and suggested subaërial action. But this being so, the very basis of Sir Charles Lyell's computation of enormous time was cut away. It was made to depend upon the slow action of the river cutting through an enormous chalk plateau, and carrying down to the sea millions of tons of chalk and other material, and all this before a peat formation commenced, which took 33,000 years. It was not his object to argue how long those beds might have been in formation under subaërial action, or how short a time was sufficient; the many accidents arising from the combination of the varied circumstances already detailed, rendered all argument as to measure of time very uncertain; but what his object had been was to show that the computation put forth by Sir Charles Lyell, and followed by so many others, was based upon utterly false premises.

Mr. Parker, before concluding, drew attention to a large collection of flint implements derived from the St. Acheul beds, chiefly from his own cabinet, but supplemented by others, by St. Sharp, Esq., F.G.S. Also implements from other places, and from bone caves, turbaries, British burial-mounds, &c., &c., for the sake of comparison.

He pointed out that if rudeness was a criterion of immense antiquity, several of those from the British graves at Brighthampton, near Oxford, found with characteristic British pottery, must be put long anterior in date to the St. Acheul implements, which were of a more developed type; in fact, the very perfection of the St. Acheul implements, while it told, on the one hand, with overwhelming force in favour of their being the work of man, at the same time militated against the enormous antiquity ascribed to them, unless we imagined man to have been wholly stationary, if not even retrogressive in the art of fabrication of his necessary implements of domestic and aggressive life.

The President (Professor Rolleston) said that as every part of the world was now shown to have had a flint period, it bore on the interesting anthropological question whether man rose from a savage state, or whether the present savage was a degradation from a higher state.

## PRIMITIVE MAN AND REVELATION.\*

BY PRINCIPAL J. W. DAWSON, LL.D., F.R.S., M'GILL COLLEGE, MONTREAL.  
HON. FOR. CORRESPONDENT OF THE VICTORIA INSTITUTE.

The battle-ground of opposition in the name of Science and Philosophy to the Holy Scriptures is ever changing, but in modern times most of it, in so far as Science is concerned, has centred on the early history of the earth and man as contained in Genesis. One portion of the controversy may be held to be disposed of. The geological record is so manifestly in accordance with the Mosaic history of creation that to all those (unfortunately as yet too few) who have an adequate knowledge of both stories, the anticipation of our modern knowledge of Astronomy, Physics, and Geology in the early chapters of Genesis is so marked as to constitute a positive proof of inspiration. Recent discoveries and hypotheses have given another turn to the discussion, and have directed it to questions relating to primitive man and the connection of the modern period with previous geological eras. Man, we are told, is a descendant of inferior animals. His primitive condition was one of half brutal barbarism. His rise to the actual position of humanity was through countless ages of progressive development, extending over periods vastly longer than those of Sacred history. These doctrines, supported by much plausible show of proof, are given forth by popular writers as ascertained results of scientific research, and we are asked to accept a new Genesis, shorn of all the higher spiritual features of that with which we are familiar, holding forth no idea of individual life and salvation, but only a dim prospect of some elevation of the race as the result of an indefinite struggle for existence in the future.

Many good men are naturally anxious as to whereto this may grow, and whether we are not on the brink of a decided breach between the Word of God and the study of the earliest human remains. My own belief is that the doctrines of the antiquity and descent of man, as held by the more extreme evolutionists, have attained to their maximum degree of importance, and that henceforth the more advanced speculators must retrace their steps toward the old beliefs, leaving, however, some most valuable facts in explanation of the early history of man. The subject is too extensive to allow of a full exposition of my reasons for this belief in the time to which this address must be limited, but I may refer to a few of the most recent facts in proof of my statement.

The physical characters of the known specimens of primitive men are unfavourable to the doctrine of evolution. Theories of derivation would lead us to regard the most degraded races of men as those nearest akin to the primitive stock; and the oldest remains of man should present decided approximation to his simian ancestors. But the fact is quite otherwise. With the exception of the celebrated Neanderthal skull, which stands alone, and is of altogether unascertained date, the skulls of the most ancient European men known to us, are comparable with those of existing races, and further,

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\* The value of Dr. Dawson's paper will be apparent to all who have watched the controversy, of which the Flint Implement discussion is one phase; it was read at the New York Conference last year, and he has now kindly placed a revised and corrected copy in my hands.—[Ed.]

the great stature and grand development of the limbs in those of the most ancient skeletons which are entire or nearly so, testify to a race of men more finely constituted physically than the majority of existing Europeans. The skull found by Schmerling in the Cave of Engis, associated with the bones of the mammoth and other extinct animals, is of good form and large capacity, and presents characters which, though recalling those of some European races, also resemble those of the native races of America. The bones described by Christy and Lartet from the Cave of Cro-Magnon, in France, represent a race of great stature, strength, and agility, and with a development of brain above the European average; but the lines of the face show a tendency to the Mongolian and American visage, and the skeletons present peculiarities in the bones of the limbs found also in American races, and indicating, probably, addiction to hunting and a migratory and active life. These Cro-Magnon people lived at an epoch when France was overgrown with dense forests, when the mammoth probably lingered in its higher districts, and when a large part of the food of its people was furnished by the reindeer. Still more remarkable, perhaps, is the fossil man, as he has been called, of Mentone, recently found in a cave in the South of France, buried under cavern accumulations which bespeak a great antiquity, and associated with bones of extinct mammalia and with rudely-fashioned implements of flint. It appears from the careful descriptions of Dr. Riviere that this man must have been six feet high and of vast muscular power, more especially in the legs, which present the same American peculiarities already referred to in the Cro-Magnon skeletons. The skull is of great capacity, the forehead full, and the face, though broad and Mongolian and large-boned, is not prognathous, and has a high facial angle. The perfect condition of the teeth, along with their being worn perfectly flat on the crowns, would imply a healthy and vigorous constitution and great longevity, with ample supplies of food, probably vegetable, while the fact that the left arm had been broken and the bone healed shows active and possibly warlike habits. Such a man, if he were to rise up again among us, might perhaps be a savage, but a noble savage, with all our capacity for culture, and presenting no more affinity to apes than we do.

If the question be asked, What precise relation do these primitive European men bear to anything in sacred history? we can only say that they all seem to indicate one race, and this allied to the old Turanian stock of Northern Asia, which has its outlying branches to this day both in America and Europe. If they are antediluvians, they show that the old Nephelim and Gibborim of the times before the flood were men of great physical as well as mental power, but not markedly distinct from modern races of men. If they are postdiluvians, then they reveal the qualities of the old Rephaim and Anakim of Palestine, who not improbably were of Turanian stock. In any case, they may well have points of historical contact with the Bible, if we were better informed as to their date and distribution.

I have referred to European facts only, but it is remarkable that in America the oldest race known to us is that of the ancient Alleghans and Toltecan and their allies, and that these, too, were men of large stature and great cranial development, and agricultural and semi-civilized, their actual position being not dissimilar from that attributed to the earliest cultivators of the soil in the times of Adam or Noah.

So far the facts bearing on the physical and mental condition of primitive man are not favourable to evolution, and are more in accordance with the theory of Divine Creation, and with the statements of the sacred record.

Recent facts with reference to primitive man show that his religious beliefs were similar to those referred to in Scripture. The whole of the long isolated tribes of America held to a primitive monotheism or belief in a Great Spirit, who was not only the creator and ruler of the heaven and the earth, but had

the control of countless inferior spirits—manitous or ministering angels. They also believed in an immortality and a judgment of all men beyond the grave. Hence arose in various forms the doctrine of guardian manitous, represented by tokens or teraphim, and watching over individuals, families, and places. Hence arose also the practice of burying with the dead the things he had valued in life, as likely, in the vague imaginings of the untaught mind, to be useful in the other world. Their traditions also embraced in various and crude forms the idea of a mediator or intercessor between God and man. No one who studies these beliefs of the American tribes can fail to recognize in them the remnants of the same primitive theology which we have in the patriarchal age of the Bible, and more or less in the religions of all ancient peoples of whom we have historical records. I may say here in passing that the tenacity with which the red man of America has clung in his barbarism and long isolation, to remnants of primitive truth, is an additional reason why we should strive to give him a purer gospel.

With reference to those prehistoric men, known to us only by their bones and implements, it may not be possible to discover their belief as to the unity of God; but we have distinct evidence on the other points. On the oldest bone implements—some of them made of the ivory of the now extinct mammoth—we find engraved the totems or manitou-marks of their owners, and in some cases scratches or punctures, indicating the offerings made or successes and deliverances experienced under their auspices. With regard to the belief in immortality, perhaps also in a resurrection, the Mentone man—whose burial is perhaps the oldest known to us—was interred with his fur robes and his hair dressed as in life, with his ornaments of shell wampum on his head and limbs, and with a little deposit of oxide of iron, wherewith to paint and decorate himself with his appropriate emblems. Nor is he alone in this matter. Similar provision for the dead appears at Cro-Magnon and the Cave of Bruniquel. Thus the earliest so-called Palæolithic men entertained beliefs in God and in immortality, perhaps the dim remains of primitive theism, perhaps the result of their perception of the invisible things of God in the works that He had made.

The antiquity of man as revealed by his prehistoric remains has probably been greatly exaggerated. A careful study of the latest edition of *The Antiquity of Man*, by Sir C. Lyell, in which that great geologist has summed up all the scattered evidence on this point, must leave this impression. The particular facts adduced are individually doubtful and susceptible of different interpretations, though collectively they present an imposing appearance, and many of them have been weakened by recent observations and discoveries. American analogies teach us, as I propose to show in papers soon to be published, that undue importance has been attached to the distinctions of Neolithic and Palæolithic ages. The physical changes which have taken place since the advent of man have been measured by standards inapplicable to them, and the extinct quadrupeds of the later post-Pliocene period may have lived nearer to our time than has been supposed. No human remains have been found in beds older than the close of the so-called Glacial period, and the earlier indications succeeding this period are not actual bones of men, but only rude implements, some of which are possibly, naturally-shaped stones, and others have had their antiquity exaggerated by misapprehension as to the mode of their occurrence.

It is, however, probable that the investigations now in progress will establish the fact that, in the earlier part of man's residence in the Old Continent, he was contemporary with many great quadrupeds now extinct, and that some of them, as well as some races of men, may have perished in a great continental subsidence which occurred early in the modern or human period. Both of these conclusions will, I think, bring themselves finally into harmony with the Biblical account of the antediluvian world, notwithstanding

the strenuous opposition of the large party opposed to any correlation of natural and spiritual truth.

Science may soon enable us to account for the divergence of mankind into permanent races in a way more satisfactory than heretofore. It has heretofore been a stumbling-block with many in the doctrine of the unity of man, that we find evidence of distinctness of race as great as at present in early Egyptian monuments. Modern ideas of derivation have swept away this as an infidel objection, but they have not failed to demand an enormous lapse of time for the early development of these races. A new law is, however, coming into view, which may render this unnecessary. It is that species, when first introduced, have an innate power of expansion, which enables them rapidly to extend themselves to the limits of their geographical range, and also to reach the limits of their divergence into races. These limits once reached, the races run on in parallel lines until they one by one run out and disappear. According to this law, the most aberrant races of men might be developed in a few centuries, after which divergence would cease, and the several lines of variation would remain permanent, at least so long as the conditions under which they originated remained. This new law, which was hinted at long ago by Hall, the Paleontologist of New York, is coming more distinctly into view, and will probably altogether remove one of the imagined necessities of a great antiquity of man. It may prove also to be applicable to language as well as to physical characters.

I have given above only a few examples out of many which may be adduced that the results of natural science as applied to man, however they may at first seem to conflict with the truth of God, will ultimately come into harmony with it.

One object in referring to these subjects here has been to invite the attention of Christians to certain errors in the treatment of such subjects, which I observe to be prevalent, and which I think every Christian man of science must sincerely deprecate.

The first is the hasty reception of broad popular statements of leading scientists as if they were received and proved conclusions. Nearly every new scientific fact and principle is at first only imperfectly understood and partially misapplied, and statements much too unguarded are often made by enthusiastic votaries of particular specialities.

The second is the resting content with the shallow assertion that the Bible need not be in harmony with Nature. The Bible is not a text-book of Science, nor are spiritual truths always directly reconcilable at first with natural truths. But the Bible, as a Book of God, cannot outrage Nature, and there are necessary harmonies between the natural and the spiritual. Weak admissions that the Bible accommodates itself to errors as to Nature may save the theologian the trouble of inquiry, and may be welcomed by men of science as setting them free from dogmatic trammels; but the earnest votary of science who is not a Christian despises those who make them, and regards their doctrine as worthless.

A third is the connection of ancient superstitions or modern ecclesiastical expediencies with God's Word. Science is in its nature hostile to superstition, and to hypocritical expediency \* \* \* \*

I believe that much of the antagonism of men of science is really excited by accessions which are not of God, but the growth of human device in darker ages of the world. I would not ask the Christian to accommodate his creed to any requirements of the science or literature of our day. That would be an equally fatal error. What I ask is that the scriptural truth may be presented unmixed with extraneous matters, not of the Bible, but of man.

Lastly, the Christian must not despise as unworthy of attention the current scientific doctrines on such subjects. If the missionary thinks it necessary to study the beliefs of the rudest tribes, that he may better teach

them the truth, surely we must not ignore the latest results of the intellectual work of the most cultivated men, which in any case is sure to influence the mind of the time, and which, properly treated, must yield positive results for the cause of God.

The scientific infidel is not always a wrong-doer to be put down. He is often a very darkened soul, struggling for light, and sometimes driven back from it by the follies and inconsistencies of Christians. The lamentable and growing separation between those who study God's works and those who believe in His word is not all of it the fault of the scientist. The theologian will be held responsible for so much of it as may result from his adulterating the water of life with unwholesome earthly elements.

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ANNUAL GENERAL MEETING,  
HELD AT THE HOUSE OF THE SOCIETY OF ARTS,\*  
MAY 20, 1873.

THE REV. WALTER MITCHELL, M.A., VICE-PRESIDENT,  
IN THE CHAIR.

The HONORARY SECRETARY, Capt. F. PETRIE, read the following Report :—

*SEVENTH ANNUAL REPORT of the Council of the  
VICTORIA INSTITUTE, OR PHILOSOPHICAL SOCIETY OF  
GREAT BRITAIN.*

*Progress of the Institute.*

1. IN presenting the Seventh Annual Report, the Council desires to congratulate the Members and Associates on the continued improvement in the Society's position; mainly due, first, to the firm and continued support of the members and associates; secondly, to a considerable accession of new Members, among whom are several Professors of Oxford, Cambridge, and other Universities; and also many well known in the literary and scientific world. Last year it was stated that "a full review of the requirements of the Institute, and of the duties it is called upon to fulfil, has satisfied the Council that not until the number of Members and Associates shall have been raised to five hundred (of which not more than one hundred should be Associates) can the Society's present sphere of action be extended and its objects fully realized;" and considering its present position, it is believed that if the members and associates will kindly co-operate with the President and Council in increasing the strength of the Institute, this necessary number will speedily be attained.

2. Three vacancies in the Council have been filled up by the election of John Eliot Howard, Esq., F.L.S., Iltudus T. Prichard, Esq., F.S.S., and the Rev. G. W. Weldon, M.A., B.M., F.L.S.

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\* The Meeting was fully attended. Letters expressing regret at being unable to be present, were read from the following members :—The Archbishop of Canterbury, the Duke of Marlborough, the Bishop of London, the Earl of Dartmouth, the Bishop Suffragan of Nottingham, the Right Hon. S. Cave, M.P., the Hon. W. Ashley, Archdeacon Bickersteth, and others.

3. The appointment of a paid Secretary is still deferred until such an expense can be incurred without detriment to the interests of the Institute.

4. With a view to the convenience of Members, the Reading and Writing-room, and the Library, have been thrown open from ten till six o'clock. Although, of late, many valuable additions have been made to the Library, and several learned institutions, including the Royal Society, have enriched it by exchanging Proceedings with the Institute, yet it is by no means so extensive as desirable, and gifts of books, as well as further subscriptions to the Special Fund, are invited.

5. The Council regrets to announce the decease of the following valued supporters of the Institute:—The Rev. J. N. Green Armytage, M.A. (Foundation Member); A. C. Brebner, Esq. (Associate); the Right Hon. the Lord Harris, G.C.S.I. (Member); Sir Donald McLeod, K.C.S.I. (Member); the Rev. W. Shaw, M.A. (Foundation Member); Major H. D. Broughton Smith (Life Member); Neil Smith, Esq., Jun., A.M. (Member); Rev. W. Webster, M.A. (Foundation Associate).

6. The following is a statement of the changes which have occurred during the past twelve months:—

	Life		Annual	
	Members.	Associates.	Members.	Associates.
Numbers on 1st May, 1872.....	28	5	209	82
Deduct deaths ...	1	—	5	2
	—	—	—	—
	27	—	204	80
Withdrawn .....	—	—	5	5
	—	—	—	—
	—	—	199	75
Changes .....	—	—	- 1	+ 1
	—	—	—	—
	—	—	198	76
Joined between May 1st, 1872, and May 1st, 1873 .....	—	2	47	62
	—	—	—	—
	27	7	245	138
	34		383	
Total.....			417*	

\* The total number on the 1st of January, 1871, was 204.

*Finance.*

7. The Audited Balance Sheet of the Treasurer for the year ending 31st December, 1872, is appended, showing a balance in hand of £116. 0s. 6d., after the payment of every debt up to the last day of the year.\* It will be observed that the Balance Sheet has been divided into two portions, one headed "General Account," exhibiting a balance in hand of £83. 19s. 3d., a sum which enables the Council to defray the cost of the last part of the *Transactions* for the year, and the completion of the volume, the expenses of which have hitherto been paid out of the succeeding year's subscriptions; the other entitled the "Special Fund for Library," &c., showing a balance in hand of £32. 11s. 3d. The total amount now invested in the New Three per Cent. Annuities is £484. 9s. 2d.

8. The arrears of subscription are now as follows :—

	1869.	1870.	1872.
Members.....	2	2	6
Associates ..	—	—	2
	—	—	—
	2	2	8

9. The estimated ordinary assets of the Institute for the current year, exclusive of arrears and of new subscribers, are as follows :—

245 Members, at £2. 2s. ....	£514 10
138 Associates, at £1. 1s. ....	144 18
Annual Subscribers.	
Vice-Patrons, Life Members, and Life Associates.	
(Dividend on £484. 9s. 2d. Three per Cent. Stock) .....	14 5
Total.....	£673 13

*Meetings.*

10. The following is a list of the papers for the present session, viz. :—

On "Force and Energy." By CHARLES BROOKE, Esq., F.R.S., V.P.  
(December 2, 1872).

\* As was the case last year, this was owing to the Institute's funds having been relieved from the payment of a Secretary's salary since the 31st January, 1871, the increase of Members, and a system of rigid economy.

- “On Darwinism and its Effects upon Religious Thought.” By C. R. BREE, Esq., M.D., F.Z.S., &c. (January 6, 1873).
- “Remarks on some of the Current Principles of Historical Criticism.” By Rev. C. A. ROW, M.A. (February 3).
- “On Scientific Facts.” By J. E. HOWARD, Esq., F.L.S. (February 17).
- “The Law of Creation—Unity of Plan, Variety of Form.” By Rev. G. W. WELDON, M.A. (March 3).
- “On Force.” By Professor Kirk (April 7).
- “On the so-called Flint Implements of the Drift.” By W. D. MICHELL, Esq. Mr. Whitley’s and other valuable Collections of Specimens were exhibited on the occasion, May 6. (Held at the HOUSE of the SOCIETY OF ARTS.)
- Annual Address, by the Rev. T. P. BOULTBEE, M.A., LL.D., May 20. (Held at the HOUSE of the SOCIETY OF ARTS.)
- “On Prehistoric Traditions and Customs in connection with Sun and Serpent-Worship.” By J. S. PHENÉ, Esq., F.L.S., &c. (June 16).

11. Although the regular “ordinary” meetings during the present session have been only monthly, yet others have taken place, at which—in accordance with the fifth object of the Institute—subjects not necessarily requiring permanent record in the *Journal of Transactions*, were taken up in Papers or Lectures, followed by discussions. The advantage in reducing the number of “ordinary” meetings is that the issue of the printed Transactions will be more prompt than heretofore.

12. The meetings during this session have been well attended; that of the 6th May was held at the large hall of the Society of Arts, the rooms of the Institute not affording adequate accommodation.

#### *Publications.*

13. The sixth volume of the *Journal of Transactions* was issued as early as possible this year, and included a List of the Members and Associates; a Catalogue of the Library, with the new rules; and also a list of those who had kindly contributed Works during the past year. In issuing the last part for 1872 these lists were, for greater convenience, bound up with it, instead of being published separately as heretofore. Part 25 of the *Journal of Transactions* has appeared; Part 26 is now in the press, and will be ready in June; Part 27 will be published in September, and Part 28 in December, completing the Seventh volume of our *Journal of Transactions*; and including nearly all of the Papers and Discussions of the present session.

14. The Rev. Walter Mitchell having, by reason of improved health, been enabled to send in his paper “On the

Isomorphism of Crystalline Bodies," Part 8 is now in the press, and its issue will complete Volume II.

15. At the beginning of 1872 the Council decided that it would be necessary to print a much larger number of copies of the *Transactions* than heretofore. That such a step was desirable is evidenced by the continued increase in the demand for the publications of the Institute. The results of the sales have doubled in each succeeding year since 1870.

*Conclusion.*

16. In conclusion, the Council desires to state that the VICTORIA INSTITUTE was originally devised upon a large scale, and it is evident that it ought to be no small Society, considering the interests at stake, and the important objects which it seeks to accomplish. That such an Institute was needed is becoming generally acknowledged, and that it can do good service has been fully proved.

Signed on behalf of the Council,

SHAFTESBURY, *President.*

The HONORARY TREASURER, W. N. WEST, Esq., then read the following Balance-Sheet :—

# SEVENTH ANNUAL BALANCE SHEET, from 1st January to 31st December, 1872.

## GENERAL ACCOUNT.

RECEIPTS.	£.	s.	d.		£.	s.	d.
Balance from 1871, brought forward ...	...	...	...	15	12	1	
Subscriptions:—							
3 Life Members ...	63	0	0				
1 Member for 1869 ...	2	2	0				
2     "     1870 ...	4	4	0				
11   "     1871 ...	23	2	0				
197   "     1872 ...	413	14	0				
6     "     1873 ...	12	12	0				
48 Entrance fees ...	50	8	0				
2 Life Associates ...	21	0	0				
7     "     1871 ...	7	7	0				
100   "     1872 ...	105	0	0				
7     "     1873 ...	7	7	0				
1     "     1874 ...	1	1	0				
				710	17	0	
Six months' Dividend on £359 2 2 } new 3 per Cent.				12	7	11	
"     "     484 9 2 } Annuities ...				28	19	11	
Sale of Journals ...				13	13	0	
From Meteorological Society for use of rooms ...							
				£781	9	11	

EXPENDITURE.	£.	s.	d.		£.	s.	d.
Printing ...	278	12	6				
Binding ...	7	14	4				
Reporting ...	25	4	0				
Stationery ...	26	15	7				
Postage ...	45	11	2				
Advertising ...	36	17	0				
Refreshments at and Expenses of the Meetings ...	12	5	6				
Rent to Michaelmas, 1872 ...	60	0	0				
Salaries (for the year 1872) ...	32	1	0				
Housekeeper ...	21	13	3				
Travelling Expenses ...	9	18	0				
Coals ...	4	16	0				
Gas ...	3	2	9				
Insurance ...	0	6	0				
Sundry Office Expenses ...	15	16	9				
Bankers' Charges ...	0	2	4				
Investments—£125. 7s. new 3 per Cent. Annuities... 116 14 6	116	14	6				
Balance at the Bankers ...	83	19	3†				
	£781	9	11				

## SPECIAL FUND FOR LIBRARY, &c.

RECEIPTS.	£.	s.	d.		£.	s.	d.
Balance brought forward from 1871 ...	3	16	4				
A. McArthur, Esq. ...	42	0	0				
Per Admiral Halsted, R.N. (the late) ...	2	2	0				
	£47	18	4				

Books, Repairs, &c. ...	15	17	1		32	1	3†
Balance at the Bankers ...					£47	18	4

“We have examined the Balance Sheet with the Books and Vouchers, and find a Balance in hand of £116. 10s. 6d.”† (See Section 7.)

{ W. VANNER, }  
 { G. C. HARRISON, } *Auditors*  
 W. N. WEST, *Treasurer.*

## DONATIONS TO THE SPECIAL FUND.

*Paid prior to 31st December, 1869.*

	£.	s.	d.
S. MORLEY, Esq., M.P.....	100	0	0
I. BRAITHWAITE, Esq. ....	25	0	0
R. MULLINGS, Esq. ....	10	0	0
Dr. J. H. WHEATLEY.....	10	0	0
H. W. BLEBY, Esq., B.A.....	5	0	0
T. PROTHERO, Esq. ....	3	3	0
A. J. WOODHOUSE, Esq. ....	3	3	0
W. N. WEST, Esq.....	2	2	0
G. WILLIAMS, Esq. ....	1	1	0
Rev. J. H. RIGG, D.D. ....	1	1	0
	<u>£160</u>	<u>10</u>	<u>0</u>

*Paid during 1870.*

	£.	s.	d.
ROBERT BAXTER, Esq. ....	52	10	0
W. McARTHUR, Esq., M.P. ....	21	0	0
JOHN NAPIER, Esq., <i>Glasgow</i> .....	10	0	0
W. VANNER, Esq. ....	10	0	0
Vice-Admiral HALSFED (the late).....	5	0	0
S. PETRIE, Esq., C.B. (the late) .....	5	0	0
Rev. J. H. A. WALSH, M.A. (the late) .....	5	0	0
Rev. W. NIVEN, B.D. ....	5	0	0
Rev. W. H. BATHURST, M.A. ....	2	2	0
Captain JASPER SELWYN, R.N. ....	3	0	0
Dr. FRASER.....	5	0	0
T. W. MASTERMAN, Esq. ....	5	5	0
W. H. INCE, Esq. ....	2	2	3
Rev. C. KEMBLE, M.A.....	5	0	0
A. V. NEWTON, Esq.....	3	0	0
Rev. J. B. OWEN, M.A. (the late).....	3	0	0
CHARLES BROOKE, Esq. ....	5	0	0
Rev. A. DE LA MARE, M.A. ....	3	3	0
JOHN SHIELDS, Esq., <i>Durham</i> .....	2	2	2
S. D. WADDY, Esq. ....	5	5	0
E. CHANCE, Esq., J.P., <i>Malvern</i> .....	2	2	0
Very Rev. Dean PAYNE SMITH, D.D.....	1	1	0

J. LEWIS, Esq., R.N.....	1	1	0
Rev. C. A. ROW, M.A. ....	1	1	0
Rev. J. H. TITCOMB, M.A. ....	1	1	0
G. C. HARRISON, Esq. ....	1	0	0
Rev. C. SKRINE, M.A. ....	1	0	0
J. SHAW, Esq., M.D., <i>Boston</i> .....	1	0	0
W. PAYNE, Esq. ....	1	0	0
Rev. R. THORNTON .....	3	3	0
Rev. G. R. BADENOCH .....	1	1	0

£171 19 0

1872.

	£.	s.	d.
A. MCARTHUR, Esq. ....	42	0	0
Per Admiral HALSTED, R.N. ....	2	2	0

Total ..... £376 11 0

Rev. W. J. IRONS, D.D.—I beg to move the first resolution: "That the Report which has been read be printed and circulated among the members;" and, in doing so, must express my gratification at the steady progress the Institute is making, and that it is now, under God's guidance, doing great service for that cause which is dearer to all of us than life itself. When this Institute was founded, we all knew that there had been a growing feeling of anxiety among Christians lest the rising generation should be tainted with that materialistic philosophy which seemed to have no proper antagonist on our side. At the present time we may congratulate ourselves that our intense anxiety on that point has decreased. The men of science who are unfriendly to Christianity, are quite aware by this time that there is no position which they can distinctly and honestly put forward which we are not entirely prepared frankly to meet. (Cheers.) Some of the positions which they were bold enough to venture have been so met, that it is not likely that they will be thoughtlessly paraded in future. Many of the great theories or hypotheses of unbelief are wholly insoluble by argument; but we only deal here with argument. If any man have an objection to adduce, let him bring it forward with a clear mind and a clear voice and set it amongst us; we will frankly meet it, and then—may God defend the right; (Cheers.) I think that every one who is acquainted with this Society—and that means many thousands—knows well that we shrink from no purely scientific issue that can possibly be raised; and it is a great thing for us that we have an Institute such as this in our metropolis which can challenge a reasonable hearing on behalf of Christianity. I am sorry, Sir, that we

have not circulated our Transactions much more extensively.\* You must not suppose that any of us agree with all the statements in the papers. Some of them I have read with considerable hesitation, but all of them with admiration—admiration at your courage, at your fairness, and at your thorough determination that questions shall be honestly probed. That will tell among Englishmen. I heartily wish we could make some men blush when they have been convicted of bad reasoning and have not had the grace to own it. I think, sir, your own memory, and that of the members of the council, will fully understand my allusion.

Lieut.-Gen. CRAWFORD.—On coming into this room, I had the honour of having a suggestion made to me that I should second this resolution. I suppose a soldier will always be ready and willing to do anything he can for the honour and glory of his master—that great Eternal Master who gave us that blessed Book which is to be our guide in life and our comfort in death, and the fruits of which will be a glorious immortality hereafter. Surely, as soldiers, we are all bound to stand by that Book, and to meet and oppose its enemies—not with carnal weapons, but with the weapons of a scientific intellectual opposition, such as have been ever used by this Society. (Cheers.) The other day, I think it was on the 6th of this month, we had a paper read and an important discussion upon the so-called—I am glad we have that phrase “so-called”—flint implements of the Drift. Now the fact of the matter is, that whatever may be said of it, there never was a period in the world’s history in which men were so led by authority as they are now. They enthrone the intellects of some men who manage to get the ear of the public; they enthrone certain men who manage to flutter their vanity and influence their belief, by the view that free-thinkers are exercising their faculties without being chained as slaves to the opinions of others. But the fact is the very reverse in the present day, if you take the thousands who imbibe these pernicious views, questions and doubts, with regard to the Bible. It is entirely by the assertions of others—the dogmatic, continuous assertion of that which has never been proved to be a fact scientifically—that most people are led. I recollect sitting once by the bedside of that venerable man, Sir David Brewster, shortly before his death. He said: “General, in the present day people fancy that they are free-thinkers, and that they are searching, with a thoroughly intellectual examination, into every subject that comes before them with reference to those questions which bear on the veracity of the Bible. But, in the whole history of the world, I don’t think there ever was a period of time when men were more led by the opinions of others.” He also made this further observation: “I remember, in my early days, when I was a young man, a sceptic showed me some books belonging to the school

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\* With a view to the more extensive circulation of the Transactions, it has been decided, so far as the funds of the Institute admit, to issue a selection of the most popular papers in a “People’s Edition;” the first paper of this series to be the Annual Address delivered on this occasion.—[Ed.]

of Voltaire and his followers, and he said 'they were most admirable books, —that they were so conclusively written, and in such a philosophical spirit, that scepticism, which for many generations had been afraid and ashamed to raise its head, had at last been able to do so.' Now, young men in the present day have really and truly never read these works which are said to be so conclusive for the overthrowing of our faith ; but I have read them ; and if other people would do the same, the result would be that they would be ashamed of being implicated in the advancement of views which are so utterly untenable by intelligent and philosophic minds." He also said : " I have desired to keep myself well abreast of the intellect of the times, and I think I may say that, after my long life, I know pretty well where Science has spoken and where she has been silent, and, in my judgment, a vast quantity of the theories of the day are based upon nothing but assertion." He added : " I am not aware of one single scientific proven fact connected with geology, or any other scientific fact, which in the slightest degree affects the truth of the Bible. I do not mean assertions. I mean real, well-grounded scientific fact founded upon pure and perfect induction—the premisses clear and distinct, and the inferences irresistible." Such were Sir David's words, as near as I can give them. Now, I would say in reference to the paper which we had on the flint implements of the Drift, and to the discussion which took place upon it, that what we want now is a true, established, certain, unequivocal scale for measuring time, and we have never had one yet. We have never had a scale which has been proved to be true for measuring past times in geology. As to these flint flakes, I recollect years ago seeing some of them for the first time ; but the moment I saw their irregular form and their great number—and they had all come from one locality,—and the impracticability of their nature, I said to myself, " Can any rational man believe that these are anything like humanly-constructed implements ? Here are an immense number of them. How came they together in this place ? The place could not have been a workshop, or a place in which arms were made. How, then, can people found a theory on anything of the kind ?" So, again, when I heard the paper read here the other day, I was satisfied that these flakes were merely the results of some natural convulsion, in which they were broken up in the way that we see them, and that they never were real implements at all. I only touch upon this matter in order to show how important it is that the subject should be examined, and that we should get some proper scale to measure past time by. They tell us that so many thousands of years were necessary for the production of a certain thing ; but where is the warrant for such a statement ? The object of this Society is to investigate these matters without passion and without preconceived views ; to deal with them with clear minds, and to face the truth wherever it is ; and I know that our Chairman will follow out this plan, even if no one else will. (Cheers.) The Society wants support, and it should be supported, for it deserves it. It wants to have its works spread broadcast over the country, and they ought to be published at a cheaper rate than they are ; but we cannot do that until we enlarge our means.

We have for our object the glorious purpose of vindicating that Faith which has liberated nations ; which has liberated the human intellect ; and which has spread civilization over the world ; and it is our duty to see that that Book, the record of God's will, is held by us, and transmitted to our children, notwithstanding the hostility of those who have hitherto opposed it, and who, I trust, through our operations, and by God's grace softening their hearts and opening their eyes to untruth and to the marvels of God, will at last take this Book as God's great gift next to His Son, because it proclaims Him to be the Son of God. I have much pleasure in seconding the resolution.

The resolution was then put to the meeting, and unanimously agreed to.

Admiral E. P. HALSTED.—I am very happy to move the second resolution ; but as I am not so eloquent as my predecessors, I trust my friends and brethren of this Institute will accept from me simply the terms of the motion : “That the thanks of the members and associates be presented to the Council and the honorary officers for their efficient conduct of the business of the ‘Victoria Institute’ during the past year.” (Cheers.) I have great gratification in moving this resolution, because, from the accounts we have heard, though, perhaps, the Institute might have progressed faster, the rapid progress which it has made is due to the exertions of the council and the honorary officers. (Cheers.) The founder himself, my dear and good friend Mr. Reddie, would have been most gratified to-night if he could have heard the report read. I do not know that I can say anything more—I should be happy if I could ; but I am not useful in the way that others are. I am quite sure the resolution will be properly supported by those who are better able than myself to speak upon it. (Cheers.)

The Rev. G. CURREY, D.D.—I believe that most of those who have already spoken have been acquainted with the proceedings and working of this Institute longer than I have—having only recently had the pleasure of joining it and taking part in its discussions. I have only been present at a few of the meetings of the Institute ; but on such occasions have always acquired some information which I believe has been valuable to myself, and I think that all who attend the meetings of this Institute go away with the same impression. I am sure that nothing could tend more to the real knowledge of the great subjects which are continually put before us by this important Institute, than the quiet and simple discussion of various particular points, as they are raised at each of the meetings. In these meetings—which appear comparatively small when we look upon the large and crowded meeting brought together this evening—persons are able to rise and to speak their thoughts freely ; and I have always been pleased to observe how freely those thoughts are expressed, even though they may seem to run counter to the general opinions held here. I have admired the freedom with which people have been able to come forward and state their difficulties, and the mode in which they imagine they are able to solve them, while they are quite ready, at the same time, to hear other arguments and objections to their own mode of dealing with the ques-

tion. I think this method of proceeding is peculiarly valuable in the present day. It is valuable because it makes a person think for himself. If I have to stand up and say even a very few words upon such subjects as are brought before us at these meetings, I must bring my thought a little to these subjects in such a way as really to make some reflections upon them for myself, and this, I think, is one of the special advantages; for the great evil of the present day is, that all these subjects, which are of a most complicated character, and which involve the deepest interests and the most important questions, are thrown before us in the rapid circulation of periodicals, or in the free and unrestrained conversation of private life. They are taken up at one moment and laid down the next, with just a few words in passing upon them, and those words are not really words expressive of thought. Now thought is what we want. We do not want people to shut their eyes to all these difficulties that have been raised; we want them to think about them, and to think before they speak. In the present day, we get so accustomed to speaking, that a large number of people are able to speak without thinking, and that seems to me to be one of the evils that these quiet meetings of ours are peculiarly adapted to correct, because every one knows, that when he rises at such a meeting, however fluent or eloquent in expression he may be, what he says will be carefully examined; and if it contain nothing but mere sound, it will soon be discovered by those who, perhaps, are not able to speak so fluently, but who think and work more deeply. I say, then, that every time I have attended these meetings, I have gone away with some additional knowledge on some subjects of thought, which has been calculated to be useful to me afterwards. There is one kind of knowledge which we all obtain at these meetings, and that is, a knowledge of the difficulties and doubts entertained by other persons,—difficulties and doubts which, perhaps, we may never have heard of before. We may have heard of the particular subjects, or of the particular doubts, but not of the peculiar manner in which those doubts weigh upon the minds of some persons. It is at such meetings as these that people rise and explain their doubts. It may, of course, be painful sometimes to hear and to know of the difficulties and complications which arise to perplex some minds which are just beginning to awaken to light; but we must all be aware of this—that light in general, when it is first poured upon us, is at first sight painful to the eye, and the consequence is that many people never get further than closing the eyes in order to avoid it. It is just that which such a society as this is especially intended to correct. We must be ready to welcome all light if it be true light, and we must examine it. At first we may be blinded and astonished by much of it; but let us look calmly and quietly upon it, and we shall find the blessedness of that light, and that, so far from preventing us from seeing the truth, it will really aid us in discerning it. Our great object is to welcome all new light, from whatever source it comes, if it be pure and true light. If it be false light, we must examine and discover it; not by closing our eyes or putting a screen before it, but by introducing the pure, true, and brilliant light which shines so magnificently, and which will

soon put to shame any false and spurious luminary. Now this view of the subject, which seems to me appropriate to the great purposes of this Institute, is, I think, peculiarly consonant with the resolution which I have the honour to second—namely, that our thanks be given to the Council and to the honorary officers,—because all the preparations for our discussions, and the obtaining eminent persons to come forward and read papers, like other things in this world, cannot be done without considerable difficulty and effort, and I am quite sure that we have a great deal to thank the Council and the honorary officers for, when we remember the success they have achieved in putting before our meetings subjects worthy of discussion, and in obtaining eminent persons to read papers of so instructive and valuable a character. I have therefore great pleasure in seconding the resolution, which has been placed in my hands. (Cheers.)

The resolution was unanimously agreed to.

Mr. A. M'ARTHUR.—On behalf of the Council I can assure those who are present that we duly appreciate this expression of their approbation and confidence. We are all conscious of many shortcomings and defects, but I may say that we have honestly and faithfully endeavoured, as far as was possible, to discharge the duties that have devolved upon us during the past year. (Cheers.) Most of the members of the Council are men whose time is valuable, and whose engagements are very numerous; but I think we all feel that the "Victoria Institute" is a necessary, an important, and, I am glad to say, a successful Institution. (Cheers.) We therefore feel it to be alike a pleasure, a privilege, and a duty, to do anything in our power to promote its interests and extend its usefulness. I think we have had evidence in the speeches delivered this evening, that such institutions as this are necessary in the present day. (Cheers.) The friends and supporters of infidel views are active and energetic, and though we are glad to find Dr. Irons taking so favourable a view as he does of the present state of affairs, still most of us believe that there never was a period in the history of this country when the contest between light and darkness, and between truth and error, was carried on with greater zeal, energy, ability, and determination than is the case now. And although we are perfectly satisfied that "truth is mighty, and must prevail," yet we are also convinced that very much depends upon the manner in which we conscientiously discharge the duties devolving upon us, and I think we have reason to be thankful for the success that has hitherto attended our labours. I think it is a cause for gratitude and thankfulness that our members have increased, and that we have been able to accomplish so much good. I have no hesitation in saying that any man who makes himself acquainted with the Transactions of this Institute from its commencement until now, will have a fund of useful information, which he would find it difficult to obtain in the same space anywhere else, and which will prepare him for defending the truth, and enable him to defend it successfully against the cavils and infidelity of sceptics. I trust that I may be allowed to say I think this Institute is eminently worthy of support. There are other associations, valuable in themselves, and

working in the same cause, where the purely theological aspect of the question is taken up; but in this Institute, as has been stated, we take, also, the scientific view of the question. I need scarcely say that we regard ourselves as the true friends of science; that we rejoice in every step in advance which true science makes, and that we are quite satisfied that no scientific discovery will be in opposition to the truth of the Divine word. It has already been said that our object is to investigate scientific facts. We are glad to receive scientific facts, but what we regard as our chief object, and as the main part of our usefulness, is to investigate scientific theories which are not facts, and to disprove them. We are old enough to recollect how many scientific theories have been trumpeted forth as contravening the truths of Christianity, but when they have been investigated they have been found to be altogether untenable, and their authors have been ultimately compelled to give them up as unscientific. What we want, therefore, is that these scientific theories should be brought to the test of truth, and when they are found to be facts we shall rejoice in accepting them, and we have no fear whatever that they will contravene the truth of Scripture. I will only say, before I sit down, that for our success we are largely indebted to the unwearied exertions of our Honorary Secretary, Captain F. Petrie (cheers), who came to our assistance at a time when we very much required his help. He has thrown his whole heart and soul into the work, and he has rendered us invaluable service. (Cheers.) It would be unjust if I were not to make this statement, that we are mainly indebted for our success to the exertions of Captain Petrie. (Cheers.)

Mr. W. N. WEST.—On behalf of the honorary officers, I have to thank you for the way in which we have been mentioned. For my own part I can only say that I have done very little, having had very little to do; but I join heartily with Mr. M'Arthur in the statement that it is to the zeal and untiring energy of the Honorary Secretary that we owe the present position of this Institute. (Cheers.)

The Right Rev. BISHOP CLAUGHTON.—The third resolution which has been placed in my hands will, I have no doubt, be gladly assented to by those who are present. It is—"That the following be the Council and Officers for the ensuing year:—

#### COUNCIL AND OFFICERS FOR 1873-4.

*President.*—The Right Honourable the EARL OF SHAFTESBURY, K.G.

*Vice-Presidents.*

PHILIP HENRY GOSSE, Esq., F.R.S.      Rev. WALTER MITCHELL, M.A.

C. B. RADCLIFFE, Esq., M.D., &c.      Rev. ROBINSON THORNTON, D.D.

CHARLES BROOKE, Esq., M.A., F.R.S., P.R.M.S., &c.

*Hon. Foreign Correspondent*—CONSTANTIN DE TISCHENDORF, LL.D., D.C.L., &c.

*Honorary Treasurer*—WILLIAM NOWELL WEST, Esq.

*Hon. Sec. and Editor of Journal*—Captain F. W. H. PETRIE, F.G.S., F.R.S.L., &c.

*Honorary Foreign Secretary*—EDWARD J. MORSHEAD, Esq., H.M.C.S.

## Council.

ROBERT BAXTER, Esq. (*Trustee*).  
 Rev. A. DE LA MARE, M.A.  
 Rear-Admiral E. G. FISHBOURNE, C.B.  
 R. N. FOWLER, Esq., M.P. (*Trustee*).  
 WILLIAM H. INCE, Esq., F.L.S.,  
 F.R.M.S.  
 ALEX. M'ARTHUR, Esq.  
 ALFRED V. NEWTON, Esq., F.A.S.L.  
 WILLIAM M. ORD, Esq., M.D.  
 S. D. WADDY, Esq.  
 WILLIAM VANNER, Esq., F.R.M.S.  
 ALFRED J. WOODHOUSE, Esq., F.R.M.S.  
 Rev. J. H. RIGG, D.D.

Rev. C. A. ROW, M.A.  
 Rev. J. H. TITCOMB, M.A.  
 J. A. FRASER, Esq., M.D., I.G.H.  
 Rev. G. HENSLOW, M.A., F.L.S.  
 Rev CHARLES GRAHAM.  
 T. W. MASTERMAN, Esq.  
 H. CADMAN JONES, Esq., Barrister-at-Law.  
 Rev. J. G. WOOD, M.A., F.L.S.  
 Rev. W. ARTHUR, D.D.  
 C. R. BREE, Esq., M.D., F.Z.S., &c.  
 JOHN ELIOT HOWARD, Esq., F.L.S., &c.  
 Rev. G. W. WELDON, M.A., B.M., F.L.S.

I have been with Mr. Bradlaugh and his associates in their so-called Hall of Science, and have acquired a considerable insight into what are their difficulties and views, and into the fallacious arguments with which they solace themselves, and by which they fancy they can hide from themselves that broad and pure light of which Dr. Currey has so well spoken. Now what I have heard amongst you to-night has been to me most encouraging and gratifying; but we should remember, whilst we meet here as friends, all agreeing in receiving that clear light, and rejoicing in its beams, that there are others outside who enjoy nothing of the kind. There are those upon whom difficulty, darkness, and doubt press like a heavy weight, and we must not forget that we have done but a very small part of our work when we satisfy ourselves of the truth of our arguments. We have to state them to those who, first of all, are not amenable to our arguments at all—who do not even care to argue the point with us, who love to think they are right, and who do not try to raise the question at all. The difficulty is to reach these people. You cannot reach them by argument: your theories are sound and good, but of what use are they, unless you can by some powerful sympathy get close to these poor creatures whom you want to help? Now, do not think that I undervalue your labours. *We must have a workshop for forging the great guns with which we hope one day to batter down the fortresses of opponents*; but the opponents I now speak of are not those poor darkened fellow-creatures of ours who are misled, but those who are misleading them. With regard to science I quite sympathize with what has been said by previous speakers, that we are not in the least afraid of it. But in the case of those imperfect theories which are brought before us and used as arguments, before they are fit to be introduced into the realms of science and true argument,—these are the things which we have to deal with. In such a Society as this we are not afraid of any facts—bring us as many facts as you like, but do not bring us these theories. General Crawford spoke very properly of the difficulty of getting a scale to measure time with, so as to meet the arguments of false scientific reasoners. Now I am not a scientific person myself, but I have been much struck by one thing, which may interest those who understand these matters better than I do. There are two volcanic islands in the Atlantic—the island

of St. Helena and the island of Ascension—not a thousand miles apart, and they must both have been in existence for at least a thousand years since they were first thrown up by volcanic agency. Now that is a very long time and, so far as we know, no change whatever has taken place in them on the surface; and yet, in one there has been a continual and marked change going on under the surface year by year, altering and bringing things back again to their original elements, while the other is as if it had been thrown up only yesterday. In the island of Ascension, below the surface of the ground, you can turn up the lava quite fresh, as though it had been deposited only yesterday; but in the other island you can do nothing of the kind. There is some law which requires explanation, and which shows how impossible it is to argue that the lapse of a certain period of time must produce certain changes. I put this, not as an argument, but as an ignorant, unscientific, rude illustration. There is another which I should like to mention. The first time I returned home I came by sea, which enables us to learn the power and greatness of that Almighty Being whom we worship, and to know the meaning of faith and reliance on God. The last time I came by the overland route, part of the journey being performed in one of those fine steamers belonging to the P. and O. Company; and I, being a clergyman, held service on Sundays for my fellow voyagers; and every day I assembled those who were willing to come and take part in a few short prayers and a short reading of Scripture. Every day, as we came past those interesting places along the shores of the Red Sea, almost in sight of Sinai, we had a talk about them. I heard that there had been a great deal of careless, unscientific, talk among some young men on board, who, not thinking of what they were saying, used to amuse themselves by foolish things, said in conversation, about the belief in the historical accounts of the Scriptures. This was brought to my ears, though not in any unkind spirit; and I found that some had been expressing a disbelief in the Mosaic account of the Deluge. We came, at last, to the very scene where tradition says the Israelites passed over the Red Sea, and, on Sunday morning, we were all gathered together for our short service, including the young men of whom I have spoken, when I found that all their thoughts, like my own, had been dwelling on the events which were supposed to have happened at the spots by which we passed. Whether we came to Aden, or to Suez, we found that the natives, though not themselves Christians or Jews, all believed in the record of what had occurred in this part of the world,—the whole thing has a force, and power, and truth, when you are on the spot, which is irresistible; and I found that my young friends, who had talked lightly and foolishly among themselves, all became perfect believers in the account of the Bible as they passed through these interesting places. In the few words of sermon which I gave, I found, from the attention that was paid to it, that we had not passed through these scenes in vain. In all these ways, my dear friends, what we want is to throw ourselves with sympathy among people, who are sometimes misled, and sometimes misleading others,—all conscious, though they do not like to confess it, of the

want of those things which we want to convey to them. There is no difference, go where you will. It is the same with the dark, benighted African, and with the more enlightened and philosophic Eastern—in all, you want to touch the heart. Put away, for the present, the condition of his head—the heart of man is the same, and its wants the same everywhere; and if you can once bring home to it the truths of God, you will not require much labour, or time, or scientific knowledge, to convince the head of the truth of your arguments. Not that I wish to disparage your good and excellent work, but men are the same everywhere, and if you can once bring them to our great loving Father in Heaven, and to His Son, Jesus Christ, you will have no more unbelief. The course is a terribly difficult one; but remember that no man can insure even his own unbelief. No atheist can be positively secure in his own atheism; he has far more difficulty in maintaining his own position of doubt and denial, than you have in maintaining your position of belief and acceptance. Let us then cultivate the gifts of the widest sympathy, and the deepest humility, and remember to do all things for the honour and glory of God. (Cheers.)

Rev. Dr. BLACKWOOD.—The resolution which I have to second is of so very formal a character, and has been introduced so eloquently, that it would be improper for me to do anything more than merely second it, but in doing so, allow me to say, that as an original foundation member of this Institute, I have been from year to year deeply interested in its proceedings, and look forward to its publications with high gratification. My great regret has been, that I have been unable to bring more members to join it. One cause why that difficulty exists has been alluded to by Dr. Irons, and that is that people do not seem to know anything about us. I have to begin as it were at the beginning, and when I attack any man and ask him to become a member of the Institute, I have to tell him what we are and what we are about. If our publications could be made more widely known, I think it would very much advance the objects of the Society. (Cheers.)

The resolution was then agreed to.

The CHAIRMAN.—I now call upon any members who have any suggestions to make as to the better management of the affairs of the Society.

After an interval.

The HON. SECRETARY.—As there are a large number of persons present not members of the Institute, I have had the Paper of "Objects" distributed in the room. May I be permitted to say a few words in regard to the first, which is not always thoroughly understood. We say, "to investigate fully and impartially the most important questions of philosophy and science, but more especially those that bear upon the great truths revealed in Holy Scripture, with the view of reconciling any apparent discrepancies between Christianity and Science." Now some seem to think that the Society's sole aim is to act upon the last portion of that object; but if you look over the list of our publications, you will see that there are several purely scientific and philosophical papers among them, such as these;—"The General Character of Geological Formations;" "Falling Stars and Meteo-

rites ;" "The Terrestrial Changes and Probable Ages of the Continents ;" "The General Isomorphism of all Crystalline Bodies ;" "Geological Chronology," &c. Our meeting on the 6th inst. must have shown all scientific men that our doors are open to them to advocate their views. At this meeting we had Dr. Carpenter, Mr. Evans, and many others holding opposite views, and all were heard with equal attention. With regard to the remark that our Transactions are not procurable at booksellers' shops, I may mention that last December a letter, with a list of our publications, was sent to every leading bookseller, but I shall be most happy to meet any suggestion that may tend to the advantage of the Institute. (Cheers.)

The Rev. Dr. BOULFEE then read the Annual Address :—

### ANNUAL ADDRESS.

**T**HE papers usually read before this Institute treat of some one definite subject of inquiry. The Annual Address may be more varied and more discursive. It may pass in review the work of the past year, or it may take a general survey of the present position ; or it may glance at the views, the expectations, the necessity, or the use of this Institute.

To these last questions I propose to address myself. I wish to set forth those considerations which in my judgment justify, and more than justify, the existence of this Society. These considerations are sufficiently familiar to the Council and the great body of our members. But I presume we do not here speak to a little circle of our own ; we desire to speak to the world. I think we shall have no difficulty in setting forth such a case as may give to our Institute a very strong position in the eyes of our countrymen. The objects of the Institute have been clearly set forth in the brief paper which all members possess. It will suffice to recite the first of those objects :—"To investigate fully and impartially the most important questions of philosophy and science, but more especially those that bear upon the great truths revealed in Holy Scripture, with the view of reconciling any apparent discrepancies between Christianity and science." Without going further into the arrangements contemplated by the Society in its work, this one quotation sufficiently indicates a feeling of necessity pressing on the founders and managers of the Institute. It indicates a state of warfare now existing between a powerful section of scientific men and that which we believe to be God's word. They would themselves say between science and the Bible ; but we utterly repudiate the idea as

applied to either of these truly interpreted. The philosopher and the theologian have often been in point-blank opposition. But after a contest of 1,800 years, in which both the philosopher and the theologian have often been worsted, and forced to retire from a false position, Scripture and science stand as they have ever done. That is, revealed truth and discovered truth either agree, or at least run parallel, in their never-opposing course.

The fact of such a state of warfare is no new thing. Christianity was cradled in the midst of storms, and grew vigorously during the early centuries amidst contending tides of thought. Underneath the surface of apparent so-called orthodoxy in the middle ages, conflicting currents of opinion ran strongly. Since the Reformation these have come into more manifest collision. As the coral-like growth of science has brought new ground to the surface, the eddies of opinion and theory have run more sharply between the new truths of science and the old truths of Scripture. It cannot well be otherwise. Nor is this in all respects to be deprecated in an age of slowly and unequally accruing facts. Our contests are seldom about the facts, excepting occasionally about some things rashly asserted to be facts. Our contests are chiefly about opinions and theories, supposed, rightly or wrongly, to arrange those facts in due order of coherence and dependence, or else to follow from those facts.

There is nothing essentially new, therefore, in the conflicts now being waged between belief and unbelief. But they have assumed in some respects changed proportions. It belongs to the increased nervous sensibility of human society as a whole, that these collisions are felt more deeply, and over a wider surface, and therefore attract more general notice. Let me illustrate this difference by one name. That of Darwin is conspicuous in science. But the fanciful theories of the Darwin of the days of George III., together with the more solid achievements of Priestley and the rest of their coadjutors, however familiar to the literary Englishman, were in fact scarcely known to the nation. The Darwin of Victoria's days has made every reading mechanic familiar with the ideas of the strange legendary history he has framed for the descent of man; a legend in comparison of which the grotesque transformations of fairy tales may retire abashed and discomfited. Darwin the grandfather, and Darwin the grandson, will thus precisely illustrate the changed conditions which years have brought, and with which we have to deal.

This change is formidable just in proportion as it extends more widely, and therefore, in the view of the believer, affects

the eternal interests of a larger number of immortal beings ; and also in proportion as it extends more deeply, and therefore in the view of the moral philosopher and the politician, shakes the very basis of society, the fundamental distinctions of right and wrong, the accountability of man, and therefore the very existence of civilization.

If such views may be decried as the panic utterance of the divine whose craft is in danger, none can well take exception to them when no less a personage than the Prime Minister of England has thought it his duty to enforce them on his countrymen with all the weight of his position, and the power of his eloquence.\* "It is not now," said he, "only the Christian Church, or only the Holy Scripture, or only Christianity, which is attacked. The disposition is boldly proclaimed to deal alike with root and branch, and to snap utterly the ties which, under the still venerable name of religion, unite man with the unseen world, and lighten the struggles and the woes of life by the hope of a better land. . . . Upon the ground of what is termed evolution, God is relieved of the labour of creation ; in the name of unchangeable laws He is discharged from governing the world, and His function of judgment is also dispensed with, as justice and benevolence are held to forbid that men should hereafter be called to strict account for actions which, under these unchangeable laws, they may have committed."

This is the grave responsible utterance of the Prime Minister of England. It is a sufficient justification in itself for the existence and the action of this Society ; for it indicates a special line of study, investigation, criticism, and controversy in which believing men of science may unite, and in uniting, encourage each other to resist this appalling spirit of destruction. We do not pretend to possess the suffrages of all such persons. Many may think they can do their part more effectually in an independent position. Nor would we dispute their judgment if they will manfully stand their ground. Still a very important place is left for combined action, and that place this Institute is calculated to maintain.

Those who are familiar with the men and things now in debate will need no more. But for more general use it is necessary to come down from general charges to specific indictments. The case for the necessity of our operations is this, that the very foundations of society are being cut away. It is no mere question of theologians or philosophers disputing

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\* Address delivered at the Liverpool College, Dec. 21, 1872, by the Right Hon. W. E. Gladstone, M.P.

on questions as to which ordinary Englishmen are very tolerant. But the question now at issue is no other and no less than this,—father, child, husband, wife, brother, sister, master, servant, citizen, trader, or whatever other relation there may be between man and man,—is there any, I will not say hope or even possibility for a future life, but is there any real basis of right and wrong, is there any morality, is conscience a mere accident of brain-formation, is there any responsibility—nay, is there any reason, excepting a vague idea of inconvenient consequences, why unbridled licentiousness should not run riot, not only in the streets, but in our families?—Nay, why should there be that monopoly called a family? In what respect, if at all, does man differ from the beast that perisheth? Is he, after all, only a more highly developed and more perfectly organized brute? It will be my business to put these questions plainly and simply, avoiding technical expressions, and in plain English, to ask our countrymen to look these things in the face, and to say whether they will have them.

We have spoken of the existence of a chronic state of warfare. I shall not attempt to account for its present condition, nor to define the share to be attributed to German philosophy, to French indifference, to English materialism, or whatever else may be supposed to exercise influence. The warfare exists—it is carried on by allied forces, themselves in many things discordant, but agreeing in waging incessant warfare against Holy Scripture; and some of them boldly advancing to practical if not avowed Atheism. We may divide these forces into three principal arms: Historical Criticism—Physics—and Metaphysics.

Historical criticism labours to overthrow the credit of Holy Scripture with an almost inconceivable diligence. All the resources of immense learning have been brought to bear upon the language of those ancient books. Every memorial of antiquity has been eagerly ransacked to find, if it might be, some conflicting fact. The simple, artless Hebrew words and statements have been treated as men would construe hostile Acts of Parliament in the effort to extract some contradictory meaning. It has seemed to give zest and pungency to the researches of the geologist when he thought himself on the track of some discovery which might clash with a real or supposed Biblical statement.

If a book could have been overthrown, this Book must have fallen overwhelmed and ruined. No book in the world is so vulnerable to all appearance. It lays itself open at every point. It is full of history, topography, antiquities, both social

and political. It lays down, indeed, no scientific theories, but scientific matters are approached and touched upon perpetually by its writers, men ignorant of science, and belonging to similar classes to those who of old burdened every page with unscientific nonsense. Yet on all these grounds it is in the judgment of vast numbers of men of the highest learning, absolutely unscathed by all the appliances of modern investigation. If the Book were not what we believe it to be, it could not, in this vulnerable condition, have stood such persistent and searching criticism. It has come forth from the fiery ordeal of the last quarter of a century better known, better understood, freer from mistaken interpretations than it has ever been.

This field of investigation has been diligently and worthily cultivated by this Institute. But there is another ground altogether on which the assault is now made, and on which the self-complacence of modern thought has often adjudged the victory to the assailant. You may answer every objection—geological, topographical, arithmetical, and all the rest of the motley array—and you are then met with the point-blank assertion that the natural indeed exists, or seems to exist, whichever it may be, but that there is no supernatural. That the Book, therefore, is venerable, majestic, a repertory of noble thoughts, and a true record of ancient traditions and of the legends which were believed of old, but nothing more. That miracle is impossible, or at any rate can never be proved, and that, to say nothing of the miraculous facts recorded in those pages, the very idea of a revelation, being a supernatural communication from God to man, must be *primâ facie* discarded. Does not the very recital of this dismal belief seem to us like one of those sea fogs which some sudden indraught of air has often brought over the landscape? We stood on a promontory; seaward a dark gloom was brooding over the waters; but around us a midday sun was bathing in light and warmth the rocks, the grass, the trees, the abodes and the works of man. Onward steals the fog, and all is changed; each object, indeed, is there; the sun himself has lost no particle of his radiance, but he is lost to sight, and cold, dank, and dark and cheerless is the face of Nature. So is it with that fog of scepticism and that Eternal Sun. Must there, then, ever be that cold cheerless separation? May not one ray of truth glint down from the supernal throne to give some glimpse of light, some glow of warmth, to this poor darkened world? Has there not been—can there not be—*any* revelation?

There are greater depths of darkness yet before us; still

we must dwell here a little, and gather some of the most recent teaching of those who seem themselves not to have descended lower down the cavernous stairs of obscurity.

And here one name rises to us, the name of one to me personally unknown, but whom we continually feel that we could joyfully take for a guide whilst he so clearly, so gracefully, and so lovingly explores the secrets of nature, and guides us so attractively through the delicate intricacies of chemical analysis, or discourses to us so eloquently and so truly of Alpine heights, and the strange glacial flow of the ice-rivers which fill their valleys. Need I mention (which I do with all due respect) the name of Professor Tyndall? There is often an elevation of tone,\* and there is a reverence in speaking of God, which would encourage the hope that he recognizes some spiritual relation of man with Him. But whatever this may be, this eminent man is diligently occupied in destroying, as far as he can, certain fundamental parts of all revealed religion, I had almost said of natural religion too. And this, not merely in scientific treatises which the few may read, but in addresses† to working men, and in elementary‡ accounts of physical phenomena intended for the young. I may particularly specify these: the possibility of miracles, the belief in final causes, and the use of prayer, at least in any matter connected with the physical arrangements of the world of matter; and how far this leaves anything mental or spiritual in man not so connected it is difficult to say when speaking of these ultra-materialist theories. All these are capable of reduction into one simple and over-mastering theory of the universe. The illustrations drawn from the operations of electricity, magnetism, heat, chemical changes, and other phenomena of matter, are varied with an exuberance of knowledge and charming clearness, but they are all meant to point to one simple theory, which is this: All matter is composed of elementary atoms, which, under the influence of something called *force*, combine and re-combine into the endless forms of nature. That something, called *force*, may assume different modes. It may be manifested as gravitation, electricity, heat, light, or in other modes; but whatever these may be, their sole§ original source is the sun. It is, moreover, largely held that no possible addition can be made to the stock of force in the universe. It may be latent, or it may pass into different modes, but it is ever and always the same;

\* *Fragments of Science.*

† *The Forms of Water*, pp. 315-324.

‡ *Ibid.*, p. 71.

§ *Fragments of Science*, p. 91.

and it acts, and can only act, according to laws, many of which are discoverable by science, and which are absolutely invariable. I am not here concerned to point out how much of this is pure and absolute theory, accepted for the present by leading chemists as best uniting into one view the facts yet known to them. Nor can I do more than refer in passing to the admirable paper recently read before this Institute by Professor Kirk, in which the whole of this molecular system of matter, and this misleading notion of force, is passed in searching critical review. It might be all true, and yet one thing more potent than all these has been omitted, and that is the will of an intelligent Being. It may be that the agency of the sun stored up those magazines of carbon in the depths of the earth. But the intelligent will of man extracted the iron and the copper from the rock—fused, purified, and shaped them into the mighty but yet inanimate engine. The intelligent will of man brought forth those stores of carbon, and kindling them generated the heat, which, passing into the water, became the power which from the expanding steam caused piston and crank to move with obedient energy. Yes, if the will of man cannot create force, it can accumulate it, and direct its action in modes beyond the imagination of former ages. And shall this mechanical success blind our minds to the action of something infinitely higher? That Divine will which is the origin, and not only the guide or transmuter of all force, is this to be accounted less potent or less active than the poor human will, which leads us to understand something of what that Infinite Energy must be? Surely we may dismiss this unworthy thought of God, which shuts out alike, on the same ground, all miracle and all prayer. A child may wind up its top and send it forth on its gyrations, pleased with its musical hum, and anxious that it may spin out its utmost course of revolutions unchecked and untampered with by the longing finger of the intruding infant. But man, who has a will of his own within his breast, cannot readily believe that the Almighty launched forth this revolving orb on its exquisite ellipse, and then withdrew to watch it, so delighted with His own mechanical arrangements that no finger of His own, or of any creature of His, should on any occasion interfere with, or anywise modify the direction of the forces which He appointed to guide the course of the Universe.

Professor Tyndall\* has rightly said that "the physical

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\* *Fragments of Science*, p. 92.

philosopher, as such, must be a pure materialist." Of course he must; it is a simple truism. He claims unlimited right of investigation into force and matter. We grant it. We who have had a scientific education, and rejoice in the liberty of thought which mathematical training gives—a liberty which is not license, because it is regulated by the clearest laws—we grant and we claim that right.

But we demand something more, and as we believe, something higher. The physical philosopher in his laboratory and his study may be "a pure materialist,"—that is, he must honestly and simply investigate the laws and action of force and matter. But he is more and higher than a calculating machine, a handler of retorts, an intelligent microscope, a scrutinizer of matter inert or active. He is a moral and spiritual being; and his relation to the God who made him is something, as we hold, far higher than his relation to the phosphorus or whatever else may be discovered within his brain.

Science is precious to the age, and its development is no doubt leading on to the fulfilment of the purposes of the Almighty. But the age labours under this growing weight of materialism, and material estimate of all things, and nothing simply material can heal it. There is needed will,—the will of man guided aright by Charity, Faith, Purity,—to set in motion those material influences of sanitary, educational, social, and other improvements, to the want of which the outcry of corrupting society testifies. And that this may be so, we go higher, and say there is wanted that higher Will, the Will of God, to act upon the will of man, which is so feeble except in the direction of selfishness, and to cause it to throw off the bondage of matter, and be guided by the Law of Love. Nothing else can, but this would regenerate the world. I abstain from dogma, but every one sees where and how this statement of pure and simple fact and observation translates itself at once into the highest Christian dogma, and the most binding Christian practice.

I do not know how far Professor Tyndall recognizes this action of the Higher Will upon the will of man; but he evidently is so impressed with the mechanical balance of nature, that in material things he at least implies that it must be excluded. "The idea,"\* he says, "of direct personal volition mixing itself in the economy of nature is retreating more and more." And the teaching

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\* *Fragments of Science*, p. 31.

of the subsequent pages may be simply epitomized thus "Probably no one would pray that water might flow up hill; it is equally irrational to pray for smaller and to us more obscure deviations from laws of nature, such as are involved in expecting and praying for deliverances from apprehended calamities. The rain must fall, the sun must shine, the bodily economy must act with all its functions, be they sound or diseased. It is a balanced mechanism. At what point will you with your prayer intervene, and request that irregularity may take the place of regularity to accomplish your desire?" This I believe to be a fair statement of the objection. I suppose that our answer would in the main be to the following purport. The exquisite balance of Nature's laws we admit equally with yourself. But it speaks to us of the action of a Mind of infinite grasp and prevision, and of a Power the source of all that we call *force*. To that Mind and to that Power we are moved by considerations of the greatest weight to believe that we are in definite spiritual relations, and under a definite moral responsibility. When we pray to that Mind and that Power, we also believe that a certain Fatherly relation exists there. When we speak of the laws of Nature we believe that they are never for a moment apart from the Will which guides that Mind and that Power. We do not believe that our will manifested in prayer can bend that Supreme Will contrary to its purpose. On the contrary, our own Scripture defines "confidence" in prayer to be simply this, "that if we ask anything *according to His will*, He heareth us."\* How much is involved in that "*according to His will*," as to manner and matter of request, belongs to Theology to discourse upon. We do not, therefore, pray, consciously or unconsciously, for a violation of the laws of Nature in so far as they are a manifestation of the Will of God. But our sense of His Personal Will operating always in those laws, and as the origin of all that is called Force, is so vivid, that we believe we may ask Him, and He may grant our petitions. And lastly, we do not think that we can justly be required to answer "How can this be?" With, by, or through His own laws, behind which His presence is always to be conceived, He may accomplish our desire. The *modus operandi* of the Divine Will we simply do not expect to define beforehand. "His way is in the sea, and His path in the great waters, and His footsteps are not known." We cannot pretend to suppose that this will be very satisfactory to those

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\* 1 John v. 14.

who demand an elucidation of all difficulties. To them we can only say, with Bishop Butler, "Satisfaction in this sense is not the lot of man."

But time requires us to hasten on. If twilight has been around us in this last discussion, abysmal darkness belongs to the depths into which we are next asked to follow.

We have had a God,\* great and adorable though very far off, recognized, whom we are bidden to "invest" with our highest and holiest thought, though He may be inaccessible to prayer by reason of mechanical necessity. But, now, what if not even this be admitted? What if the deadly logic of Spinoza be valid? What, again, if God be so far off that He condescended not to make us, but only fashioned a sea-jelly in the unfathomable ages, the progeny of which after vicissitudes beyond imagination, after experiencing longings unutterable, and putting forth efforts suggested by the varying necessities of its multiform existence, "climbed up to man." What if Comte be right, and nothing be the fit object of human investigation save what can be seen, and measured, and counted, and recognized by the senses, and all else, if indeed there be anything else, be unfit subjects for human thought, unknown and unknowable. These ghastly speculations, with their multiplying ramifications, form the third branch of the hostile array of which we speak. Metaphysics, used either simply or in combination with physical theories, to efface all the spiritual relations of man. These speculations have been dealt with in many able papers read before this Institute. That there must be many fallacies in the logic, and many slips in the reasoning, which lead to such results we may assume to be certain; and to point out these has been the object of our learned members. But there is one mode of reasoning which our earliest mathematical training rendered familiar, and taught us to give it undoubting confidence. Who remembers not the boyish satisfaction with which, after being led through the series of relations between lines and angles, we came at last to the emphatic conclusion that "the greater was equal to the less, which is absurd," and how surely we grasped the inference that our premises must have been erroneous?

And so, I think with the larger part of the portentous theories which are now paraded before a world which is, alas! ceasing to be astonished, and rather craving the grotesque and the unexpected at the hands of those who are now styled

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\* *Fragments of Thought*, p. 94.

by a new name, "the Thinkers" of the Age. I think with regard to these theories also, it suffices for the most part to state their results. Long has been the series of facts and reasonings; laboured, or perhaps eloquent has been the language; rich the store of illustration; copious the knowledge of Nature; but, now, what is thought to have been proved? Results such as we have already named. Results which deprive man of all spiritual being, of all responsibility, of all moral basis, of all hope. I say at once, and most of my untainted countrymen will say with their old Euclid, "Which is absurd." Your logic must be false, or your premises wrong; you have been led hopelessly astray, and I care not much at what particular step or steps you blundered. Our great philosophical poet may express for us here our indignant sentiment:—

" Shall men for whom our age  
 Unbaffled powers of vision hath prepared,  
 To explore the world without and world within,  
 Be joyless as the blind? Ambitious spirits,  
 Whom earth, at this late season, hath produced  
 To regulate the moving spheres, and weigh  
 The planets in the hollow of their hand?  
 And they, who rather dive than soar, whose pains  
 Have solved the elements, or analyzed  
 The thinking principle—shall they, in fact,  
 Prove a degraded race? And what avails  
 Renown, if their presumption make them such?  
 Oh! there is laughter at their work in heaven!  
 Inquire of ancient Wisdom; go, demand  
 Of mighty Nature, if 'twas ever meant  
 That we should pry far off, yet be unraised;  
 That we should pore, and dwindle as we pore,  
 Viewing all objects unremittingly  
 In disconnection dead and spiritless;  
 And still dividing, and dividing still,  
 Break down all grandeur, still unsatisfied  
 With the perverse attempt, while littleness  
 May yet become more little; waging thus  
 An inipious warfare with the very life  
 Of our own souls!"\*

In these resounding systems, which seem to have for their object the virtual extinguishment of all that we hold to be highest and most distinctive in man, two principal falsities claim our notice in this hasty review. They form part of the great conspiracy for banishing that Omnipotent, Omnipresent Will to which we bow to the remotest distance from His

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\* Wordsworth's *Excursion*, Book IV.

Creation, until He seems to have no personal relations with it, but becomes a mere perspective point from which the lines ultimately radiate. Or else they aim at obliterating Him wholly, and rejecting the idea of any plan or purpose such as a personal Will might impress on the Universe, and human searching might discover. These two falsities are—1st, Evolution in the sense in which it is pressed as a universal law of mind and matter; and 2nd, the denial of all final causes, at least as discoverable by man.

We can but touch upon these here. They have been ably debated in many of our papers. We omit the attempts made with a marvellous ingenuity, based on an immense knowledge of natural history, to build up a system of animal development, whereby the wing of a bird, the flapper of a tortoise, and the arm of a man have been in the course of ages fashioned into their present forms out of one original rudiment to serve their present uses, and not consciously moulded by the Creator according to His knowledge of His creatures' necessities. And we only briefly notice the graver part of the theory which teaches that the moral sense in man, the conscience, the idea of responsibility, is produced gradually in like manner. It is merely the mechanical evolution whereby certain past impressions and experiences of many generations, being recognized as tolerably uniform in their occurrence, become printed on the nervous and brain organism of the race, and by further repetition and evolution attain higher developments in the more civilized races of man.\* We have space for few quotations here, but we may give the words of Mr. Herbert Spencer, held by many of these advanced philosophers to be "the greatest thinker of the age." He says, "I believe [mark the word, and the creed and the credulity] that the experiences of utility, organized and consolidated through all past generations of the human race, have been producing corresponding modifications, which by continued transmission and accumulation have become in us certain moral faculties of moral intuition—certain emotions responding to unjust and wrong conduct, which have no apparent basis in the individual experience of utility." That propensities and character are to a certain limited extent hereditary, and that different races of men have their special moral affinities, we all readily acknowledge. But again, I think, the statement of the theory will suffice. These men may be "great thinkers," they may have

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\* Darwin's *Descent of Man*, vol. ii. pp. 390-2; vol. i. p. 73. Also Mr. Herbert Spencer.

great logical powers and great wealth of illustration, but I hope most of my countrymen, when they find themselves face to face with the conclusion, will again say with their old Euclid, "The greater equal to the less, which is absurd."

The whole range of Christian experience may be viewed by such writers as too visionary for argument; and the notion of a converted heathen may be to them ridiculous; but to us it is at least a great moral phenomenon to be accounted for. There is (if there were but one instance it would suffice) such a thing as a sensitively moral, pure, upright, truthful, conscientious convert from the direst fetichism. I want this accounted for on any principle of development and evolution. If that eminent man will pardon such a use of his name in consideration of the great cause at stake, I want the development of Bishop Crowther out of the little trembling slave-boy accounted for on these principles. I want the transformation of the cannibal Indians at Metlahkatla interpreted to me on evolutionary principles.

I feel myself walking, as it were, on the thinnest ice, which crackles and yields under me at every step when I adventure on these wild theories. They are baseless and absurd. But I go back to the old truth of reason and revelation. God made man, and gave him a reasoning mind and a sensitive conscience, and imprinted on him a moral nature. I then stand upon solid ground. I speak—I do not say as a clergyman—but as a Christian man; and I know that in that plain old truth I have that which harmonizes and draws into itself all the facts of reason, and conscience, and moral responsibility with which I have to deal. This is the true test of a theory, moral or physical. Will it embrace and harmonize (within possible human limits) the observed facts belonging to the case? That which does this best and most effectually is the truest yet attainable. And this is the real ground upon which Christianity (viewed as a moral and spiritual theory, or system) maintains its ground amongst men, and always will maintain it, whilst these mushroom theories spring up and fall off into nothingness from age to age. Alas! they always leave their spawn behind them! But I want now simply to hold up the disastrous issue before us. In the excitement of the Spanish revolution, there was a newspaper published in Madrid under the name of the "Descamisados," *the shirtless*. It was disputed whether it was the genuine organ of the ultra-revolutionists, or whether it was a satirical caricature of their aspirations. In either case it represented, either in fact or caricature, their mental goal of desire. This was their declaration: "Everything for everybody, from Power even to Woman. . . . Our black flag is unfurled. War to the family! War to property! War against God!"

I want to know where the so-called philosophical theories on which we are now touching differ from this black-flag declaration of war? I look for some basis for those fundamental beliefs on which the family and property rest, and on which any idea of human responsibility to God may be based. Where is it? All I am offered by the "greatest thinker" is this: The experience of ages has stamped on nerve and on brain the idea of a practical utility in such institutions; and human life, therefore, naturally moulds itself according to those impressions. Alas! and has great thinking come to this most contemptible issue? Is there, then, no eternal justice? Is our sweet idea of unsullied chastity and delicate purity in the fairest of our race nothing more than a notion of utility generated gradually by some process of evolution in some shameless ape developed into a creature which wears a more graceful mask? One cannot trust oneself to speak as one feels of these notions, which strike the crown from the head of the human race. But, in pursuance of my present object, I ask what will be the consequence of any diffusion of them, however partial, amongst our youth of either sex, or of higher or lower social rank? It is simply ruin,—moral, social, then political. A world without God is simply hell! I can but echo the language of the illustrious Professor Max Müller in his recent lectures on language and thought directed against these evolution theories, when he said that they raise "problems which hang like storm-clouds over our heads, and make our very souls to quiver."

I pass on to the second principle, or, rather, no principle, on which all these Pantheistic or Atheistic theories rest—the denial of Final Causes; or, at least, the rebuke administered, with what seems always to me serio-comic gravity, to any one who shall presume to assign any purpose or object of God in His creative arrangements. It used to be thought an exercise of the simplest common sense to take the eye, with its delicate optical adjustment, on the one hand, and to take the properties of light on the other, and noting their marvellous mutual relations, to conclude that the one was intended by wisdom and purpose aforethought to be acted on by the other. The very clown who moves the pump-handle, and notes that water follows the stroke, was capable of such a deduction; and we thought he rightly assumed that the pump was made to draw water, and that any chance post inserted in the ground was by no means an accidentally less-developed brother to the pump-tree. That wise old heathen, Socrates, asked of one of the sceptics of his day, "Thinkest thou not that He who made men gave them for their use each organ of sense? Eyes to

perceive the visible, ears to receive that which is audible. Of scents, what to us would have been the use had not nostrils been given us? And what perception of sweets and bitters would there have been had not the tongue been wrought sensitive to these? . . . And, moreover, seemeth it not to thee like a work of forethought, since the eye is feeble, to close it with the door of the eyelid; and, that not even winds might harm it, to give it the strainer of the eyelashes, and then to roof it with the eyebrow, that the sweat of the head might not hurt it? Art thou in doubt whether these things were done with forethought, and whether they are the works of chance or of knowledge?"\* But the "free thought" of "great thinkers" knows better than to ask such simple questions. It warns us rather, with a darker and more desperate heathen, Lucretius, to "shun the weakness of supposing that the light of the eye was made bright that we might see, and that the legs were jointed that we might stride, or the arms and hands given to minister to our uses. This is all perverted. Nothing was born in the body that we might be able to use it, but the thing that is born produces the use."†

Who would be a "great thinker," thus to violate the truest instincts of man? Better wield the trowel or carry the hod than pervert our simple and primary ideas of fact and truth. I shall then at least know that I spread my mortar and temper it well, and lay my brick to a true line that I may build a strong wall. And I shall not readily be mystified into fancying that the hand which wields the trowel was less purposely intended and fitted for its manifold labours.

It requires nothing less than that strange deluding power which the human mind can exercise over itself to dim our intuitional perception and acknowledgment of definite purpose running through all the arrangements of nature. It requires all the effort of the process known now as "great thinking" to achieve this disastrous result, and to imagine that with this vast creation spread around us we can learn nothing about its Maker (if indeed it ever had one), and can infer nothing from the manifest fact of purpose as to the existence of an Infinite Mind, in which that purpose was formed.

What is it, then, which we claim the power to perceive, and which we hold that we *absolutely know*? We claim the power of perceiving a principle pervading all nature as far as we can search its secrets. What we thus perceive is the simple obvious fact that everywhere certain means produce certain

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\* Xenophon, *Memorabilia*, i. 4, 5.

† Lucretius, iv. 821-840.

results, and that we can to a very considerable degree examine the means, and see their connection with the results. We say further that this process thus perceived by us is so absolutely identical with our own methods of procedure that we have no hesitation in asserting that such an arrangement as this must come from a mind capable of foreseeing the connection of cause and effect, and from a will competent to ordain and make the requisite arrangement. This chain of intention, purpose, agency, and result we hold to be simply and absolutely certain. That it is so seems to be almost proved by the fact that those who deny it, as distinguished from those who hesitate about it, seem driven to adopt what are, in fact, the metaphysics of Spinoza. If we believe with him that freewill in man is a chimera of the imagination, and that in truth every act of man is a link in a chain of necessity,—that our purposes are merely phantoms possessing no real existence,—that we *seem* to adapt means to certain ends which we wish to accomplish, but that all this is a phantasmagoria, and we are only accomplishing our destiny,—then, indeed, the purpose in nature may be equally illusory with the fancied purpose in our own bosom. But as long as we refuse to surrender our own clear perceptions at the bidding of “great thinkers,” so long will our deduction from our own knowledge of the connection of means and ends, of purpose and results, be to our own minds irrefragable. And why? Because it is intuitional. Because it appeals to our mental constitution as surely as the axioms of Euclid. Because it lies (as Dr. Porter says) “at the ground of all our knowledge as a necessary relation of things, and a first principle or axiom of thought.” On this basis the human mind is built. It discerns arrangement, peculiarities of structure, succession of results. It considers these, it deals with these, it acts upon these, whether in matters social, political, historical, mechanical, or whatever else may be its sphere of activity. To deny the relation of purpose to the connection of cause and effect is for the human mind to deny itself, and to abdicate its own prerogative, as Spinozism does.

The strength of this belief lies in the point already indicated, the *universality* of this connection. Wherever our investigations reach we discern it. The anatomy of our own body, or that of the animal creation generally; the geological arrangement and constitution of the earth; the balance of the oceanic and atmospheric currents, the weight and speed of the planets; what the microscope and the telescope reveal—it matters not where man’s researches extend, they all come back to him laden with the same tidings: here are cause

and effect; here have been mind and purpose, will and power.

Why do we grasp so firmly the Newtonian theory of gravitation, or why has the undulatory theory of light obtained such hold of modern science? Because, as far as our investigations reach, they hold universally. Who that has once dealt mathematically with the delicacies of the variations of the lunar orbit—who that has ever handled the calculations of the planetary movements as they sway to mutual attractions—calculations which in the hands of Adams revealed the existence of an unknown planet—can hesitate one moment as to the certainty of the basis on which such computations rest?

And so likewise, what is the undulatory theory but this,—the hypothesis of light being simply a movement of waves in an ocean of ether that no human eye ever saw, or human touch discerned. And yet, when for the purpose of argument we have assumed that theory, and have calculated the effect of certain influences on the waves of such an ether, we find that our result is absolutely true, and that the phenomena of polarized light correspond to the outcome of our calculation, is there not a strong degree of conviction that our fundamental hypothesis could scarcely be false? It is thus that convictions come home to us in proportion as we discern the universality of the principle we are considering. There is no universality so universal, no certainty of principle so certain, as this of which we speak, the connection of cause and effect, the manifestation of mind and purpose, of will and power, inconceivably great and majestic throughout the universe.

Need one word be added as to the phrase whereby we usually express this idea? *Final causes*. Need I say that we use it of God with all humility, and that we use it in its human sense! Which of us presumes to say what is really “*final*” with the Most High? By this phrase we only attempt to say that in our limited survey, and so far as is given us to follow out the chain of cause and effect, such and such seem the purpose and object of the Almighty. But when viewed from the throne of God, we are deeply conscious that the chain reaches far back into an eternity that precedes and that follows our survey; and that what we call final may be only, as it were, the starting-point with Him.

It may be, therefore, that the expression *final cause*, borrowed from the ancient philosophy, may not be a very correct or a very happy one when applied to the works of God. Still no thoughtful man is misled by the term so as to dream of an actual finality; nor is it fair to make use of it as an argument against reasoning from design in nature, as though this term

implied that we had any notion of fathoming the purposes of the Divine mind. And yet by some notion of this kind, it seems as if we were to be debarred from all that most delightful search into nature which finds a God with mind, will, purpose, and power everywhere. And, again, I will not take the "advanced thinker" to illustrate this unhappy tendency. I will take a delightful book of Professor Tyndall's, written in order to give to young people and the less scientifically educated, clear ideas of the formation and movements of glaciers, and many atmospheric and other phenomena.\* Anything more clear and luminous in its illustrations cannot well be conceived. Yet there comes in this sad obliquity, as I must needs think it. It appears that some writer upon whose book he had chanced, noted the fact of water becoming more dense and heavy down to a certain degree of cold, and then below that and to the freezing-point, growing lighter and rising as the process of crystallization proceeds; so that, finally, whilst in summer the warmer water is found on the surface and the cooler water below, on the other hand in winter the frozen particles cover the lake while the warmer uncongealed particles occupy the depths. And the writer in question called upon his readers to admire this provision of the Divine Wisdom, for that thus the fish which must have perished had the lake become frozen upwards from the bottom, are always able to live in water of congenial temperature when all is winter above them. Possibly the writer may have been inaccurate and unscientific in some of his language; possibly he may have erred in conceiving that this change of condition was peculiar to water, and that it was wrought with the final end that fish might not be destroyed. If so, all this ought to be set right. But was the idea wrong? He who gave the water its properties; He who made the creatures that inhabit the waters, did He not contemplate these results? Did He not know, did He not ordain, that this provision for His creatures should be part of the consequences which would follow from that which belongs, as Professor Tyndall points out, to the wonderful laws which regulate the solidification of other substances besides water. Yes, or else we limit His knowledge, and His wisdom, and we question His universal sovereignty. And, therefore, it was an unworthy thing to take the occasion, not to set right what was erroneous, but to rebuke as presumptuous and almost profane, any attempt to ascribe purpose in this matter to the Most High, or to discover what His purposes may be. And if our children are once

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\* *The Forms of Water*, 314—324.

taught this blank negation about God, while they have greater opportunities than former generations have had of knowing His works, what can be the consequence?

This is the issue to which I have all along desired to bring this question. Many of these gentlemen are possessed of attainments in physical science, such that one would sit joyfully at their feet to learn the facts they have to tell. But when they step out of their own province, and on the strength of acquaintance with physical facts venture on subversive theories, or metaphysical and spiritual problems, they have no special claim to a hearing, and the simplest man of thought may judge them. There are other sciences, and more spiritual knowledge. Why should they go out of their way in their popular teaching to quench faith; to silence prayer; to thrust away the personal God from the knowledge of His intelligent creatures; to destroy, I had almost said, manhood itself?

One of them says, "he has no theory, not even of magnetism." No theory of life or eternity! What is the object of all this? Where is it tending? When conscience is destroyed and responsibility gone, what remains? What basis is left for charity, for truth, for honesty, for chastity? What glimpse of immortality survives? I wish to know what our sons and our daughters may yet be taught. This warfare is in truth "*pro aris et focis*." No altar, no home. The Continental unbelievers are more logical than the English, and are not afraid to discover, and to state boldly the ulterior consequences of unbelief. No revealed God, no conscience, no standard of good or evil—then no property, no family, no right,—then self-love, health, pleasure, utility, must be accepted with the French Encyclopedists as the guides of morality.

All this, in a certain sense, is very well for literary men to play with as a mental toy during the hours of a life of mental excitement. Their own intellectual pursuits occupy, and in a measure, elevate them above the gross and the sensual. But what for others? What shall we say (I tire not of asking it) to our children who have not these literary tastes? What shall we do for the degraded classes of society? Where is the Gospel that we may take into the courts and alleys, and that shall sound as sweet music by the bedside of the sick who is dying in rags and misery?

As I speak thus, the dark shadow of all this scepticism seems to pass away. We also have a science transcendently true and earnest,—a science that rests on a basis as sure as any established physical theory. We have our divine faith, in which he who possesses it rests, because he finds that it

solves the great spiritual problem before which the heart of man trembles. Because it solves it for himself, and because it solves it wherever it is carried amongst all the diverse races of men. And because whilst it does this, nothing else ever has done it. Christ alone has ever really touched the woes of humanity, or given one true ray of divine light to shine athwart the spiritual and moral darkness of a sad and sorrowful world.

And Christ alone holds out the hope of the removal of all that imperfection, and that dumb yearning after something better which characterizes all present existence. This old earth is now reeling onward in its progress, none know whither, the home of racked hearts and transitory joys—the scene of guesses, speculations, and partial discoveries—encumbered with the wrecks and fragments of human wisdom. And this we believe shall pass away for ever. Better so: philosophy and the progress of human discovery have no hope for it. They may ameliorate some inconveniences, but they create others. They quicken the communications of men, but they multiply the mental burdens. They have no peace, no rest, no satisfaction, no love, no pause to the long agony of the world. Death reigns; and philosophy brings to us no life. It is busied in darkening by doubt the light and the life we have, but itself is hopeless and helpless. Nor, excepting the facts of physical science, and all that appertains to them, can it tell us anything new. The Greek mind long ago discussed all those questions of Providence, and order, and chance, amidst which philosophers are still wandering. And still it is true, as that Father wrote of old, “I have read all that philosophers can tell me, but none of them ever said what Jesus alone has said, ‘Come unto me, all ye that labour and are heavy laden, and I will give you rest.’” So he came, and he found rest. And those who come now find rest. And this spiritual truth is as sure as all those physical truths, and the result of the spiritual experiment as certain. Therefore we believe.

And looking on the tumults and strivings of the struggling world, we believe that “the whole creation groaneth, and travaileth together in birth-pangs” (*συνωδίνει*) even until now, and that “we see but through a glass darkly”; and that the day will surely come when the veil shall be torn away that is between man and God, and there shall be “the new heaven and the new earth wherein dwelleth righteousness.” A grand belief—a holy belief—a purifying belief! Who would lose it, and voluntarily descend from the brotherhood of angels to the fellowship of the brute?

Dr. J. ANGUS, D.D.—Mr. Chairman, Ladies, and Gentlemen : I would beg as an outsider to thank the Council for permission to submit to this meeting the expression of their cordial thanks for the paper we have just heard read, and for the other papers read from time to time at the meetings of this Institute. My own feeling is strong and clear that, if Dr. Boulbee's paper were the only product of this Institute, the Society would not be working in vain. (Cheers.) I have only one practical suggestion to offer, and that is, that if the Council could favour us, not with volumes only, but with particular papers in a cheaper form, it would be a great advantage. (Cheers.) I ask the meeting with all their hearts to support this resolution.

Mr. C. BROOKE, F.R.S., V.P.—I beg to second the resolution.

The resolution was unanimously agreed to.

Dr. BOULTBEE.—I beg to thank the meeting for the kind manner in which they have heard me.

Mr. W. M'ARTHUR.—I have great pleasure in moving a resolution which I am sure will be cordially received by every one. We have had a very excellent meeting and have all thoroughly enjoyed it, and I quite concur in the remark made by Dr. Angus, that if this Institute had rendered no other service during the year than producing the very admirable Address we have listened to to-night, it would have conferred very great advantages, and I can only express a hope that the Address will be printed and circulated in some portable form, for I have not heard a lecture for many years that is better adapted to the present circumstances of the times. (Cheers.) I have now to move "that the thanks of the meeting be presented to the Chairman for his occupancy of the chair this evening," and for the efficient manner in which he has discharged his duties. We are under great obligations to him for the deep interest he has shown at all times in the Institute, and for the valuable services he has rendered to it.

The Rev. Sir W. TILSON MARSH seconded the motion, which was unanimously agreed to.

The CHAIRMAN.—It gives me great pleasure and satisfaction again to have the opportunity of attending such a meeting as this, and of congratulating the Society on its great success. I have been absent from you for some time, and it has been a great satisfaction to me to see, by the attendance at this meeting, how the Society is growing in interest ; and it has been no small pleasure to listen to the admirable and eloquent Address which has just been given. It may well be said that we should have performed good work if we had done nothing else than been the means of giving such a paper to the world. (Cheers.) The only alloy I have in my pleasure is, that our noble President, who does most thoroughly appreciate the awful fight in which we are all engaged, was not able to be present, and to have had the satisfaction which we have had, of such a clear exposition, that by the veriest common sense, as well as by the most lucid logic, we can all hold our own opinions against any form of infidelity. While listening to the Address I could not help thinking of the manner in which Professor Tyndall was pleased to deal with an eminent philosopher who did see design in water becoming

lighter with cold, because that philosopher was Professor Whewell. We have heard something of the "semi-scientific lectures of the Victoria Institute," and of "so-called scientific men;" but when we refer to Whewell we know he is acknowledged as one of the European lights of science, and an undoubted scientific man—eminent in science, as a theologian, and also as a metaphysician—one of the greatest geniuses in Europe. If he could see design, the members of the Victoria Institute may be glad to follow such a leader in such a matter. The operations of this Institute have had one effect: we used to hear that such and such things were held by men of science, and instead of argument we had assertion; well, we came forward to challenge these assertions. The leaders of popular infidelity have been welcome here, and they have expressed in their own productions not only the courtesy, but the fairness with which they were met. We court truth and inquiry, but we may be permitted to have a current conviction, from long experience, and from extensive reading,—an address like that which we have heard to-night could not have been given without great reading and thought,—that what we are professing is indeed the truth; that man is something more than a reformed brute,\* and that there is something higher and better than this present life to look forward to. We feel that an honest attempt to support the truth will ever be joined in, by those who meet here, and when we oppose the so-called theories and hypotheses of science, we are not only doing that which is necessary for our own health, and our own mutual system and spiritual life, but that which is absolutely necessary to prevent science being degraded from its true purpose, and carrying out the system of Bacon and Newton.

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[The Annual Meeting being concluded, the Members, Associates, and their friends assembled in the Museum of the Society of Arts, where refreshments were served.]

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\* It is somewhat noteworthy that Professor Rutherford, M.D., F.R.S., when lecturing at the Royal Institution, on the 19th of May, 1874, concluded a remarkable paper "On the brain—its formation and powers," by commenting on the immense difficulty of the physiology of the nervous system, the small extent of our knowledge respecting the mystery of the connection between body and soul, and the advantages which result from an acceptance of the truths of Revelation, however incomprehensible to us in our present state.—[Ed.]

## ORDINARY MEETING, 1ST DECEMBER, 1873.

REV. C. A. ROW, M.A., IN THE CHAIR.

The Minutes of the last Meeting were read and confirmed, and the following elections were announced :—

**MEMBERS** :—G. Archbold, Esq., D.Sc., 21, Richmond Grove, Barnsbury; F. A. Bevan, Esq., 72, Prince's Gate, Newington; A. Brown, Esq., Shelford House, Shelford, Cambridge; Rev. F. Garden, M.A., Sub-Dean of the Chapel Royal, 67, Victoria Street, S.W.; Rev. G. G. P. Glossop, M.A., Newland House, Twickenham; E. W. Gosse, Esq., British Museum; Rev. A. J. Harrison, Shuttleworth, near Bury, Lancashire; Rev. J. A. Hesse, D.C.L., Prebendary of St. Paul's, 10, Leinster Gardens, Hyde Park; Rev. C. Hodge, D.D., LL.D., Professor of Theology, Princetown University, New Jersey; Eliot Howard, Esq., Walthamstow, Essex; F. Howard, Esq., Bedford; H. Howard, Esq., Stone House, Kidderminster; J. Walter Lea, Esq., B.A., F.G.S., F.Z.S., F.R. Hist. Soc., Cor. Mem. Hist. Soc. Dub., 5, The Grove, Highgate; S. Lloyd, Esq., J.P., Farm, near Birmingham; Rev. T. A. Peters, M.A., Alton College, Preston; Rev. W. N. Ripley, M.A., Earlham Hall, Norwich; Rev. R. Roberts, 20, Windsor Road, Ealing; Rev. A. W. W. Steel, M.A., Fellow of Caius Coll., Camb., Caius College, Cambridge; R. Stewart, Esq., Rington Hall, Dorrington, Salop; R. Trotter, Esq., 26, Thurloe Square; W. Melmoth Walters, Esq., 9, New Square, Lincoln's Inn; Rev. Archdeacon E. W. Whatley, M.A., Littleton Rectory, Chertsey; Rev. Canon T. Woodrooffe, M.A., Peper Harow, Godalming.

**ASSOCIATES** :—Rev. C. A. Belli, M.A., Precentor of St. Paul's, Vicarage, South Weald, Brentwood; W. Boufield, Esq., Caius College, Cambridge; Rev. J. Boyes, F.S.A., Shrewsbury; J. Bridge, Esq., F.R.G.S., Heatley House, near Lymn, Cheshire; Rev. J. W. Cobb, Thorpe Hamlet, Norwich; A. F. Coghill, Esq., Brampton Tree House, Newcastle, Staffordshire; Mrs. M. E. Ebbs, 89, Maison Dieu Road, Dover; Rev. G. C. Fogo (Life), Dresden; Rev. W. Jessop, Governor Wesleyan College, Sheffield; Rev. H. Leach, M.A., All Saints' Vicarage, Bradford; Rev. J. S. Lewis, M.A., C. C. Oxon., Llanfyllin, Montgomeryshire; Rev. Canon J. B. McCaul, M.A., 133, Lancaster Road, Notting Hill; A. T. Ritchie, Esq., 19, Crooms Hill, Greenwich; Rev. C. F. Stovin, 59, Warwick Square; Rev. C. E. S. Woolmer, M.A., Exeter Oxon., St. Andrew's Rectory, Deal.

Also the presentation of the following works to the library:—

- “Transactions of the Royal Society.” Parts 145 and 146. *From the Society.*  
 ” ” Royal U. S. Institute. Appendix and Parts 73 and 74. *From the Institute.*  
 ” ” Royal Colonial Institute. Vol. for 1872-3. *Ditto.*  
 “Special Report on Emigration.” *From the Smithsonian Institute.*  
 “Affinities of Science and Religion.” By Rev. H. Leach. *From the Author.*  
 “Compendium of Kaffir Laws and Customs.” By Col. Maclean. *From the Rev. H. H. Dugmore.*  
 “Evolution and Religion.” By Rev. G. Henslow. *From the Author.*  
 “Arcadian Geology.” By Principal J. W. Dawson, F.R.S. *Ditto.*  
 “Earth and Man.” By the same. *Ditto.*  
 “Achaia” By the same. *Ditto.*  
 Butler’s “Analogy.” *From J. Walter Lea, Esq.*  
 Archbishop Tillotson’s Works. 12 vols. *Ditto.*  
 “Essays, Biblical and Ecclesiastical.” *Ditto.*  
 “The Gardener’s Dictionary.” By P. Miller, F.R.S. *Ditto.*  
 “Natural History Review.” 7 vols. *Ditto.*  
 “Genesis of Species.” By St. G. Mivart. *Ditto.*  
 “The Dynamical Theory.” 2 copies. By A. T. Ritchie, Esq. *From the Author.*  
 “Quousque, and the Secret Oath of the Jesuits.” *From W. H. Ince, Esq.*  
 “Man’s Wedded Life.” By the Right Rev. the Bishop of Derry. *From the Author.*  
 “Religion and Science.” By J. Black, M.D., F.R.G.S. *Ditto.*  
 “A Letter on the Right Hon. W. E. Gladstone’s Address.” *Ditto.*  
 “Echoes from Distant Footfalls.” By the Rev. J. Boyes, F.S.A. *Ditto.*  
 “The Examination of Certain Assaults on Physical Science.” By the Rev. J. Woodrow, Ph.D., D.D. *From the Author.*  
 “Twelve Discourses Proving the Extinction of Evil Persons and Things.” By the Rev. H. S. Warleigh. *From L. Biden, Esq.*

THE HON. SECRETARY.—I have to mention that since the 1st of January, the Institute has increased by 101 members. (Cheers.) Certainly in the year 1872 we gained 109, but, by the kind assistance of our members and associates, we may before the 31st secure the few required to make this year’s equal last year’s progress. I have to add that Part VIII., which has been wanting since the year 1867 (it could not be completed on account of the Rev. W. Mitchell’s illness), has now been issued, and every member to whom a copy was due has received it; and all wishing to complete their series of the Transactions can now do so. I have also to state that, in consequence of strong representations, the Council have lately decided to publish a translation of Professor Huber’s reply to Strauss’s last book. The work it is intended to be a reply to has already reached the third edition of its English translation, and it is full time that a reply were published.

After which the following paper was read by the Author:—

*THE IDENTITY OF REASON IN SCIENCE AND RELIGION.* By the REV. R. MITCHELL.

**R**EASON is not one thing in science and another thing in religion. It is not one thing in man, and a different thing in some other moral being. It is not one thing in speculation and another thing in practice. It is the same in all the spheres of its manifestation. The admission that reason conducts to propositions that are contradictory, has been fruitful of evil to correct thinking, and Kant did not escape from the difficulty by appealing to what is called the practical reason. For if reason lands us in contradictions in connection with speculation, there is no guarantee that the same result shall not follow in the sphere of practice. In like manner, Hamilton and Mansel remain unprotected by their appeal to faith; for faith is as really a function of the reason as is the intuition of cause and effect, of substance and attribute, of right and wrong, of the finite and infinite; and if reason may not be trusted in the one sphere, it will be difficult to show why it may be in the other.

2. Mansel is careful to remind us that Kant was "the advocate of the most unlimited rationalism in religion;" a rationalist being one "who, without denying the reality of a Divine revelation, yet maintains that the knowledge and acceptance of it is not an essential part of religion." But what is religion? It is known relations to God, with the duties and privileges involved. Now, reason in religion will demand that if this revelation can be shown to be true, it must be received. It is not an accurate representation of the place of reason in religion to say that it can originate religious truth for itself. It accepts what is originated, revealed, and enforced. Whatever has been done by error to dim the eye, and by evil to deaden the heart, has been taken into view in that system of religion which revelation presents. Ours is an abnormal state of things, and demands special aids to re-establish religious life. Reason then cannot oppose a revelation, for there is nothing unreasonable in it. Reason can only oppose what is false in the sphere of thought, impure in the sphere of feeling, and wrong in the sphere of action. But there are no such elements

in the idea of a revelation. Reason has in natural religion a great foundation in the ideas of God, responsibility, and a future. On that foundation it can stand and deal with matters of fact, of experience, of human and divine testimony, as it regards revelations of God to men. It will demand the healthiest exercise of all the faculties; not degrading itself however, by denying realities, simply because it cannot answer every question about manner or mode.

3. Science is systematic knowledge. And yet we are told by Büchner that "every science, and especially every philosophy, that seeks reality instead of appearance, truth instead of pretence, must necessarily be atheistic," and he adds that "in scientific matters the word God is only another expression for our ignorance."\* Now, is it reason that says all this? Distinguish between reason and reasoning, and the whole thing is plain. It is no fault of the eye that the medium through which it looks seems to distort the object. Even in its own name men of science may insult reason. And so too it is with philosophy. It is to be regretted that Hamilton should ever have said that the last and highest consecration of all true religion must be an altar, "To the unknown and unknowable God." It is also to be regretted that Mansel should have travelled through the sciences of numbers, of magnitude, and of morals, that he might smite reason in the face by declaring "that the infinite is not an object of human thought at all." If the weapon which is thus put into the hands of men be a legitimate one, it has an edge which no arguments about faith can ever break or blunt, but which must cut clean into the heart of the highest interests of men, even as we have seen it do, when used by such men as Büchner. If the finite be the only object of real or positive knowledge; if the "co-existence of the infinite and the finite in any manner whatever is inconceivable by reason;" if "moral reason is not entitled to implicit confidence," then religion is an impossibility, and science, instead of being an illumined temple, is only a dark cave in which blind men struggle for results which can never be realized. We cannot reasonably feel astonished that Büchner should say that "Science is a continual struggle with the notion of God," when in the teachings of Christian philosophers it is maintained that reason cannot know God. This is virtually to exclude reason from both science and religion.

4. Our object in this paper is to maintain that reason is common to science and religion, that in both there is revelation

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\* Büchner: *Man, Past, Present, and Future*, p. 329.

of reason to reason; and that the claims which men of science make to a monopoly of reason are unfounded. Behind the facts and phenomena which science gathers there is reason. It is so too in religion. For it is unaccountable that such a thing as religion should exist, unless on the ground that through all its manifestations reason is revealing itself to reason. Thus reason refuses to regard science and religion as antagonistic. They lie on the same line, and point to the same end. They testify to the existence of reason, without which there could be neither science nor religion. They are thus, as studies, peculiarly elevating in their influence. For there is nothing that we can think of greater than reason. The human reason, with its far-reaching intuitional glances, or its logical processes, is the greatest thing we know on the earth. The Divine reason revealing itself through science and religion is the highest point to which any study can raise a creature. Thus science and religion not only lie on the same line, but that line runs us up to heights where the sublimest realities await us. For amid the heights to which reason conducts us, God reveals Himself as Cause, as Creator, as Lawgiver, as Judge.

5. Since, then, they lie on the same line and lead to the same heights, each is, in its own way, essential to the great ends of human existence. They may not have an equal influence upon human interests, or an equal claim upon human thought; but it were an insult to reason to overlook the functions of either. Reason locks their hands together and bids them walk in light and love. Neither can say it has no need of the other. Science with its many eyes can see something true here, something beautiful there, something useful in another place, and what it finds, it hands over to religion, which, guided also by reason, takes what science gives, and weaves the whole into an offering of wonder and praise. For science is not complete by itself. It exists for something beyond. Science is thought. But thought is not an ultimate thing in our nature, was never meant to be, and cannot be. The nature of mind forbids it. It is related; for example, to feeling; but the highest feeling is that which responds in reverence to the reason that reveals itself in science. It is related also to action, but the highest action is that which rises in obedience to the reason thus revealing itself. Science thus gathers fuel for the fires of devotion that burn upon the altar of the dependent heart.

6. As a thing of thought, science says such and such a thing exists, exists in certain relations, serves certain ends; it speaks to us of body and space, of cause and effect, of means and ends. And religion, guided by reason, takes up all these things, and converts them into grateful song. The pulse of

religion is thus quickened by every law or new illustration of law ; by every fact and legitimate use which is made of the fact in science. While science discovers and classifies and names, religion looks on without fear ; for reason, which gives to science its meaning, gives to religion a shield.

7. There are of course many things to which religion is in one way or another related, which human reason does not attempt to fathom, which it does not require to comprehend at all, which, in fact, it could not, just because it is finite. But that can no more be an objection within the sphere of religion, than it would be within the sphere of science. For in science there are questions which reason does not solve, and the true scientist is not ashamed to say that it is so. In natural science he is made to feel what one of the acknowledged teachers in mental science feels when he says, "The truth is, we are face to face with that final inexplicability at which, Sir William Hamilton observes, we inevitably arrive when we reach ultimate facts." But this impotence of reason to explain all mysteries, can be no argument against its legitimate exercise within such spheres of things as are open to it.

8. In science the divine reason reveals itself as adapting means to ends, and it is within the function of the human reason to find this adaptation. The question of final cause draws deep, and we may not always be able to fathom it ; but unless science means to be laughed at, she must admit its existence, and admit also that she meets it on her every path. Dr. W. B. Carpenter says—"But from the time when I first began to think upon the subject, I had entertained a distrust of all arguments based on those individual instances of adaptation of means to ends, on which Paley and his school built up their proofs of 'design' ; the fallacy of such arguments lying in this, that whilst 'design' unquestionably implies a 'designer,' adaptation of means to ends, how perfect so ever, by no means necessarily proves any particular adaptation to have been intentional." But how, then, one may ask, does the adaptation of means to ends in any one case take place? If not "intentional," is it fortuitous? There is surely intention somewhere. And if the case is one which rises out of the sphere of finite intention, it must be one of intention on the part of the infinite mind. There must, we imagine, be thought and volition somewhere behind the movement of every atom of matter and of every action of what we call law. But thought must regulate volition, otherwise action will never put parts together in any way that will intelligently indicate adaptation of means to ends. If things do not go into position of their own accord, and jump to ends that contribute to the order and

beauty of the whole, it were wiser on the part of men to recognize the intention of some mind. To say that is by "law," is just to say that it is by intention. To say that it is by "physical cause," is to confound a link of the chain with the hand that holds it. If ethereal atoms come together and produce light, if ponderable atoms combine and form acids and salts and stones and plants and animals and fixed stars, and yet in any one case this may be without any "intention," then by whatever name you call the agent, there is a wisdom revealed in that end greater than the something that produced it. It is plain that reason cannot rest in that. If there is adaptation, it will seek an adapter.

9. But this adaptation of means to ends with which science is so familiar, and which reason apprehends, is met with also in religion. In its religious nature, and in the means adapted to its healthy and happy unfoldings, reason reveals itself everywhere. For the correction and expansion of thought, the divine means comes out in the words of Scripture: "Come let us reason together." And since life ultimately rests on thought, the man who reasons with God, and has his thoughts influenced by the thoughts of God, will certainly rise into such life as will harmonize his nature with the will and wish of God. It is a noble attitude which a man assumes when he reasons with the Almighty. In such an act, all that is base is subdued, all that is best, and truest, and noblest within him is brought into full and harmonious play. Reason reigns.

10. Thus, as in science reason is seen regulating inquiry, so do we see it in religion guiding all the higher energies of mind. Power, viewed psychologically, is a blind thing, and cannot find its own way in science any more than in religion; reason must guide it. But reason does not lose her sight when she passes from the phenomena of nature to the phenomena of consciousness and the facts of history. She does not slip from a rock into a quagmire when she passes from the law of gravitation to the law of love. But the law of love links all finite reasons to the supremely lovely. The supremely lovely has the highest claims on the love and admiration and worship of the rational creature. As in science reason is seen contributing to the pleasure of the heart by the beauties and harmonies which it discovers, so in religion reason is seen conferring the highest felicity by means of that boundless blessedness with which she brings the heart into felt contact. Philosophy never said a truer thing than when, through Plato, it said that "God is beauty and love itself." Now, it is impossible that the heart can be in contact with perceived beauty and love, and yet remain unaffected thereby. But religion ever keeps this love playing through

the reason upon the heart. Love is the sunbeam that woos the highest music from man's emotional nature, that melts the iceberg in the sea of frozen feeling, that turns all the passions of the soul into a power resembling the gulf-stream of ocean, that melts the snows of selfishness into rivers that flow as from Alpine heights to water and refresh the plains.

11. Now, since the circle which the magic wand of science describes cannot inclose all the interests of man,<sup>6</sup> it might occur to scientists to ask if it be not the case that religion may have to do with some of them, and even with the highest of them. Moral law, for example, viewed as means to ends, is adapted to man's moral nature, just as physical law is adapted to his physical nature. But morals and religion are closely allied. When Büchner says that "the many religions can stand in no necessary connection with morals," he glances only at the surface of things. It is not true, as he would dogmatically assert, that "morals and religion have originally and in principle nothing to do with each other, and have probably been commingled only in the course of history, and for reasons of external expediency." The tendency to degrade religion by attempting to exalt morality is somewhat strong among a certain class of thinkers in these times. Religion is confounded with some particular form of thought, or act of worship, and the defect, or supposed defect, is seized as an argument for separating morality and religion. The fault is in the minds that confound religion with theology. It may not be a duty to accept a given form of theology, but it must always be a duty to be religious; and if it be a duty, it must be moral. Religion is voluntary obedience to God, and surely that is a moral thing. The axe of Büchner cannot thus cleave asunder what the infinite reason has made one, and what the finite reason can apprehend to be so. Well, regulative ideas are required in moral life, just as they are in scientific life, and reason is seen as the source of those ideas. Reclaiming truth, as required by fallen moral beings, demands reason, just as any new discovery in science needs it for scientific purposes. Reason apprehends and gives forth the law that should regulate the moral volitions of men, just as it guides the scientist as he works in the laboratory or elsewhere. While, then, an exclusive attention to science may have a tendency to overlook many facts and phenomena which concern men, reason will not so allow herself to be blinded. There is, for example, no deeper fact in human consciousness than the fact of moral failure, and of moral weakness as the result of that failure, and of moral want as the effect of that weakness. Now reason takes notice of all this in the religious sphere, and will not allow any scientific bias to turn us aside from its importance. It com-

prehends as its legitimate province the cry which comes up from amid that want. It comprehends also the facts of history, amid which facts is the divine method of bringing relief to the weak and weary heart. It were an act of unreason to shut out these facts from our view. If the scientists collect facts, and deduce laws, and demand that we recognize them, we instantly obey. But we too have some facts to look at, and as firmly demand that reason be not outraged by their denial.

12. Nor must we, by anything that is said about the "impotence of reason," be turned aside from the facts and what is involved in them. Why should not reason be as trustworthy in morals and religion as in mathematics, in perception, in philosophy? There are certain subjective wants that are as philosophically met by certain objective verities,—as that fire is adapted to burn wood and ignite powder, or air to inflate the lungs, or sound to strike upon the tympanum of the ear. Thus reason, as we find it in religion, is the same whose radiations are met in science, in art, in philosophy, and in morals. Religious men have not always been wise in the way they have talked of reason in relation to religion, any more than scientific men have been wise in excluding faith from science. Without faith it is as impossible to give science the victory over ignorance and social inertia, as it is impossible to realize the enjoyment of religion without reason. Within the sphere of science, reason is regarded as competent to apprehend and lay bare nature's secrets, and men have faith in nature because reason can accomplish this task. But why should not reason within the sphere of religion apprehend the condition of obligation, the rightness of worship, and the power of divine love to rebind the human heart to God? If the reason has to do with the microscope and the retort, has it not also to do with the sensitiveness of conscience and the discipline of suffering? If it has some sphere of action in the science of evolution, or correlation of forces, has it no sphere of action amid the yearnings of heart or the intuitions of the moral nature? If it can say, "I have found a new fact in zoology," must it not be allowed to say, "I recognize an old fact in psychology"? If it moves with steps of light over the plains of matter, must it be hindered from showing itself in any way amid the affairs of conscience and immortality? If not, can it, we ask, rightly interpret questions of ethics and psychology, and yet stop short of religion? Impossible. To deny religion is to deny reason, and to deny reason is to deny God. Thus it is that what so often goes by the name of doubt leads to dogmatism.

13. The attempt which is made to bar thought in the direction of religion, does not, as we think, do honour to the

scientific mind. It presents that mind, as we sometimes meet it, as one-sided, illogical, raising a false issue, and seeking its end by false analogies. Its claim to a monopoly of reason is a loud one. And hence it can say with a boldness which is at the antipodes of a noble courage, "Orthodoxy is the Bourbon of the world of thought, and that extinguished theologians lie about the cradle of every science as the strangled snakes beside that of Hercules." (Huxley.) This, to say the least of it, is loud enough. Another writer (Büchner) rather more loud than the former, and who indeed takes the former to task for lack of courage, in not carrying his scientific findings to their logical results, says, "Science has destroyed for ever the distinction between God and the universe." Thus it has destroyed the distinction between reason and the universe. What, then, has science left us? Something less than ourselves. And yet, somehow or other, that universe that knows no God, has formed the conception of God and given it to us; has formed the conception of something greater than itself, and imbedded that conception deep in our nature, so that reason refuses to pause at that universe as its resting-place, while it has the thought of a centre grander and more glorious. Even we, it would appear, have received what the universe did not possess, and to which there is no response. Dumb, deaf, blind mother, if we can call the universe by that name, why did she give us a voice she cannot hear, and great wants she cannot see, and a weakness she cannot relieve, and a heart with yearnings to which she has no response? We have many complaints but no one to complain to. She that formed the ear cannot hear. If science has thus robbed us of the personal God, science should be prosecuted as the greatest thief that ever vexed the human heart. "The hinge-point of the controversy between naturalism and belief in a God," says the same writer, "is the question whether reason is before nature or in it." There is no doubt at all about the answer which he would give. This something that he calls reason is not in his thought associated with a personal God. And yet what can it be? We shall have occasion, a little further on, to see how he gets a human reason evolved. But we have quoted these words because of the admission that reason is met with in nature. When prosecuting science we are face to face with reason. In searching among the phenomena of the universe, in seeking to interpret their meaning, in trying to get at the law or idea or thought that is behind them, science is face to face with reason. Reason is looking out from amid these phenomena, revealing itself to some eye that can see it; thought is speaking to thought. Reason is thus something

greater than the natural cosmos, something which is served by it, and ruling over it. But reason, if the word has any meaning at all, must either be intuitional or ratiocinative; it is something that is gazing at truth, or is distinguishing one truth from another. There is an intelligence, something that knows and that is making itself known. However the controversy may swing, this is a point which the physicist must not overlook. Possibly he may be able, by a little reflection, to find his way to the conclusion of another, who says, "Where reason is there is conscience, where conscience is there is reason." If this conclusion, which is simple enough, be reached, there will be little difficulty in rising to the thought that the reason that is found in nature was also before nature. We are not in the habit of thinking of the conscience of nature. Often strained as language is, it has not been so far abused. But if we must think of reason, we must also think of conscience, and so of reason and conscience before nature.

14. The question of the existence of human reason is easily disposed of by the same writer. "As it regards the human *reason*, which," says he, "is generally considered an insurmountable barrier between man and animals, it is, according to Schaffhausen, only "the result of a finer and more complete organization, as the human body can only be regarded as the finest and most perfect expression of animal organization, it is not a gift of heaven bestowed on all men, nations, and times, but a result of universal education." This reason is, "that higher qualification which proceeds from the proportionate development and completion of all our souls' faculties to which the human family has been gradually matured, and which will conduct it to even greater intelligence." There is plenty of assertion here, but little of either science or philosophy. Still, since there is such a thing as reason, however evolved, its voice must be listened to and its wants met. It will demand authority for the statement that it is the "result of universal education." If the reply be "science," it will again demand how that can be, since through science reason has been face to face with reason in nature through all time. Besides, education supposes something educated. Education does not confer mental faculties on man, it simply develops what exists. It does not create. Education does not confer the religious faculty on man, it simply unfolds and directs it. If in science it can be said that the ray of light neither forms the eye nor the object on which it rests, may it not be said in reason and religion, that the truth received in education neither forms the religious faculty nor the object to which it rises? Is there not in the one utterance as high an exercise of reason as in the

other? If we can say that every house is built by some man, may we not also say that the heart has had a heart-maker, and that he who could make it must understand what feeling is, what religious feeling is, what religious aspiration is, what all the workings of reason are, and have in himself the power of responding to the play of all those higher energies which he has given?

Mr. Spencer will tell us that "the universality of religious ideas, their independent evolution among different primitive races and their great vitality, unite in showing that their source must be deep-seated instead of superficial." But what is thus historically true, is true also from a philosophical point of view. This religious nature is deep-seated, too deep-seated to be disturbed by any erratic utterance of science. Science might as well think of destroying reason as religion. But if science could destroy reason, it would be guilty of suicide, it would destroy itself. Mr. Spencer of course maintains that the religious susceptibility in man "arose by a process of evolution and not from an act of special creation," which is just to say that man arose by a process of evolution and not from an act of special creation, all of which is taking matters for granted which certainly have not yet been proved. For surely the religious susceptibility is as really an original element of man's being as any other that may be pointed out. The desire to know, the love of the beautiful, the felt obligations to the idea of the right, are not more prominent in his nature than the religious tendency. To say that dreams may have given rise to the notion of spirits, and that the idea of one or more gods may have sprung from these creations of a dream, is, to say the least of it, not unlike a condition of dreaming while men are professing to think. Mr. Holyoake's fanciful thought has about as much truth in it, when he asserts that in the "distorted reflection of man's image on the wall as it were of the universe, arose the idea of gods."

15. The claim to a monopoly of reason on the part of science is strongly put by Büchner when he says, "Mankind is perpetually being thrown to and fro between science and religion, but it advances more intellectually, morally, and physically in proportion as it turns away from religion to science." This is what is called "advanced thought," too far advanced, we imagine, in the mean time for not a few who are moving in the same direction. We call in question the alleged advancement, but we have quoted the words as an illustration of the way in which men of science have unnecessarily stirred the hostility of men to whom religion is dear, and claimed for science a monopoly of reason. If the author could have paused just to remind

himself that what he means by science is just the deductions of men from what they think they have seen in nature, he would not have represented mankind as perpetually tossed to and fro between science and religion. For it has yet to be proved that between the correct interpretation of the thoughts revealed in nature and the thoughts revealed in religion, there is any conflict. It is at least neither nature nor religion that is to blame for the battledore-and-shuttlecock play which the author sketches, and he, as a man of science, must bear his own share of the blame attached to such an unpleasant and unprofitable state of things.

16. This claim to a monopoly of reason on the side of science is often based on a professed certainty in result which has not yet been made good. Even within the circle whose unfavourable utterances towards religion have been the strongest, there are divergences in matters of science which make one question whether any certainty is ever to be reached. Theories and systems displace and demolish one another, as it has been said, "like dolls in a puppet-show." Of course, reason will give us certainty in science, but we must make sure that it is reason, and not simply reasoning that we have found. The divine thought lodged in nature is one thing, but the reasonings of men about that thought may be another thing altogether. Many illustrations of false reasoning may be found in connection with both science and religion, and nothing could be more unreal than some things which are declared as certainties; but that fact cannot militate against either the one or the other. No aberrations of reasoning in religion could be more glaring than some of the freaks we meet in connection with science. When, in connection with mental science, John Stuart Mill tells us that there may be worlds in which two and two are not four, we feel that reason is outraged, and that on such a principle there could be no consistency of thought on any question. But it is not reason that makes that assertion, any more than reason gives the flagrant and false findings within the sphere of religion to which the sceptical mind objects. When, again, Mr. Mill declares that "human volitions in particular may come into existence uncaused," we get another of those wild things which anything ever said in connection with religion has never yet surpassed. But surely reason is not responsible for these things. Methods of reasoning may be defective, the logical process may land men in absurdity, but reason rejects the imputation of blame as if she were at fault. And hence science has nothing to present as a result more positive and sure than what reason gives us in religion.

17. But this claim to a monopoly of reason on the side of

science is urged by a logic that is false. "The reason of man," says Mr. Lewes, "is incompetent to know God, because reason is finite, and the finite cannot embrace the infinite." This is the way reason is excluded from religion and relegated to science as its only sphere. For surely the idea of God is the foundation of all religion. But if God cannot be known, it is impossible for man to sustain any intelligent relations to Him. A God who cannot be known must be to man as if he were not. But if he is to be known, it must be by reason in some of its functions. Simply to say that the finite cannot "embrace" the infinite, and cannot therefore know God, is simply to bandage the eyes and then maintain that there is no light in the room. For, to know God, it is not necessary to "embrace" the infinite; that is, it is not necessary to be equal with God. The mind may not inclose the infinite, and yet it may with perfect ease lay hold on it; may not comprehend it, while it may easily enough apprehend it. Just as the physicist apprehends science while he does not comprehend it, feeling that while he has come to the shore a measureless sea still stretches before him, he may indeed know that science has its limits, and that, therefore, it may be comprehended; but even that thought will shut him up to the conclusion that there is something behind science sustaining that finite thing which is the sphere of science. Barrow asks, "Is the ocean less visible because, standing upon the shore, we cannot discover the utmost bounds?" The same thought had been given by Descartes. Cudworth has said "We may approach near to a mountain, and touch it with our hands, though we cannot encompass it all round and enclasp it within our arms." Mansel's use of the word *indefinite* is a defective rejoinder, and leaves the question where it was. For who can think of the finite, as finite, without thinking of the infinite? or the contingent as contingent, and not think of the necessary? Or the temporal, as temporal, and not think of the eternal? There is much meaningless writing about not knowing God because we cannot embrace the infinite. For, what is there even in finite science of which a man may say he knows it perfectly? Mr. Lewes has written much about philosophy, but will he profess to know it so as to "embrace" it? No doubt his thought has gone a good way round the mountain; he knows a little more now than when he represented the formula of causation as "*every existence must have a cause*;" but has he embraced the mountain? If then we can know nothing about any one person or thing till we have comprehended the whole, there is no knowledge on the earth, and, therefore, physicists and philosophers might be a little more humble, and a little less dogmatic. If the

attempt to know God is to "attempt the solution of an insoluble problem," simply because the finite mind cannot know everything about him, no less so is it with regard to science, and, indeed, every other thing the mind can think of. For does not reason in the sphere of science reach ultimates that baffle it? It has gathered together under its eye certain phenomena; it has pointed out some of their relations, but that which is beyond, which the microscope cannot detect, which the magnet cannot attract, which all the fine instruments of science cannot touch or unveil, is the mystery of all, and in the presence of which science, as such, is dumb. As another illustration of defective logic, take the words of Professor Tyndall:—"Trees grow, and so do men, and horses; and here we have new power incessantly introduced upon the earth. But its source, as I have already stated, is the sun; for he it is who separates the carbon from the oxygen of the carbonic acid, and thus enables them to recombine." But it occurs to one to ask him what the sun could do in such a case if there were no vitality, and no organization; let these be given, and the sun may do wonders; but in their absence, what can he do? Now, it is not reason that is at fault here, but reasoning. It is the logic that is to blame. If, then, religion leads men to take in the whole facts, is it not a much more rational thing than a science that either by design or obliviousness excludes an essential part?

18. This claim to a monopoly of reason on the side of science is made by the false issue which is raised. "If religion and science are to be reconciled, the basis of reconciliation must be the deepest, widest, and most certain of all facts, that the power which the universe manifests to us is utterly inscrutable;" so Mr. Spencer says. But is not this a fearful gulf over which science and religion are called upon to shake hands? Why assert that science and religion require to be reconciled? When, amid the harmonies of the universe did they ever quarrel or create a discord? Scientific men and religious men have quarrelled, and there is need now, as on many former occasions, for their being reconciled. But to speak of science as one sphere of truth, and religion as another, requiring to be reconciled, is to trifle. As the child with a ringing sound in his ear may fancy some bell is ringing, so certain men interpret the discordant sounds of their own thinkings as if they were the clashing of realities without.

19. And then, why assume that the "power which the universe manifests" is "utterly inscrutable"? If *utterly* inscrutable, why does Mr. Spencer say that the universe "manifests" it? If "inscrutable," what can he or any other

man know about it, so as to be able to speak about it so freely? He knows apparently that it is, for the universe "manifests" it to us; that is something scrutinized. A thing that is manifested to us is not "utterly" inscrutable. Because he cannot see it with the eye, and touch it with the hand, must he maintain that it is "utterly" inscrutable? He knows that it is the cause, for example, of the motion he meets in natural science. Dynamic science could have no meaning for him but for this fact. Now, unless motion, wherever we find it, be a random, haphazard thing, that power that moves, must have some design in so moving, and some mode of acting so as to reach the design. To escape, or try to escape, from this conclusion, is to falsify reason and deny the truth of science. The "power" is thus not "utterly" inscrutable. All this reason tells us in connection with science.

20. Then, why assume that, if religion and science do require to be reconciled, the basis of that reconciliation must be ignorance—a something inscrutable? Must science and religion agree to put out their eyes, that they may shake hands and not quarrel any more? If the most certain of all facts be that we must remain ignorant of God—or the power which the universe manifests to us, does it matter much whether we have any science? Or can we have any religion? Surely to shake hands over a gulf like that can be no desirable friendship. We refuse the issue thus raised. Why should science, instead of pressing on to the gates of light, strike its brow against so blank a wall? May there not be a knowable Being whose mind and will and heart, revealed in science and in religion, may form the basis of a reconciliation for all our imperfect thinkings? Reason in science and in religion would say there must be such a One, and that He can be known.

21. This claim to a monopoly of reason on the side of science is supported sometimes by a species of *claptrap*, as Mr. Pratt has truthfully named it, which one would scarcely expect to find among scientific men. Let a single illustration suffice. When Mr. Justice Grove was president of the British Association, he asked how the audience could conceive a full-grown elephant suddenly appearing upon the earth, and whence it could have come; "could it have dropped from heaven?" Now, if his audience had been drowsy, and he had wanted to tickle them into attention, such language might have been allowed to pass; but if he meant it to be an argument against the Bible account of the origin of such animals, he was guilty of as mean a trick of claptrap as it is possible to perpetrate. For what has the idea of bulk to do with the question of the origin of life and organization? Size is relative. What might seem big to

Mr. Justice Grove might be a small enough thing to the eye of some other being. The mere monad from which such wonders are made to spring, is surely as great a mystery as the large animal. If this is reason, intuitional or logical, surely religion has no cause to blush for any high claim she makes. But it should be understood that science cannot be advanced by such means. Reason may be insulted, may be opposed, may be disobeyed, but it cannot be degraded, and in the long run triumphs over every mean trick in logic or oratory.

22. This claim to a monopoly of reason on the side of science is made through *assumed superior knowledge of scientific methods*. "No one," says Mr. Knight, "even slightly acquainted with scientific methods and results can for a moment brook the idea of any interference with the laws of external nature produced by human prayer." This is not the utterance of a man of science, but it expresses one of the marked tendencies of a considerable portion of the scientific mind. Like many utterances, however, that are immature and one-sided, it fails to grasp the whole subject. It is not, for example, "human prayer" that "produces" the "interference with the laws of external nature." Human prayer does not act on the winds, on the seas, or on the seasons. Human prayer addresses a Being all-powerful, all-wise, all-good, whose will is supreme in the sphere to which human prayer points. "Scientific methods" must recognize that mighty will and wise thought, and, therefore, cannot reasonably object to the action of that will, if wisdom should see it meet. "Scientific methods," again, must not deny *facts*, historic facts. "Scientific methods" have too many sins to confess in this direction, even within their own sphere, to be allowed to speak with such dogmatic tones. Among those historic facts are to be found startling illustrations of the way in which, in answer to human prayer, there has been divine interference.

23. This assumed superiority of grasp finds in "*Modern Christianity a Civilized Heathenism*," another illustration. "If you come to talk of reason," the interlocutor is made to say, "the most unreasonable belief of all is that the world we see around us is the work of a personal and living God." But is it not more unreasonable to maintain that something that was not living gave life, and that nature, that is not personal, made a being that is—man, for example? If the author did not mean to encourage such reasoning, he was morally bound to offer some reply.

24. This claim to a monopoly of reason on the side of science is frequently recommended by analogies that are misleading. It is said by Mr. Holyoake that "nature refers us to

science for help, and to humanity for sympathy, love to the lovely is our only homage, study our only praise, quiet submission to the inevitable our duty, and work is our only worship." Now, in this rather laboured passage, there are some misleading thoughts which should not be allowed to pass. "Nature" is spoken of as a very intelligent person to whom we are supposed to have applied, and who has thought enough, and authority enough to refer us to science for help, &c. "Duty," again, is spoken of as something that concerns us, while the whole line of thought shows that we are looked upon as belonging to a system in which it is impossible to find a basis for duty. For, if there be no God, how can there be any truth, any rectitude, any duty? If there be no moral agency, it is only trifling with us to talk of submission being a duty.

25. But Mr. Bain will also supply us with an illustration. "I am not able," he says, "to concede the existence of an inscrutable entity in the depths of our being, to which the name 'I' is to be distinctively applied, and not consisting of any bodily organization, or any one mental phenomenon that can be specified. We might as well talk of a *mineral* as different from the sum of all its assignable properties." The materialism of such teaching is evident. But where is the fitness of the analogy? If you take away the assignable properties of the body, do you destroy self-hood? Does the ego disappear when the body passes through the changes to which physiology points, or when the body is laid in the grave? Whatever the "entity" may be, it is that which Mr. Bain refers to when he says "I." "If consciousness be aught of all it seems to be," our philosopher has dropped "the style of men" when he seeks his analogy for mind in a mineral. Reason has a right to complain that what passes for science does not give it justice.

26. Mr. Huxley will give us another illustration. The question is that of natural selection, and the illustration is as follows:—"When the wind heaps up sand-dunes, it sifts and unconsciously selects from the gravel on the beach grains of sand of equal size." But why represent the wind as selecting? Has the wind a choice in the matter? The absurdity is not avoided by looking upon the selection as "unconsciously" made. If fire is thrown into a heap of gold and silver and iron and brass, with a large quantity of gunpowder in which they are imbedded, the fire will ignite the gunpowder; but to talk of the fire as if it were an intelligent agent, and knew the main chance of the moment, and the best way to succeed, would simply be trifling with the question at issue. If such

analogies were used as arguments in connection with religion, reason would not be slow to object.

27. He is not more happy in his effort when he is dealing with ratiocination. "Now ratiocination," he says, "is resolvable into predication, and predication consists in marking in some way the existence, the co-existence, the succession, the likeness and unlikeness of things or their ideas. Whatever does this reasons; and if a machine produces the effects of reason, I see no more grounds for denying to it the reasoning power because it is unconscious, than I see for refusing to Mr. Babbage's engine the title of a calculating machine on the same grounds." And so the greyhound and the gamekeeper essentially resemble each other, and a calculating machine is equal to both. One need not wonder at the tendency of all such teaching to exclude religion; for all moral agency, accountability, and possibility of spiritual experience is excluded. Mental and moral life is simply a bit of clockwork. Indeed, this is the very kind of life he longs for, notwithstanding the protest which the mental instincts have raised. He has expressed the wish that some power would always make him think what is true, and do what is right, on condition of being turned into a sort of clock, and wound up every morning before he got out of bed; and he says if such a power were to make the offer, "I should instantly close with the offer." It is difficult to see what he can mean by the "true" and the "right" in such a state of things. The bee and the beaver do not falsify the true, nor violate the right. Nor does the monkey. How comes it that man does it? And what kind of existence would that be in which the power of doing so is not possessed? A mechanical morality would be a peculiar thing, giving one no trouble, taking away all responsibility, and making a man simply a writing or lecturing clock. And yet if the doctrine of materialism be true, he has his wish; for, logically, one thing will be as true and right as another, and the great power that winds him up, does so without any reason at all for so doing. Science has surely glories enough of her own to arrest attention and maintain her claims upon our wonder and respect, without seeking to array herself in glories that are false, or assuming attitudes of hostility to truths that are more important than her own. When, however, she claims a monopoly of reason, she is guilty of such a false attitude, and ambitious of such a false glory.

28. But reason has some place in the question of *immortality* as in that of God and the moral responsibility of the soul. Büchner, who is consistent enough to carry his principles to their logical conclusions, says, "the more we free ourselves

from all delusive imaginations of a world above us and outside of us, or of a so-called *future*, the more do we find ourselves naturally directed with all our forces and endeavours to the *present*, or to the world in which we are living, and feel the necessity of arranging this world and our life as beautifully and advantageously as possible both for the individual and for the whole." It is of course right and safe to shield ourselves against all "delusive imaginations." But it is simply an assumption to call the "so-called Future" a delusive imagination; and reason will say that in dealing with the question of immortality, man is certainly as rational as when he is speculating on the times when people shall know science so as to observe law, and when the bold predictions of the scientist shall be reached. To ignore belief in immortality because strict scientific evidence cannot be given, can no more be in harmony with reason than to ignore the predicted eclipse because moral evidence could not be produced. To confine our "forces and endeavours" to the present is simply an impossibility. Both past and future demand thought. The circles of practical life round which human energies run are comprehended by a wider circle, from every point of which aspiration rises and touches spiritual realities. The less cannot exclude the greater. The near cannot annihilate the remote. There are wants felt which politics and commerce and philosophy and science cannot meet. The science that "reveals no whence and hints no whither," cannot satisfy reason. Religion does both. And to say that by freeing ourselves of the idea of the future we can make life more beautiful and prosperous, is simply gratuitous assumption. Will history, will observation, will experience allow us to say that men who have excluded the future from their thoughts have ever done much to beautify life? To raise society, thought must find a fulcrum in the idea of the future. Even the men who profess to live for the present, appeal from the judgment of to-day to that of to-morrow. For strength and calmness they need a future of some sort. Hence, even Büchner seeks it after his own fashion. He says, "when we die we do not lose ourselves, but only our personal consciousness, or the casual form which our being, in itself eternal and imperishable, had assumed for a short time; we live on in nature, in our race, in our children, in our descendants, in our deeds, in our thoughts,—in short, in the entire material and physical constitution which during our short personal existence we have furnished to the substances of mankind and of nature in general." But if personal consciousness is lost, why say "we live on"? Why not say that others shall know that we once

existed, but that we do not exist any longer? Would it not be more reasonable to abandon all idea of a future than toil and sweat to forge upon the anvil of the brain such a theory as that? We may be sure that it is not on such a theory that men have stood who have uttered the words and performed the deeds that have beautified humanity and made it prosperous. The circle of civilization will neither be wide nor bright that moves from a centre like that. But it shows how instinctively the mind demands a future.

29. When J. S. Mill speaks of "memories and expectations," he gives us the result of a severe controversy, in which the keenest analyses have not been able to destroy the truth. But what is it that to-day has the "memories," and that hopes to realize to-morrow the "expectations"? It is a "thread of consciousness." The words provoke a smile, but let them pass. What concerns us here is the fact that something has "memories and expectations." Mr. Mill may call that something "the permanent possibility of feeling," or "the final inexplicability," or a "thread of consciousness." We shall not cast about for a name, though the old, in this case, is better than the new. It is enough that there is a conscious something that knows itself as having "memories and expectations." It points to an existence that is not to be the destruction of personal consciousness.

30. Now, is not moral failure one of the most prominent and repulsive of those "memories"? Consciousness comprehends nothing more true than the fact that evil has been done, and that moral judgment has been pronounced. What, then, are the expectations that burst from the black breasts of these "memories"? Unless reason, through religion, has something to say to man on the matter, mental and moral science have led us to the margin of a cruel grave, in which, if not existence, at least the joy of existence, must be buried for ever. But it is just here that religion lights its lamp, that religion flings its arch of light across the gulf philosophy and science cannot span. It is here we see the worth of that life and immortality brought to light through the Gospel. It is here we see how human expectations may be gilded as with glory, for it is here we find religion becoming remedial and bringing divine relief to man. The divine reason provides what the human reason approves and accepts.

31. But Mr. Maudsley will object that "consciousness can never be a valid witness," even in the matter, we suppose, of evil done, or of memories and expectations. Well, but what can? Where can we find any valid testimony if we refuse that of consciousness? Has Mr. Maudsley no "memories," no "ex-

pectations"? If I tell him that he has neither, will he not assert that he has both? Will he then accuse that thread of consciousness of telling lies? If consciousness can never be a valid witness, how does he know it? Simply by appealing to it, we presume. That is, he believes it tells the truth that it never tells the truth. If consciousness can never be a valid witness, how does he know that he found fault with Mr. Mill for favouring the psychological method? How does he know that he is the Dr. Maudsley that wrote on the "physiology and pathology of the mind"? How, in short, does he know anything, if consciousness be not a valid witness? Mr. Mill has said that "whatever is known to us by consciousness is known beyond possibility of doubt." These "memories and expectations" are known to us by consciousness, and surely science is doing a wrong thing when it seeks to seduce reason into the denial of that reality.

32. The spiritual cravings of which men are conscious, are dealt with in a very superficial way by Dr. Huxley. "Natural knowledge," says he, "seeking to supply natural wants, has found the ideas which can alone still spiritual cravings, and in desiring to ascertain the laws of comfort has been driven to discover that of conduct, and to lay the foundations of a new morality." But what are those "spiritual cravings" to which Dr. Huxley's theories would point? Is art, or song, or scenery, or science the object of those cravings? Is it a craving simply for thought from which all angles are gone, and which is rounded into consistency with all other thoughts that are entertained? Is it a craving for intercourse and sympathy with a fellow-creature, who may die any day? This is surely but to touch the surface of the spiritual cravings of which man is conscious. How high in character is a man likely to rise whose cravings are towards a standard set on the foundations of this "new morality"? Are the "expectations" strung upon the "thread of consciousness" confined to the temporary fruits of prudence, of culture, and of what passes for good breeding? Ellicott may well say, "Science may teach us much; but when we gaze far into the *past*, or far into the *future*, we must always observe that it signally fails us; we can find that between the farthest point to which its deductions may help to lead us, and the beginning or the end, there is a chasm that cannot be bridged over." ("Destiny of the Creature.")

33. To tell us, as Mr. Spencer does, "that slowly but surely evolution brings about an increasing amount of happiness, all evils being incidental," is to say little that can meet our spiritual cravings. It is just Büchner's immortality in another

form. We are to content ourselves with the thought that in the "struggle for existence" the weak must go to the wall, and one day there will be a great amount of happiness on the earth. But reason which speaks to us of right and wrong, of reward and punishment, of probation and destiny, has something else and something nobler to say to us about the results of earthly struggle. The martyr's widow bending over the mangled body from which a brave true soul has gone, sees farther into the affairs of the universe than some of our philosophers and men of science can see. Reason does not insult the bereaved mother by simply reminding her that a dead body suffers no pain. Her living, loving heart suffers pain, and it is to her cravings reason through religion seeks to minister. Emerson only caricatures this craving when, in his "Compensation," he represents it as saying, "not being successful, we expect our revenge to-morrow." It is not revenge that reason seeks, but simply that the idea of the right shall never be outraged. The "new morality" only puts to the lips of dying men a cup of Tantalus's water, when it tells them that they may die with the conviction that the world will be wiser one day, and understand better about comfort and conduct. The "expectations" of the soul are not realized by any such treatment.

34. Beethoven styled Bach the "first parent of harmony." The expression may be permitted; but Bach was only reporting what he heard. There was a harmony to which his reason's ear was listening; a harmony which came upon him from the fountain head of all harmony. From the same source religion comes upon us as a song. At its heart there is harmony. Like the soft notes of the flute it steals in gentle tones upon reason's ear, and wakes it into sweet responsive sympathy with God. Like an all-pervading influence, the reason feels its presence and its power; and, understanding by the things that are made, the invisible things of God, exclaims: "Whither shall I go from thy presence?" As the "sounds of music creep in our ears," religion comes upon us as a soothing influence, detaining us in the divine presence, and holding all our nature open to the soft cadences of infinite truth and love. That truth and love may come upon us through a material world or an inspired book. And so, as we think of it, religion and science are alike the servants of reason. They exist for it, not it for them. And while it can make its voice heard, it will allow no separation, will listen to no internal quarrel, no shifting of obligation, and no neglect of respective duty. They are closely linked, and the connection must not be severed. Reason bids them both do their utmost to harmonize a discordant world. It works through both, speaks through both, and

by means of both reaches the high ends that are in harmony with itself. If they mutiny, it still retains its power; they may outrage it, but degrade it they never can. They are the theatres of its manifestation, and it will walk through them, ever revealing how great a thing it is. Hard things are said against it, as to what it can or cannot do; in its very name men abuse it: but nevertheless it shines on, the central glory of the created universe. As Culverwell has said, "to blaspheme reason is to reproach heaven itself, and to dishonour the God of reason."

The CHAIRMAN.—I think our best thanks are due to the Rev. R. Mitchell for this very important paper, and I do not think one has ever been read in this room with which I have more substantially agreed. I cannot see a single paragraph which I am prepared to dispute. The paper contains a vast amount of most important and thoughtful matter, such as I think is pre-eminently necessary at present, when so many atheistic works are in circulation, sapping the foundations, not only of Christianity, but of all religion. (Cheers.) It is now my duty to invite any one present who wishes to do so, to join in the discussion.

The Rev. J. H. TITCOMB.—If I criticise this paper at all, it will simply be in reference to one point where Mr. Mitchell seems to take up an antagonism to the position laid down by one of the writers against whom he is contending, viz., that consciousness can never be a valid witness. Now, in a certain sense this is so, as you will see in a moment when you consider how consciousness is capable of being deceived by the influence of appearances. So far as consciousness goes, it is not valid testimony. Consciousness without reason is no valid testimony; but, aided by the due exercise of reason, it is a valid testimony. The only weak point which I can note in the paper arises, in fact, from the forgetfulness of Mr. Mitchell to put in this distinction,—that while consciousness by itself is not always a valid witness, it may be a valid witness when it is aided by reason. But the paper is so valuable that it seems a shame to say anything in the way of criticism upon it. It draws a very proper distinction between reason and reasoning—a distinction which ought never to be forgotten. I take it that reason is a mysterious faculty of the mind from which reasoning springs, and reasoning is the exercise of that faculty which brings out and exhibits truth to our consciousness. The question, therefore, is, as touching the subject of this paper, whether, when reasoning is applied to religion as well as to science, reason herself has a proper sphere for exercise. I would ask, on what possible ground can that be disputed? It appears to me, sir, that there is only one ground on which we can exclude reason from religion when it is permitted to science, and that is, that there is a greater amount of incertitude in religion than there is in science. But, even taking that, and allowing it to be the case—which I do not at all allow,—still, any

amount of incertitude in a given subject forms no barrier to reason, and is no ground for reason herself being cast, as it were, from her own throne. On the contrary, the more incertitude there is in a subject the grander is the field for the exercise of reason, unless, indeed, you can show that the incertitude amounts to what may be called indeterminateness in the subject. If it amount to what I call indeterminateness, then no doubt reason utterly fails, but that is as true of science as of religion. No doubt there are many propositions in religion which unassisted reason utterly fails to explain and demonstrate, and we are not ashamed to own it; for instance, who can explain, however clear his conception may seem to be, that great doctrine of the Christian religion—the eternal generation of the Son of God? This of itself, though most important as a doctrine, is clearly what I have called indeterminate, and what others, perhaps, would prefer to term transcendental, so that reason cannot explain it. That one person can be begotten of another, and yet be equally eternal with the begetting person, is a proposition in respect of which reason fails, the moment you try to criticise, analyse, scrutinize, and pass judgment upon it. We may say the same of science. There are certain ultimate facts beyond which reason cannot penetrate, as, for example, the arrangement of molecular atoms. We can work out the laws which govern those arrangements in crystallization, in chemistry, and in other branches of science; but when you come to ask why, out of an acorn there should spring the oak, and from other seed the larch, the fir, the cabbage, or the turnip, you come to indeterminateness. So it is in religion, and therefore I say that there are limits, both in science and in religion, to the exercise of reason. Both are on common ground, and one has no right to attack the other as inferior in that respect. But when we get beyond to other questions, however great the incertitude, there is a sphere for reasoning, especially if the facts have antecedents and consequents. To say religion is not a mass of facts with antecedents and consequents is absurd: we should deny our whole convictions and consciousness. The whole of the text of the Apostles' Creed—the creed of the Church from which our Christianity is evolved—is nothing more nor less than a mass of facts—historical facts, which, if true, may be reasoned about. Anything in religion having these antecedents and consequents arising out of facts is surely fair ground for the exercise of the reasoning faculty. Take the existence of the Jews. They lived in the time of Christ. We know it as a fact that Pontius Pilate was a Roman governor in Palestine. We know it from Pliny, and Tacitus, and others, that the Jews existed there, that the Romans had conquered the country and colonized it, and that the facts of the Scriptures are more or less the facts they recognized and had to deal with. There are antecedents and consequents to these facts; and one antecedent in the Scriptures is the prophecy that the race should be scattered throughout the world among all nations, and suffer the most tremendous privations and persecutions. Whether the twenty-eighth chapter of Deuteronomy, in which these curses are first found, was written by Moses, or by some unknown person in the days of Jeremiah, is

nothing to the point. In the time when Tacitus wrote the Jews were a nation occupying Palestine, and owning the Temple, centuries at least before the persecutions they then suffered. There is the fact that prophecy had stated they should suffer persecution and be scattered in all lands. That is a sample of many other illustrations which might be given; and I come back to the same point, that wherever we get hold of solid and substantial facts, which have other facts circling round about them, and wherever the powers of the mind are capable of fastening on points preceding and succeeding, there we get that which is identical, as a matter of reasoning power, with the facts which meet us in science—different in characteristics, but identical in substance. As I have already intimated, I heard Mr. Mitchell's paper with a great deal of pleasure, and think in what I have said I have not in the least invaded the positions of the paper, but have rather strengthened them. (Cheers.)

The Rev. J. SINCLAIR.—I cannot too strongly express my appreciation of the paper to which we have just listened, and cordially agree with the main position which it expounds and fortifies, namely, as I understand it, that reason is the same in all the spheres of its manifestation. What I rose to say is that there appears to me to be a little vagueness and inconsistency in the first part of the paper, which speaks of Hamilton's and Mansel's theory about faith, and takes an objection to that theory. Mr. Mitchell says (section 1) :—

“Faith is as really a function of the reason as is the intuition of cause and effect, of substance and attribute, of right and wrong, of the finite and infinite.”

Now Sir William Hamilton asserts, with respect, for example, to our faith in substance, that it is an ultimate belief; and calls it a regulative principle of belief which our nature affirms; distinguishing between that belief, and those which are the products of reason. Now Mr. Mitchell objects to that way of putting it, and maintains that these beliefs are the products of reason as much as any other. Well, I think that in substance there is no disagreement between them. It seems to me that the position of Sir William Hamilton and Mansel, so far as that is concerned, is incontrovertible—that our belief in these principles is incapable of being proved. We must accept them on the faith that our nature and the composition of our being is founded upon truth. If Mr. Mitchell calls that reason, then there is substantial agreement between him and Sir William Hamilton, but if he objects to his definition, and maintains that there is a distinction between what they mean by faith, and what he means by reason, I cannot for my part see it. I think that there is substantial agreement between them, and the only difference is that Hamilton and Mansel call faith, what he calls reason. There is just one other point. Mr. Mitchell says (section 2) :—

“It is not an accurate representation of the place of reason in religion to say that it can originate religious truth for itself. It accepts what is originated, revealed, and enforced.”

If the existence of a Supreme Being is part of religion—the foundation of it—I think that is scarcely a correct statement of the case. I take it that belief in the existence of a Supreme Being is one of our fundamental beliefs, the same as our belief in the existence of substance or matter. At least, if this truth is not originated by reason, it is difficult to conceive how otherwise it could be received. I do not know whether I make myself clear, but these observations are only offered in an endeavour to bring out the truth. As to what Mr. Titcomb said in reference to the testimony of consciousness, I think he missed the point of the argument on that question. I think we must admit that the testimony of consciousness is our ultimate authority, whether in respect of matters of religion or of science, and so Hamilton puts it. If we admit its testimony in one point, we must in all ; if we reject it in one point, we have no right to claim respect for its authority in any other. The illustration of the feats of a wizard, or the tricks of sleight of hand, does not at all refute or invalidate that position, because what consciousness testifies to in that case are simply phenomena, and there is no dispute there about the subjective. The only dispute is as to the objective, and the adequacy of the senses to discriminate between fact and appearance. Then reason comes in to effect that discrimination.

MR. TITCOMB.—I said that consciousness must have reason at the bottom of it. The paper speaks of consciousness without speaking of reason.

MR. SINCLAIR.—Yes, but the illustration adduced does not support the position of the insufficiency or imperfect authority of consciousness.

MR. TITCOMB.—I might perhaps mention the case of a ghost as a better illustration. A man sees a ghost, and is conscious that he sees it, but his reason must be superadded to it to convince him that what he has seen is an illusion.

THE REV. W. J. IRONS, D.D.—In offering my thanks to Mr. Mitchell for the beautiful essay which he has given us, I must take the opportunity to make, incidentally, some remarks on questions raised by Mr. Sinclair. If I understand the paper rightly, it makes a distinction between reason and reasoning, identical with the doctrine of Plato, who distinguishes between the *νόησις*, and the *διάνοια*. No doubt the *νόησις* has relation to the absolute—the absolutely true and right—the ground where we are able to communicate on common principles with our fellow-men ; but we do not say that besides the *νόησις* there is nothing whatever except the *διάνοια*, or the dialectical or logical faculty ;—far from it. I should, for instance, call the belief in substance an immediate inference in reason from the experiences of a man, but by no means a consciously logical process. We cannot, by any process of reasoning, prove the substance of the external world, nor, in fact, perhaps, the Being of God. It is a much more simple and direct process by which a conscious being, with the image of God stamped on him, finds his Maker, than by reasoning on a set of ascertained premises ; and so also it is not by any argument that we can prove an external world ; but it is that reason acts directly upon our con-

scious experience, and arrives, I will not say at a conclusion, but at unquestionable knowledge of that external world. I felt very grateful to Mr. Mitchell for adhering to that old distinction of philosophy which I feel sure has never yet been set aside,—I mean Plato's plain doctrine—and I am also thankful to him for his refutation, in some slight degree, so far as his limits allowed, of the doctrine of Dr. Mansel as to regulative truth. I cannot help thinking that that doctrine was most painful and mischievous. But the passages which Mr. Mitchell has selected from other writers, in order to comment upon, in this essay, are really touchstone passages. The great value of the paper is that it does select from one philosopher after another, and from one infidel after another, the particular points on which they have gone wrong; for if any one will master the points which Mr. Mitchell has selected, he will at once have a key to those several philosophies to which the essay stands opposed. There are one or two passages in the essay which I cannot exactly accept, but it is so useful and complete as a whole, that I will not be ungrateful enough to offer the smallest hostile criticism. (Cheers.)

The Rev. S. WAINWRIGHT, D.D.—Allow me to say, at starting, that I am second to no gentleman in this room in appreciation, or, rather, in admiration, of the paper with which we have just been favoured; but I am much too candid to attempt to conceal the fact that I was not so well satisfied with it, in its earlier portions, for I met several things there which I was inclined to question; perhaps, however, that arose from the fact that the writer of the paper was anxious to get on to other matter. When Mr. Mitchell got farther on, he had more room, and then he got the hornets in his mailed glove, and crushed some of them, and I was very glad to witness the operation. I think that has been done most effectively, and I concur with Dr. Irons in the opinion that the extent to which it has been done, constitutes, in no small degree, the special value of the paper; but, with all that, I should like to see some of those earlier passages, the accuracy of which I rather question, supplemented with, perhaps in some instances not more than a word, and in others possibly a clause, just to take off their edge. In reference to the observations of Mr. Titcomb, I think Mr. Mitchell is right in maintaining that consciousness is a valid witness, but then I am thoroughly with Mr. Titcomb too. Mr. Titcomb made a just and valuable remark when he said that he believed Mr. Mitchell's intention was to speak of rational animals—of human consciousness, and, if that word "human" had been put in, I do not suppose Mr. Titcomb would have taken the least exception to the remark. If any man can inform me fully as to what consciousness is, in irrational animals, I shall be prepared to admit or deny any affirmation he may make in respect thereof; but at present I do not know what the consciousness of an irrational animal may be, and therefore I cannot admit that the consciousness of an irrational animal is a valid testimony. Now let me mention another point which to me is hardly plain or consistent. Mr. Mitchell says (section 5), "Science is thought." I say "No." I am inclined to suppose that he has seen further

into it and gone further round the mountain than I have, and he may be quite right and I quite wrong, but at present I do not see it. You may depend upon it, that if I had the last word, I should have something to say in defence of my position as to the existence of a radical distinction between science and thought. There may be thought with a great lack of science. Then Mr. Mitchell says (section 13) :—

“And yet, somehow or other, that universe that knows no God, has formed the conception of God and given it to us; has formed the conception of something greater than itself, and imbedded that conception deep in our nature, so that reason refuses to pause at that universe as its resting-place, while it has the thought of a centre grander and more glorious.”

Now I hope not to be misunderstood. Let me say, that with the general scope and design of that 13th section I am thoroughly in accord: I am thoroughly opposed to the doctrine of Professor Huxley that is there quoted in order to be refuted. All I question is the form in which the sentence I have read is put. Separate it from the context, and Mr. Mitchell makes the affirmation that the universe has formed and given to us the conception of God. Now I do not think that affirmation, as it stands, was in Mr. Mitchell's mind. I cannot stand between his own interpretation of his own thoughts and himself, but I feel sure we are agreed on this point, and what I apprehend him to say is, that we have derived a certain conception of God from what we have perceived of the manifestations of mind in the universe. As it is, he has deified the universe itself. I have now done with the ungracious task of picking holes in a work which I like so much; and, when we turn to the obverse of the shield, we find that some of the things Mr. Mitchell has said in refutation of the authorities are really admirable. For instance, in section 16, he says:—

“In connection with mental science, John Stuart Mill tells us that there may be worlds in which two and two are not four.”

I refer to that in order to remind the meeting, and through the meeting to remind the mass of people who, whether they have science or not, have not enough thought when they repeat Mr. Mill's statements, that Mr. Mill has said something which I want them to judge and to weigh, so that they may give such credence as should be given to a man who says that a thing which is a contradiction in terms may be reasonable. Mr. Mill has said that the morality of the New Testament is capable of improvement. I would have that statement weighed by the credit attaching to that other statement. There is just one other point. Mr. Mitchell has spoken of Mr. Bain and the “Ego,” and has quoted Mr. Bain's remark (section 25) :—“I am not able to concede the existence of an inscrutable entity,” &c. I will not attack the writer on that subject—I take the things on which we are thoroughly in accord—but still hope I may say, for the sake of those present, that a most delightful paper was contributed some years ago to *Macmillan's Magazine*, by Miss Emily

Faithfull, on what she calls "Unconscious Cerebration." In that paper the authoress says, among other things:—"I am sitting at the piano; I am going to take part in a duet. A gentleman takes the seat beside me, and unconsciously I note the way in which he does it." She then goes on to describe, in her own characteristic way, how she has her attention fully occupied by the notes of the music—the crotchets, the minims, the demi-semi-quavers—the marks for piano and forte and pedal, and so on. She has all that before her, and never misses a note or inflection, but all the while she is remarking the movements of her companion, and catching snatches of the conversation of two people who are behind her. Her mind and fingers are fully employed by the music, and yet she is unconsciously noting all else that goes on, still it is upon the mere surface and a matter of unconscious cerebration; for what absorbs her is the faculty of delight in the music. Let me now say, with your toleration, that what concerns us especially is the outcome of this paper. Is it not simply that religion is a rational thing *per se*, and that the Christian religion, as contained in a revelation Divinely given, and as distinguished from all others, is emphatically a reasonable thing? The Christian religion especially claims that position, and the Christian service above all things claims to be a reasonable service. The Christian is always required to be able to give a reason for the hope that is in him: "you may of your own selves judge what is right." Reason itself asks us to accept the revelation which has been given to us, and in the profounder mysteries of that revelation, such, for instance, as the nature of God and of the Trinity, my belief is sustained by reason from analogy with the facts of the material world. I cannot take a pebble off the path without finding in it a Trinity—there is the force that keeps its parts together, the order in which those parts are arranged, and the law according to which that order operates; and when I see that trinity of force, order, and law in all things—in a pebble on the seashore, or in a drop of water—I cannot help being struck with the analogy that is thus presented to my mind. In the same way I see a trinity in myself—there is the material and visible element, the intellectual element, and the religious element—and since every man bears within himself that triad, and every pebble is stamped with the mint mark of the same currency, we should receive even that most mysterious doctrine of the Trinity with the feeling that reason is not lacking as the endorsement of the profoundest Revelation. (Cheers.)

Mr. C. R. MACCLYMONT.—I trust you will not think it unpardonable presumption on the part of a new member of this Institute to speak upon such a paper as that now before us. I will not say anything of the character of the paper: but perhaps I may be permitted to say a few words on the subject with which it deals, especially as I come fresh from a place where these questions are treated, not as mere abstract matters, or as matters for the display of ornamental rhetoric, but as questions of vital importance and interest. So far as we ourselves are concerned, I think that our presence here to-night is a testimony and proof that we have accepted these things

and have probably learnt to hold the truth as matter of practice in our daily lives before our reason enabled us to state its contradictions. But we must bear in mind the difficulties of those who oppose us—I speak not of those who attack the faith and boldly call themselves the leaders of infidelity, but of those who are anxious to find out what is right, but have not yet succeeded in their search. Now, Mr. Mitchell's paper opens with the bold statement that "reason is the same in science and religion." Perhaps he will forgive me for saying, that so far as I can understand his argument, it uses "reason" in one sense in one case, and in another sense in the other: it seems to mean *διάνοια* in the one case, and *νόησις* in the other. The methods of scientific truth are not the same as the methods of religious truth, nor are the objects set before the mind of the theologian the same as those which are set before the scientific student. Then Mr. Mitchell has contradicted his own statement when he says that it is the business of theology to apprehend, and of science to comprehend. While religion accepts facts, am I not right in saying that science does not merely accept them—to a certain extent it creates them? Is not each observation the application of a general rule which the scientific man evolved before he began to observe? When Professor Tyndall, or any other practised scientific student, examines a molecule, does he not see things which an untrained eye cannot see, and observe things which an untrained mind cannot find? To investigate the nature of prayer and its purpose; the proofs of religion, of miracles, and of inspiration, the place of historical criticism, and a host of other things connected with religious truth, demands a totally different attitude of the mind. I cannot explain the whole position, but trust that I am not misunderstood if I seem for a moment to take the sceptical side. I am myself a Calvinist, but I have lived amongst those who are not Calvinists, and who would not subscribe to many of the dogmas which are laid down by orthodox professors, and I know that their difficulties in reference to religious matters are very great. There are many men I know—good and honourable men—who, if they could be influenced wisely and religiously, might be turned to much good. Mr. Mitchell has referred to John Stuart Mill. Now, I believe that John Stuart Mill is a teacher who has done much for truth, and Dr. Irons seemed to me to show the distinction between the work of Mr. Mill and of the theologian proper. There is no question that the absolute want of enthusiasm which prevented John Stuart Mill from seeing higher truth, has given him greater accuracy in describing the methods of logical truth. In reading his "Autobiography" you are reminded of the fable of Plato. Some men lie bound with their eyes turned to the shadows. As it is impossible for them to turn to gaze at truth, they seem able to gaze more steadily and calmly at the shadows, and so make up in precision for what they lose in breadth. John Stuart Mill has done much and good work, and his work must be understood in relation to religion, before we can successfully grapple with the errors to which his school is attached. This is the more necessary on account of the peculiar state of the religious

and philosophical thought of the present day, when all sorts of mediæval questions are coming back upon us, and the old Radicals and Tories talk about their constitution as Bacon used to talk of the philosopher's stone. The question of *intelligo ut credam* or *credo ut intelligam* is really the question for the young men of the present day, and we should recognize the fact that the difficulties in the solution of that question stop the way to some of the highest and noblest truths. (Cheers.)

Dr. IRONS.—May I make an observation upon what Mr. MacClymont has said in reference to myself, when alluding to John Stuart Mill. I should be most anxious to obviate the thought in his mind that I had any sympathy with the philosophy of Mr. Mill. I feel that Mr. Mill's peculiar difficulty was that which he has himself plainly admitted,—that he had not, and knew not, that high reason which was Plato's *νόησις*; and I think the great lack of *νόησις* in Mr. Mill's structure is sufficient to account for his abnormal logic. I feel, of course, that his system of logic is full of interesting and suggestive matter, but as a system it is most flagrantly imperfect, and must be so, because he seems not to recognize that very faculty which must know the first premise of any argument. He finds his first premise in any syllogism haphazard. He has no discernment—no knowledge. He begins with a plunge, and when he has made it, no doubt, he strikes out with considerable intellectual muscularity; but how he finds himself in the stream at all I cannot imagine. As to what was said by Mr. MacClymont, almost the same course of thought would seem to my mind to meet the difficulty which he has suggested. A reasoning man must grapple with the true, the reasonable, and the right, and that is external to himself; otherwise every man is to himself a rule and standard of all thought and truth, internally,—which is absurd. He expects that which is reasonable in him to be recognized by the reasonable beings around him: consequently he directs his mind to some supreme rule above him; which is what Plato refers to. It is a direct motion of the mind instinctively towards the truth, which is much higher than reasoning; and that is Plato's *νόησις*.

Dr. WAINWRIGHT.—Will you allow me also to add a word. I have always made a stand, as a matter of principle, against the religionism of some of the speeches that I have had the good fortune to listen to here, and I have always taken the side of the scientists against the religionists as such. The very fact that I have done so gives me justification in saying that I should be sorry to go away to-night thinking that no voice of dissent had been raised against what I have understood to be a defence of John Stuart Mill in this room. Mr. MacClymont has spoken of the importance of not misrepresenting our opponents. I speak in the recollection of many present when I say that I have certainly, in one or two instances, rendered myself conspicuous by undertaking to put some right in that respect. I have the strongest sympathy with Mr. MacClymont's view as to the necessity of apprehending rightly what our opponents say, and my controversy is limited to the sentence I have quoted. I say it is thoroughly unscientific, and utterly unphilosophical to affirm, as John Stuart Mill has done,

that the morality of the New Testament is capable of improvement, and therefore I have a right to question the full power of perception of what is beautiful and good in the mind of a man who, with all his remarkable intellectual gifts, has yet been so purblind to the highest and noblest truths. (Cheers.)

A MEMBER having made some remarks to the effect that if he understood the intent of the paper aright, it was to show that reason directed us to religion, and proved to man that there was a God; if so, he dissented from it.

The CHAIRMAN.—I confess I feel a very strong sympathy for the paper before us, and I think my friend on my left, in his zeal against human reason, very much resembles the man who was so absorbed in the work of sawing off the branch of a tree that he forgot he was sitting upon that very branch, and, of course, when it was severed, he fell. If human reason is untrustworthy, we have nothing to trust. We have no other light whatever to guide us. Dr. Wainwright threw out one remark which he did not carry to any conclusion, but on which I should like to hear Mr. Mitchell's opinion—I mean as to unconscious cerebration. No doubt in our own minds we do many acts unconsciously. When I am writing I often put a thing away from me, as it were, altogether, and yet I afterwards find that my mind has been unconsciously acting upon it. That fact is noticed by pantheists as showing that there may be an unconscious intellect in nature; but my answer to that is: "because such a thing is an attribute of the conscious mind, is it therefore an attribute of this table?" (Laughter.) There is that difficulty however, and I think it is one of the pantheistic objections which has the most plausibility. I was surprised to hear the way in which Dr. Wainwright criticised the passage in which Mr. Mitchell declares that "science is thought." I have yet to learn that the subject and predicate of a sentence are convertible things.

Dr. WAINWRIGHT.—Do you mean that science is thought?

The CHAIRMAN.—No, but not all thought. There is other thought which is not science. I deny that the proposition is convertible.

Dr. WAINWRIGHT.—Do you mean that thought is science?

The CHAIRMAN.—I mean that science is thought—that it is the result of thought; but I entirely deny that thought is science. I understood Dr. Wainwright to argue that the proposition was convertible. Then there is that passage in the 13th section about the universe forming a conception of God. I own that I understood that passage as ironical.

Mr. MITCHELL.—Exactly so.

The CHAIRMAN.—There has been a great misapprehension on the part of some persons as to reason and reasoning. I apprehend Mr. Mitchell uses the term "reason" as meaning the whole of the intellectual faculties of the human mind, some of which have a foundation in our moral conception, and that he includes the intuitive faculties and those things which we cannot help believing. I suppose Mr. Mitchell to speak of reason not in any narrow sense, but as including the whole intuitive power, the reasoning power, and various other powers whereby the mind perceives truth. My belief in an

external universe is a thing which I cannot help. So, again, I cannot help believing that the future, under similar circumstances, will be like the past. That is another truth independent of all reasoning: to say that it comes from experience would be wrong.

Dr. IRONS.—It is reason operating in the midst of its circumstances.

The CHAIRMAN.—To say that I arrive at that conclusion from an act of reasoning, or from experience, is not correct. There is some principle in the human mind under which I cannot help believing: I apprehend that that is the general sense in which the term "reason" has been used by Mr. Mitchell, and, in that way it is possible to attach a consistent meaning to the term. I still hold with the first passage in the paper, that reason, whether exerted upon philosophy, science, or religion, is substantially the same principle. The subject matters differ most widely, and, of course, I might exercise that faculty in a different manner; but to say that reason does not lie at the basis of religion, as well as at the basis of anything else, is simply absurd. (Cheers.)

Mr. MITCHELL.—I rejoice at the discussion that has taken place upon this paper. Had I not expected discussion I should not have come all the way from Manchester to-day; but I wanted discussion, and I have been glad at the discussion we have had. Let me, as the author of the paper, express my gratitude for the many words of kindness and encouragement that have fallen from the lips of all the speakers. There have been some points which have been objected to, but the only one that I cared to charge my memory with has already been answered by the Chairman: as for the rest, the various gentlemen who have taken part in the discussion have answered one another, and I am profoundly grateful to them for so doing. The question which has been raised about unconscious cerebration has been to me for some time an exceedingly interesting one, but I do not know how any one can be unconscious of a thing and yet note it. However, I will not enter into that aspect of the discussion. In justice to Mr. MacClymont I ought to say that I do not depreciate any of the men whose remarks I have subjected to review in my paper. I have spent many anxious hours—many earnest, thoughtful hours—in wading as best I could through their works; and I can assure you that it was with no disrespect for Mr. Mill, or any other author, that I put my finger on these weak points. I put my finger upon them simply as points around which the whole question at issue seems to gather; and I trust Mr. MacClymont will not think there is any unreasonable opposition on my part to that class of men, or any unwillingness to take hold of what truth they represent. But at the same time we must all admit that in writing a paper of this kind you cannot discuss every point. Some friend has referred to the poetical character of the paper. That is a discovery to me. I was not aware that there was anything of that kind in it; certainly, there was not meant to be. But you know that when we have to meet all classes of men, and to speak so often, we do get into

certain ruts—ministerial ruts,—and it is very kind of Dr. Wainwright to take us out of them occasionally, and remind us of our duty in relation to the scientific world. I am afraid I must not, at this late hour, venture on anything like a reply. My paper, however, is understood, and though it has some defects—though, if I had to write it again, there are some expressions that I might modify,—still the whole line of argument would remain as it is. (Cheers.) As to the difficulty raised by Mr. Sinclair, I can only say that I should just like to have an hour with him, in order to discuss that question of faith and reason as discussed by Mill, Hamilton, Mansel, and others.

The Meeting was then adjourned.

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ORDINARY MEETING (HELD AT THE HOUSE OF THE  
SOCIETY OF ARTS), JANUARY 19, 1874.

THE REV. ROBINSON THORNTON, D.D., VICE-PRESIDENT,  
IN THE CHAIR.

The Minutes of the last meeting were read and confirmed, after which, the following paper was read by the Author :—

*BUDDHISM.* By THE RIGHT REVEREND BISHOP P. C. CLAUGHTON, D.D., Archdeacon of London, &c. &c.

IN consequence of the many urgent engagements which I have to fulfil, I have not had time to do more than put down simply what many may think a very superficial account of Buddhism as I have myself met with it in the East. I do not profess that this paper is more than that. What acquaintance I have with Buddhism is not derived from books, but arises simply from my acquaintance with Buddhists themselves. At the same time, I should like to say that it is not simply due to my having lived in the country a certain time and having gone among the people during that residence, but also from the fact that I have had much more knowledge of, and acquaintance with the Buddhist priests than other missionaries, and almost more than any other Englishman, for the time I was among them. In point of fact, I introduced a sort of change of policy with regard to our missions in Ceylon. I found it was the custom of missionaries to avoid the priests and to go only among the people, because they thought the priests were impostors and that the people were deceived. I did not think that was a fair view to take of the case, although it was perhaps natural that it should suggest itself to simple missionaries going out to teach the Gospel of Jesus Christ. I rather reversed the policy, and when I came to a strange part of the country I first inquired for the nearest priest—sometimes a college of them: sometimes only an individual priest—and the nearest temple. In that way I went much among the priests, and I have further to say, that I have great pleasure in bearing testimony to the almost invariable candour and courtesy with which they received me,

I propose on the present occasion to bring before you the state of Buddhism as it exists in Ceylon at the present day, rather than to recur to the earlier traditions of its history, which, however full of interest, are more or less doubtful as to their accuracy; and, besides, are within the reach of any who are willing to investigate them for themselves.

2. It must be kept in mind that Buddhism is rather a system of philosophy than a creed, and whilst it has a priesthood remarkable for their learning and the strictness of their rules of living, it does not profess to set before its followers an object of worship, or encourage them to place reliance on such acts of religious observance as it permits, rather than requires from them. This renders it very difficult to institute a comparison between this religion and others which prevail amongst the various races of mankind, inasmuch as it enables the Buddhist priesthood to deny their responsibility for many of the errors into which their people have fallen. But if worship is (as surely we must consider it to be) the *expression* of our religion as our attitude towards the Deity, we must conclude that a creed stands self-condemned which fails to provide its followers with sufficient guidance in *this* the very *utterance* of the heart's impression in the most serious and solemn of all the ideas it can entertain. But I will give a brief description of the nature of the Buddhist belief, before I consider with you its claim to our attention as a system of moral teaching, based (or professing to be based) on certain opinions, with regard to man's existence and position in the world of which he forms a part.

3. The system, then, which we are considering is *Pantheistic*, *i.e.*, teaches that God is that universal existence or life which pervades everything—not a *person*—not creating and ruling—not therefore capable of exercising moral judgment; but simply—to employ again the same word, however unsatisfactory and vague—*pervading*. I do not think I need discuss this point at length, but I draw a distinction between this feature in Buddhism and another, which, in fact, is a necessary consequence—that it is *Atheistic*, that it denies the existence of God in all the attributes of Deity, with the exception, so far as it is worth anything, of this *universality*, or vague general presence without conscious life and being. Such a theory, of course, at once renders worship impossible. All that such a term implies, or that we signify by such an act, has no meaning if we may address no Being. The Buddhist, accordingly, does not worship, he “*contemplates*”; and so far as contemplation is an act or conscious operation, it is his sole occupation; it is in order to its performance that he discharges the rest of life's duties.

He practises self-denial even to austerity, performs his duties to other men, exercises even some virtues towards them—but these *not as* duties (for how can there be moral obligation when there is no moral governor ?), but as necessary in order to the attainment of a frame of mind favourable to what he has been taught to make his life's end and object—unruffled, inactive, *purposeless contemplation*. Such will be the character, then, of a Buddhist's life. Has he a hope of anything beyond life,—a *future* ? Here, too, we have to deal with the same difficulty, of a theory which is so vague and indefinite that we cannot thoroughly comprehend it for the purposes of criticism. We are obliged to reject it as insufficient and obscure ; but it escapes, from its very obscurity, some portion of our condemnation. The future of the Buddhist is *Nirwāna*—rest, but not conscious rest, *nothingness*, absence of life, the entire merging of the conscious self in the so-called universal existence ; not, it is contended, annihilation, but what else can it be called ? And if we hold that mere contemplation in life was an inadequate result for all our efforts to have won,—surely after death to have escaped consciousness is still more entirely *inadequate* as a result. I admit that in this brief description I am not putting before you the *practical* effect of Buddhist teaching on minds in general, but rather the theory as it is held and taught by priests. I admit, also, that they would have much to say in the defence of their teaching as to the actual moral precepts which their system lays down, but I argue that we require from a religion not only that it shall teach morality, but that such morality shall be based on some sufficient principle or motive. Such a basis the Christian has for his performance of duty in the very declaration, *God spake these words* ; and the entire character of his obedience is seen in the words of the Saviour—“ He that hath my commandments, and keepeth them, he it is that *loveth Me,*” &c. (St. John xiv. 21), whilst its performance is rendered possible in the precept, “ *Abide in Me, and I in you*” (St. John xv. 4) ; in other words, the Christian has not only precepts laid down, rules of life to observe, duties to discharge, but he is *given a motive*, he is promised a *power*. The Buddhist has to enter on his lifelong task without either motive or promise ; nay more, to the one there is the object of obedience, gratitude, love, *trust* ; to the other, *nothing*.

4. I need not do more than point out to you that I bring no charge against the priesthood of the very remarkable creed I am considering, of inconsistency in their lives or of conscious imposture in their teaching. I wish you to judge as favourably as possible, and as fairly as you can of their teaching, and its

results upon their people. I am not anxious to arm you with prejudices against the wonderful system we are examining, as if I were afraid that you might be induced to judge too leniently of its errors, or inclined to rate its points of excellence higher than those of our own faith. I can truly say that I have never felt myself so entirely satisfied with the absolute verity and truth of the gospel as when I could compare it with the best of all other religions, and after I had seen such religions *at their best*. It is nothing to be able to say that by the side of mere idolatry and corrupt superstitions the pure morality and reasonable belief which the gospel teaches shine out clear and bright as the sun in the firmament. I would rather you should compare these with the best possible system of morality and belief that can be found, and then draw your conclusion—which of all these is a revelation from God? which bears the impress of a Divine origin in all it requires you to believe or to do? And in bringing to your notice the Buddhist system, I am strongly of opinion that you will find nothing out of Christianity equal to it, still less *superior*. It may seem strange that I should say this of a religion which I have called *Atheistic*, and I will therefore at once give you my own idea of the character of that negation of Deity, which is the very root of the falsity of the entire system. You must, then, compare the Buddhist creed with that from which it sprang, and of which it was at first the *denial*—Brahminism. In this ancient religion, I need not tell you, a belief in God has a prominent place; it is, in fact, a belief in “Gods many,” in the numerous attributes or names under which it offers its homage to a Supreme Being; its chief corruption is the utterly carnal and evil form which the idea it presents of Deity has assumed. It imputes the worst passions and crimes to the Gods it professes to believe in and to honour. It is, in fact, a more philosophical form of mere Polytheism; but not one whit less corrupt than the Paganism which is familiar to us in the mythology of Greece and Rome, whilst the worship it offers is simply debasing,—the only exception to the terrible corruption of the entire system being at the two extremes, some of the highest priests who live wholly abstracted from life and contact with men, and the few of the simplest peasantry who, with a childlike belief in powers above themselves, offer prayer to a God they know not, but Who in His love hears them, and is not “far from” them. Such, happily, there may be found in every race, in every religion which can be called such; it is these first who, when Christianity is proclaimed, accept it with ready and eager assent, and form its

“firstfruits” in the countries; but these, alas! do not attain their piety in consequence but *in spite of* the fearfully corrupt and false traditions in which they have been trained passively to believe. Now it was to escape from such manifest superstition and degradations of belief itself that the founder of Buddhism propounded his comparatively pure system of teaching, denying the deities or forms of deity in successive incarnations which were accepted by the Hindu worshipper, as taught him by his priest, and figured to his sight in the representations on the walls of his temple. I have in my possession a faithful description, by one belonging to the country, of what Brahminism really is, showing what are the views of the Brahmins; but it is a description which I should not like to read to a meeting, so grossly impure are the things which they believe of their Gods. I ought also to mention that what I have said as to the founder of Buddhism endeavouring to escape from such superstitions is simply my own theory of the origin of Buddhism. I have no real historical authority for it, but it is my own explanation of the founder of Buddhism coming forth with the declaration that he did not believe in a God. God, he explained, is everywhere, in everything; but when he went further, denying *creation* or actual government as attributable to a living God, he erred, of course, and the error pervaded all the rest of his teaching. He taught a system of morality in itself very full of excellence; he prepared a body of priests who, living in absolute austerity, should be above the people whom they instructed, escape the corruptions which had disgraced the order in the vast majority of those with whom he had been familiar; and, for the worship which had but served them as an instrument of evil, he substituted what he would fain have thought a harmless abstraction—*isolation of thought*, to which in time was naturally added honour paid to himself. And thus you have the system as it exists at this day—a negative religion—a morality singularly incorrupt, though not free from error even in its ethical principles; and a priesthood, on the whole, very faithful to their traditions, and not without zeal for the teaching those traditions to their people; the first impetus, indeed, of the founder’s zeal sufficing to make them successful in obtaining extension scarcely inferior to that which they displaced, and soon, indeed, numbering millions of followers, as the quiet growth of assent went on in these Eastern minds; and even now, when Christianity has come into the field to dispute their supremacy, not easily or soon yielding before the yet higher precepts of moral teaching, and the far more reasonable require-

ment of duty and belief which Revelation has brought to man ; and, I must add, the very slowness to accept even this, giving a higher value to conviction when it comes, and making converts from Buddhism some of the most satisfactory of the fruits of our missionary labours. I remember speaking, only recently, with a gentleman of considerable experience in the East, and he gave me this information :—“ When I was amongst those who were converts from the Hindoos I rather avoided having converted Christians for my servants, but when I came to Ceylon I was glad to have them—I found they were so much more honest and trustworthy.” I was much struck with that statement, coming, as it did, from a gentleman who, of the two, was rather prejudiced against our missionary labours, and not inclined to give too favourable an account of them.

5. But I must show you more in detail the actual *weakness* of the system of which I speak so highly.

1. It has no belief *in God* for its foundation.
2. It has no *worship*, strictly speaking, to offer to its adherents as the *expression* of such a belief.
3. Its morality is based on a false principle of *merit* as well as in itself abounding in fictitious and *invented* duties.
4. It has no *future*, beyond a few vague fears of possible suffering in a subsequent life, to escape from which is its highest good.

(1.) It has *no God*. I have already shown you that Pantheism, from its very indefiniteness, does not convey the idea of God in the sense in which men use the term, or conceive the idea of a Supreme Being; an idea, you must observe, which is *universal*, or existing in some form in every known race, the supposed exceptions always, after sufficient inquiry, being found to fall under the common rule. The practical Atheism into which the system of Buddha subsided is really the inevitable result of this inability in Pantheism to supply the *want* which man feels, or to meet his innate sense of trust in a higher Power to which he can appeal. It was to escape from the contradictions of what was practically *Polytheism* that the Buddhist founder invented this substitute, to guard which, as he thought, he denied creation and moral supremacy, as the channels through which the worship he wished to uproot might reappear. But Atheism is the necessary consequence of such a denial, as its inevitable result and condition, and accordingly, whether accepting the term or no, the Buddhist teachers are atheistic, and in this fearful error lies the weakness of their entire system. Their worship is a contradiction of their theory of belief, instead

of its expression ; their morality is impossible because baseless, and without an object to whom their responsibility can be referred, and—to us, regarding it as Christians—also impossible, since grace is neither sought nor attainable. I have not said one word of another unquestionable truth and indispensable need in man—the existence of sin and the need of forgiveness, to us brought home in the two precious words *repentance* and *pardon*. I rest here my objection on the one ground of faith being impossible under such a system, with all it implies of *hope*, and *reliance*, and *prayer*. The marvellous questioning of St. Paul (Rom. x. 13, 14) is so directly applicable to what I am saying, that I will conclude with it this head of my argument, “*who-soever shall call upon the name of the Lord shall be saved. How then shall they call on Him in whom they have not believed? and how shall they believe in Him of whom they have not HEARD.*” It is to this mournful silence of Buddhism on that great want of man that I would for a moment direct your attention.

(2.) I now pass on to consider the Buddhist religion as wanting in *worship*. You may be surprised that I should say this when you know of ancient temples existing, some of them the very oldest in the world, as known and traced in records of the past ; and the *priesthood*, you may ask, what are their functions, if not to conduct the people’s *worship*? I have been in one of those very ancient temples, and I believe I saw there the oldest tree in the world, of which there is any historical record. The old temple was built about the tree, and some of the branches were supported by the brickwork. That tree has existed there for centuries, and it is likely to exist, I might almost say, for centuries more. Enter, then, with me into one of these temples, and your wonder at my assertion will increase, for you will see images, representations of the great Buddha in all of them; in some, numerous and of various size and posture, and, above all, one *gigantic* and commanding—a recumbent figure, with eyes closed as in sleep,—surely, you will say, the idol which is worshipped by those who enter; and when you look, there is something strangely imposing in the deep quietude and repose that reign around. In speaking of the various postures of these figures I may mention one curious fact which I remember pointing out to the priests in one of the temples, and that is, that there is one posture which Buddha is never made to assume, namely, that of kneeling, or the attitude of prayer. The silent priest at your side makes no sign, but looks at you with fixed gaze, as wondering what your thoughts must be; and though there is no

perfection of art in the figure itself, it is in keeping with all that surrounds it—the quaint, rude architecture; the flowers, most of them faded, which have been laid as offerings at the feet; the dim light burning. Yet, if you ask the priest if he worships the figure at which you have been gazing, he will indignantly deny the charge. I do not, indeed, think that the denial is so satisfactory as it is on his part sincere, for it is doubtless true that he does not pray to it. What I do think is that the sort of devotion or frame of mind which such external objects excite is one of the dangers of all corruptions of true worship, which Buddhism has not escaped, just as in Christianity itself, without imputing idolatry to our brethren, we cannot fail to observe an idolatrous tendency as the result of encouraging the use of external objects to excite reverence, or to assist worship by producing a frame of mind consonant with worship. In like manner, the figures of Buddha do, in my opinion, suggest something of a practical idolatry which the system itself denies. I have, however, another and more definite charge to bring against it under this head of worship. We will then leave the temple as we entered it; and on leaving we observe a few people coming and going; each has brought or is leaving a flower and small coin, and a few outside may be observed repeating some words in devotional attitude; they are, if not praying, at least engaged in devotion of some kind; but the *priest* does not notice them either in the way of approval or hindrance. Besides the temples there are certain large buildings without any grace—more like the pyramids of Egypt, except that they are of smaller dimensions—and the worship of the people, so far as I have seen it, is more frequent outside, around the *dagoba*, as these places are called, than in the temple itself. The *system* is not one of worship; but *men will* worship, and if they are taught there is no God, they will still “feel after Him, if haply they might find Him.” It is man’s *nature*—and in the higher and truer sense of the word—to *believe in God*; and in the same sense the poet’s reflection is true:—

“Naturam expellas furcâ, tamen usque recurret.”

I wish I could stop at this point, and add nothing darker to the picture I have drawn, but we must follow the last comers; and not far from us there is another temple—Deywalla, or *Devil Temple*,—into which we cannot enter: and there is the result of this prohibition of prayer, even if it were successful—those who may not pray to a God of mercy and goodness will offer their vain devotion to *evil powers*; if they may not ask for

blessing, they will deprecate curses and malice of cruel demons ; and though the Buddhist priest does not acknowledge, he does not *forbid* the impious rite. He cannot, however, escape responsibility for that which is the natural consequence of his system of teaching, and its fatal denial of the existence of God.

(3.) But is the morality of this creed so perfect as, after all, to raise it, if not to an equality, yet to a point of fair comparison with that of the Christian? I shall not enter into details, but I will take care that Buddhism shall not suffer for my brevity. I will admit that the leading virtues are taught, and most of the sins which debase our nature in effect forbidden ; that, in fact, our own ten commandments are found to be the basis of morality as between man and man, if, as we should expect, the duty we owe to God is omitted. The error, however, arises at this very point. To whom, if not to God, are we responsible for moral duties *at all*? The Buddhist is not, indeed, without a reply ; but is it a sufficient reply? He bids us perform good deeds and avoid evil actions—the former for *merit*, the latter under fear of a future loss ;—the one to advance us towards the state of *Nirwāna*, the latter as bringing the consequence of a continued existence, and that, it may be, in the lower form of some *animal*. I do not stop to argue the point, how can there be *merit* where there is no standard of excellence, no judge or rewarder of goodness, I will simply say that, allowing it to be possible to inculcate the practice of virtue on such a ground, *very few* will accept the teaching ; it will not meet the difficulty which besets every man—his *temptations*, his natural inclinations to evil, or his very *inertness* and love of ease. The actual result is that a few do perform good actions, generally such as meet with a present reward of outward respect, and almost all perform some supposed duties, too often such as have no intrinsic goodness, such, for instance, as saving the life of animals, often under circumstances where it might be preferable to act otherwise, as the killing of noxious creatures dangerous to the life of man. I have pointed out to the people themselves how sad it was that, while that was the case, it never occurred to them that it must also be a duty to make the lives of animals happier whilst they existed. I have seen them very cruel indeed to a lame and disabled dog. They would not kill it, but they made its life very intolerable, to say the least of it. I do not enter upon the question of the performance of ordinary duties, or even the practice of the quiet virtue of kindness, obedience to parents, love of children and the like, for the truth is, the nation I am speaking of in these remarks is by no means deficient in these respects. If I *could* I would

gladly connect it with their religion that they possess these natural virtues; but, on the other hand, I cannot deny that they are very deficient in truthfulness and honesty,—that they are covetous to a strong extent, and revengeful;—but I am not desirous of giving a catalogue of their faults. The defect in their morality is this—they are the *slaves* of the impulse of the hour. As they are not taught to resist wrong as wrong, and to do right because it is right and as responsible to a Being of infinite power, wisdom, and goodness, they yield, each of them, almost without a struggle to their besetting temptation, and great crimes are committed, not, as with us, either by those who love better things, after a struggle and under strong temptation, or by the wilfully depraved who know what they are doing—but by what we might call good and bad alike, without distinction, and almost without *compunction*. That is the great peculiarity of Buddhism: evil deeds are committed by Buddhists whom we should otherwise consider very good men. If they were tempted, they would, without the least compunction, commit the grossest crimes. It is possible, of course, in a Christian country to have such cases, but there they are common. They never seem to have the least idea of resisting a temptation, and I do not think I am uncharitable in saying this. I have lived in the midst of them for a long time, and I have always recognized most gladly all that was good amongst them.

(4.) I now pass to that which I will place last in my sad enumeration of the shortcomings of Buddhism,—its having *no future*, no prospect of a bright *eternity*, no love of a Father who will be then present with us, giving us that which at this season we pray for, “the *fruition* of His glorious Godhead.” But I must not assert that Buddhism in theory presents no future to its followers. It tells them very plainly that death may not be the *end*—that they may find existence still clinging to them after they have laid down the life they now live; nay, that there is an alternative of good or evil. But what are these? Punishment in the one case—the life of a brute, it may be, they will have to experience, if they have failed in the requirements of that strangely inconsistent religion in which they have had no consolation, and can have felt no joy. The punishment, so far as it is such, I have mentioned. The *reward* I also alluded to earlier in my remarks: it is to *cease to exist*—consciously and individually to be lost for ever in the great universal life, absorbed in that which, pervading all things, is to our conception nowhere. I will not say that I can lay before you in adequate terms this strange theory of a

future state. If you can form some conception of it which brings it to your minds in a more tangible shape, I shall be glad that you should do so, for I have no wish to do aught but full justice to the system I am attempting to describe. But what I can say without doubt is this: that the prospect of Nirwana does not influence with *hope* one in a hundred—I might say a thousand—of those amongst whom I have lived, and continually sought to ascertain with what hope they were living, or yet more, *dying*, when death came, as it comes to all of us in turn. The most striking proof I will adduce is this: when death approaches, in some of its exterior signs of approach, the sufferer turns to his friends, and often to the priest for *what*—for *consolation*? Alas! no; for some chance of prolonging life, some charm to stay the disease, or keep the evil spirit who is inflicting it at a distance—it may be for a little space—and that is all; and after death they mourn for the dead, not only without hope, but in fear and trembling. The bird of the air whose voice they hear, the animal that passes by them in the gloom, these may, any of them, be the lost one revisiting in sadness the scenes he has left. Very few, indeed, can die and leave behind them actual hope of even that dim and uncertain future of rest being attained. So time, and time alone, does its work of a partial consolation, and the dead are forgotten, and the survivors live on with no higher motive to incite them to good or to deter them from evil. Such is the system of Buddhism of which, a few weeks ago, one who knows the theory from books, spoke as if it might vie with our own Christianity in excellence. If he had lived amongst its followers as I have done—if he had observed the way in which a national religion shows its effects upon a people, *i. e.* in making better those who follow *it the most sincerely*—he would have, I venture to say, come to a very different conclusion from that to which he seems to have come; and certainly, if he had known the priests of this religion, as I have done, in friendly intercourse and quiet converse, and heard them calmly express their indifference as to the wider extension of their principles, or the success of Christianity itself as a possible event, he would not have ventured to say of Buddhism that it was a missionary religion, seeking to propagate itself by extension, like ours—which bids us “go into all the world, and preach the Gospel to every creature.”

Before I conclude, I should like to refer for a moment to a letter which has been received from a distinguished person,—Professor Chandler, of Oxford—who, having read a proof copy of my paper, very kindly and properly offers his comments

upon it, and to those comments which are not altogether favourable, I should wish to do entire justice. He accuses me—I do not say “accuses” in any unkind sense, but he thinks that I have fallen into, a contradiction on one point. He thinks that in what I say as to the fault of the Buddhists, that they are not taught to do right as right and to avoid wrong as wrong, I am inconsistent, since, on my own showing, right is only right because it is taught us by a higher power—God Himself. But he fails to observe this, that right being right in itself, and being also the will of God, appear to us identical terms. Certainly I should quite allow, what Professor Chandler lays down as a belief, that there is in man—theist, pantheist, atheist, or Christian—an innate sense of right and wrong, and I take that to be, just as I take the sun in the firmament to be, one of the marvellous proofs of the existence of God. I argue from it that there must be One to whom right is His natural law. He is our moral governor, and we, being His creatures, He has implanted in us that innate sense. Professor Chandler says, further, that Christianity would suffer if we were to judge of it in the same way that I judge of these Buddhists when I speak of all their natural virtues, not as emanating from their religion, but as being what I have called them, merely natural virtues. Now I really think that I am not guilty of any such injustice as to fail to impute any point of excellence to Buddhists which comes out of their religion. They are very careful in the performance of certain duties, or what they consider such. The life of a priest, for instance, is a life of mendicancy, self-denial, and austerity, and they carry it out because they are taught to do it, not that I believe it is the best moral state, or that there is any virtue at all in mendicancy. As to natural virtues, I had many conversations with the Buddhist priests, and I always allowed to them that there was by no means a want of many of these natural virtues among the Cingalese people; but I maintain that a religion, if it be worth anything, is not to count as the result of its own efforts what are called the natural virtues. As Christian ministers we do not claim to have produced the natural virtues. All men we say have natural virtues which are the gift of God, and we tell them to make those natural virtues into Christian good works by dealing with them in a better or truer spirit, such as not claiming merit, but rather adding to them humility. In that way they assume a different character in a Christian man. I once said to a Buddhist priest: “I do not blame your religion for all the vices I see among you, nor do I impute to it all the good I see, but I want to ask you how do you deal

with vices? What effect has your teaching on the bad people?" His reply was: "We have nothing to do with them at all. No religion can deal with the bad: it is only the good we have to deal with. The bad must be left to themselves." "But," I said, "I must differ from you altogether. It is the bad people that we always go to first and try to deal with, and if our religion did not make bad people into good ones, I would give it up." The priest replied, "If that is the case, I think your religion is a very superior religion," and he did not say it contemptuously, though I do not think he was very credulous about the matter. I have seen people who seemed utterly lost in hopeless depravity—I am not speaking of England but of what we mean by Christian countries—and by getting them to go in prayer to God and ask for grace, I have seen them entirely changed. I have seen drunkards reclaimed, and people who were leading dissolute lives become good and holy. I have seen it among Christians and in converted heathens, and I can have no doubt, so long as I live, of the power of the Gospel to turn sinners into very saints of God. (Cheers.)

The CHAIRMAN.—I think I shall be expressing the thoughts of every one present, when I say that we are deeply indebted to the right rev. prelate for his kindness in coming here, and giving us so valuable a paper. (Cheers.) I cannot forbear making a remark upon one excellent feature in that paper—namely, its perfectly unprejudiced character. It would have been pardonable for a Christian bishop living among heathenism, to have dilated much on the faults of the system he had seen, and on the excellences of the system of which he is so able a preacher. But Bishop Cloughton has not done so. He has come to us, a scientific and not a religious society, and has most philosophically pointed out where the Buddhist system fails, and has then compared with those points the particular characteristics in which the Christian religion is eminently excellent. Some communications have to be read, after which it will be open for any one to offer remarks upon the paper.

The HONORARY SECRETARY then read a letter from Professor Max Müller, in which he expressed his regret at being unable to be present, mentioned that he had read the proof copy of Bishop P. C. Cloughton's paper, and added, "I do not think we differ much in our estimate of Buddhism. He naturally dwells on its dark, I on its bright side; he judges of it by what he has seen of it in Ceylon, I from its own sacred books." Also the following from Professor Chandler:—

"Pembroke College, Oxford, Jan. 15, 1874.

"DEAR SIR,—Allow me to thank you for the kind invitation you have sent me to attend a meeting for the discussion of Buddhism on Monday night. I regret that I cannot come to London, for in Buddhism, as the

creed, or every-day system of the majority\* of mankind, I take a great interest, and I would very willingly know more than I do of its practical working. It seems to me that if the bishop (whose fairness I much admire) were to treat us English as he does the Singalese Buddhists—were he, that is, to subtract all of our practice which springs simply and solely from the ‘natural virtues’ of our race—we should hardly be in any better position than the Buddhists, perhaps we should show (all things considered) to considerable disadvantage. In page 146 of his paper he seems to me to fall into something like a contradiction. Near the top of the page he implies (if I do not misapprehend him) that if there were no God there could be no moral duties, nothing that a man *ought* to do. At page 147, he complains that these poor Buddhists have never been taught to do ‘right because it was right.’ This seems to me inconsistent, and—if it be a true exposition of Christianity—to reduce our morals and religion to that purely utilitarian system which Mr. J. S. Mill maintains it is,—I, for one, believe with all my heart and soul that even on the hypothesis of atheism (or the nearest approach to it that an honest man can muddle himself into), 1. That there are distinct moral *duties*; 2. That men have, do, and always will acknowledge the existence and obligation of such duties; and 3. That they have, do, and will approve of all who practise such duties, and will themselves practise them, more and more in proportion as such duties are set before them simply as duties, plain to all rational men, incumbent on all rational men, and not as something which derives all or any of its binding force from present comfort and security, or future happiness in heaven. Religion—rational religion, that is,—so far from being the basis of morals either speculatively or practically, seems to me to be the consequence of that feeling or sense (call it what you will) of right and wrong which all but babies and a few philosophers possess in some degree or other. There seems to me nothing more likely to bring Christianity into contempt with reasonable people than the proof (if proof there could be) that it makes all moral duties depend on the arbitrary will of God. My only wonder is that, after so many years, centuries of pulpit utilitarianism, Englishmen retain even any rays of virtue at all. If Buddhism does teach that there may be—must be right and wrong, even though there be no God—then I no longer wonder at its influence. It is a strong thing to say, but it is, I believe, true, that we are all of us far more certain that there is a binding right, a repellent wrong, than we are that there is a God, and that, had man no distinct sense of right and wrong to begin with, he would never have dreamed of a God, or would have soon awoken from it. So you see it is from no want of interest that I shall be absent. I cannot come, having all sorts of things to do.

“Believe me (in great haste), very truly yours,

“H. W. CHANDLER.”

“Capt. F. Petric, Hon. Sec.”

\* The population of the globe with reference to religious worship, has been estimated as follows:—

	Balbi.		Dieterici.
Jews .....	4½ millions.	.....	5 millions.
Christians .....	389    ”	.....	510    ”
Mahometans .....	155    ”	.....	160    ”
Idolaters .....	665½   ”	.....	800    ”

Among these last Balbi estimates the Brahmins at 60 and the Buddhists at 170 millions, which is considered an under-estimate.—ED.

Also the following from Professor J. S. Brewer :—

“ King’s College, London, 17th Jan., 1874.

“ DEAR SIR,—Will you be good enough to thank your Council for their kindness in sending me a proof copy of Bishop Claughton’s valuable paper on Buddhism, and their invitation to be present at its discussion. I have been suffering from so severe an attack of bronchitis that I am afraid to venture out in the evening, and therefore I cannot avail myself of the pleasure they propose. I regret this the more, as I think the subject of Bishop Claughton’s paper of the highest importance, especially just now, when Christianity is covertly and openly attacked on all sides, and Pantheism, hitherto a philosophical notion and vague theory confined to the speculative, is now supposed to have assumed in Buddhism a practical shape, to be a formidable rival to Christianity itself, and to have undermined the evidences on which the latter rests. A clear statement of what it is, and its results on the faith and conduct of those who embrace it, by one who, like Bishop Claughton, has had opportunities of seeing it with his own eyes and not deriving his information from books, is, just now, of the utmost importance : for I happen to know cases, in my own personal experience, where the exaggerated notions of Buddhism have tended to shake men’s confidence in Christianity and its *Divine* original. The Victoria Institute has on this, as on other subjects, done useful service by obtaining so much valuable information from one who is so well qualified to give it. But I hope Bishop Claughton may be induced to treat the subject more fully, and draw out the contrast between Christianity and this, its supposed rival, more minutely still. He cannot do a greater service at this time to that Church of which he is so distinguished an ornament. I wish this and some other papers of your Institute could be distributed among the clergy, at a small price, for many of them are really ‘Tracts for the Times,’ and handle questions of very great importance for the clergy to be well acquainted with. I say ‘a small price,’ because the clergy have many books to buy, and, for the most part, little money to buy them with.

“ Yours truly,  
“ J. S. BREWER.”

The Rev. H. WACE.—With regard to Professor Chandler’s letter, I am sure that any observations on this subject from the successor of Dean Mansel, who we all know was so distinguished in Christian apologetics, deserve the deepest consideration, from the great interest he takes in the controversy, and from the fact that he has read most profoundly on all these matters.

Bishop CLAUGHTON.—Of course his last remarks I entirely and totally differ from. I take the sense of right and wrong to be one of the strongest and most unanswerable arguments to prove that there is a God or moral governor. He has put that sense of right and wrong in us, and that is why we praise good and blame evil.

The Rev. J. SINCLAIR.—There is one point on which I should like to have a somewhat more distinct statement from the right rev. bishop, and that is as to the actual state of morality among the Buddhist community as compared with our own country—with reference, for instance, to stealing and drunkenness, and such other common vices.

Bishop CLAUGHTON.—I do beg that you will consider that I do not wish to represent them as at all worse than they are. There is a great deal of

dishonesty, and want of truthfulness to a fearful extent ; there is also a want of purity of thought and word, as well as of deed, which is fearfully common.

**Mr. SINCLAIR.**—As compared with England ?

**Bishop CLAUGHTON.**—Yes, as compared with England. Do not suppose I do not know that there is a vast amount of evil of that kind in England ; but on these points, I must confess, the amount of evil in Ceylon is terrible. In our own country, no sensible parents will allow their children to be too much with their servants, it is not desirable ; but there it is not simply a matter of caution but a matter of absolute necessity, for otherwise the most improper things are placed before them. But, on the other hand, there is nothing in the religion of these people to teach them differently. In our schools and pulpits here we teach certain morals to old and young, rich and poor, but there there is nothing of the kind. It is true there are certain lessons from the sacred books read out, but few of them contain moral precepts ; they consist rather of telling the people to commit particular things to heart, but they do not answer to our moral teaching at all. But the great comparison that I would make is this : here there are bad men and good men, and sometimes what are called good men are tempted to evil and lapse into badness. There, if a man who is naturally a good, kind-hearted man, and not at all cruel, happen to have the besetting sin of covetousness—which is common enough among all these races, not the Bhuddists in particular—and somebody interferes with his interests, he thinks no more of putting the man out of life than you would think of killing a noxious animal, even if the person he has to deal with be his friend, his relation, even his father. With us, if an infant dies under suspicious circumstances there is a coroner's inquest ; but they cannot understand that human life is so sacred, the very notion is a wonder to them. It is not that they are worse than we as natural men, but things that would horrify us, with all our faults, they are not surprised at. But it is not a part of my argument to make a comparison of this kind, in reference to a people from whom I received much kindness, and to whom I have owed my life. I do not like to stand forth as their accuser, but if you ask me honestly, there is no comparison at all between them and our own people, with all our faults and badness. I should like to say that when I was in Ceylon I was always on the side of those who were the advocates of the native race, and if there was anything that excited my own indignation it was when Englishmen expressed themselves unkindly or harshly of the people among whom they were living ; and the very things we blamed in them were partly our own fault. If you dealt with them like children, or as Dr. Arnold dealt with his boys, and said, "I will trust you," you could teach them anything, if they were not lost to begin with. I do not believe my servants ever robbed me, and I could trust them thoroughly, but I taught them first by showing and telling them that I trusted them. But I want to say again that I wish it to be considered that in anything I have said against these people I am an unwilling witness. I do not wish to bring anything against them,

for I fully and thankfully acknowledge that there is a great deal of good in them. I have received a great deal of kindness from them, and I should be really sorry to think that I had stood before a Christian meeting as their accuser. I will say that there is no class of converts with whom I have had to deal—and I have had a great deal to do with that happiest of all works, the work of a missionary—there is no class of converts whom I have found so valuable as those from Buddhism, which is, I think, a great testimony to Buddhism itself. I have had the happiness and privilege of ordaining some twenty of the natives of Ceylon, and, out of those twenty, I assure you that not more than two ever disappointed me, and those disappointed me not by becoming anything scandalous or vile, but by becoming indolent, and puffed up with the idea that they were admitted to something higher than they had been before. I could declare, when I left that island, that there were converts working in that mission there who were as faithful ministers of Jesus Christ as I ever knew in my life.

The Rev. C. A. Row.—I want to get an additional amount of information on the question of Buddhism, which is a very practical one. I am not unfrequently called upon to deal with it in Bradlaugh's Hall of Science, where I am told that the morality of Buddhism will bear comparison with that of Christianity. There is also a very wide-spread belief among these unbelievers that the story of Jesus Christ is actually borrowed from the Hindoo story of Krishna,\*—one of the most surprising things which can be asserted by rational men. I should like to hear Bishop Claughton's opinion as to the real difference between Pantheism as taught in Strauss's recent work, and as taught in the leading precepts of Buddha; and also his opinion as to the value of Sir John Bowering's work on Ceylon, which treats largely of Buddhism. The bishop, no doubt, has also read another book—the travels of the Abbé Huc in Tartary,—and I should like to ask him whether that work faithfully depicts the theology as well as the practice of Buddhism in the countries which it describes. There is nothing that we want more than an English book to which we can appeal, in reference to the origin and character of Buddhism, with as much confidence as we can to Sir George Cornewall Lewis's work on the credibility of Roman history. I own that I am ignorant of the real historical value of the common views which are popularly placed before the public on the subject. I want to know the values of the authorities on which the original history of Buddha professes to rest, and whether they rest on an historical foundation. I know that the authorities are not contemporary, but I wish to know whether there is any reason for believing that the real history of Buddha has been handed down by a faithful tradition during the centuries that it remained unwritten. I am not acquainted with any work in England which thoroughly investigates

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\* Mr. W. R. Cooper, of the Society of Biblical Archæology, has drawn my attention to Mr. Hardy's statement in his "Manual of Buddhism," that recent investigations point to the fact that certain travesties of the Christian religion first appeared as a part of the Buddhist faith in the second century of the Christian era.—ED.

this important question. I will now offer a few observations on the subject itself. First of all, it seems to me that the principles of Pantheism, so far as their moral value is concerned, are plainly undistinguishable from those of Atheism. Both are equally wanting in moral power capable of influencing mankind. This is deeply impressed upon me by Strauss's late work. So far as any moral obligation, derived from any external source, is concerned, that work thoroughly saps it to the foundation. I do not deny that there is an internal sense of right and wrong in the human mind, whether a man be atheist, pantheist, or theist, and I think that the existence of this is one of the proofs upon which Theism rests. No doubt rules of correct morality are important, but the all-important point is, by what moral force can we put those moral precepts into execution. We may go to the ancient philosophers of Greece, and find in the long run a pure set of moral precepts, but they themselves most fully confess their positive and absolute powerlessness to make those precepts become actualities. No man has read the Ethics of Aristotle without feeling most deeply the powerlessness of that philosophy. The philosopher investigates the foundation of morals, but he feels himself absolutely powerless when dealing with human passions. "Do this thing because it is morally beautiful: do not do that thing because it is the contrary"; but all these precepts are mere chaff before the violence of human passions. This is the essential difficulty to be urged against the morality of Buddhism, that, denying as it does any external obligation or any external power which can be brought to bear on the moral nature of man, it leaves him helplessly irreformable. This is exemplified in the morality taught by Strauss. Read his book carefully through, and you will find that he is entirely without any possible moral power to bring to bear on the human mind. I am not much concerned when I am told that there are many sound moral precepts to be found in Buddhism. This is unquestionably the case in the philosophy of utilitarianism as taught by Mill. The highest point to which he can come is that one is bound to act for the greatest happiness of the greatest number; but how is this to be enforced? Christianity asserts that it possesses such a power as we want, and concentrates it in Our Lord's person, not a mere system of moral precepts which rest upon no distinctive moral power to enforce them. The right rev. bishop has brought out the fact that Buddhism has no real future for man. I apprehend that Buddhism is in this point of view superior to modern atheism and pantheism. According to Strauss, when death takes place there is nothing hereafter—we are absorbed at once into the infinite universe. The evil and the good alike will sleep the sleep of unconsciousness. It is quite obvious that, supposing the moral teaching of atheism and pantheism to be good, Christianity must have a great additional moral power when it is able to enforce moral obligation by the prospect of a future state and a future judge. We Christians have this advantage over our opponents: we have all the principles which they can bring to bear upon us, and we have others in addition. The principles of Buddhism must be preferable to those of Strauss, because Buddhism teaches that if a man lives a wretched life, instead of sinking

into unconsciousness, he must go through a set of transmigrations. This is a moral force which the system of Strauss is positively wanting in, for he teaches us that it is exactly the same with the evil and the good—that the greatest villain and the best of all men meet with the same end, a painless and everlasting sleep. I wish to add one further observation. I apprehend that Max Müller, in his recent work, did not intend to assert that Buddhism, *as it now exists*, is a Missionary religion; but that it was so in its origin, and in the original impulse through which it spread; in one word, that there are three religions only in the world, which can claim the character of Missionary ones, Christianity, Mahomedanism, and Buddhism; these have been propagated mainly by persuasion and preaching—the two former, the second especially, having been aided by the sword: these three religions have spread from a well-known historical beginning in a single person, until they have embraced millions of our race.—This is what I apprehend Max Müller intended in saying that Buddhism is a Missionary religion. To affirm that it is so at the present moment, no one would do who has the smallest regard for facts. But it is an equally patent fact, that it was so at its first commencement, and until it had spread over a third of our race. The Greek Church is a Church from which the Missionary spirit is gone. A person who knew only of this Church, might affirm that Christianity was not a Missionary religion. The fact that the whole life and Missionary spirit of Buddhism has passed away, by no means hinders that at its commencement it was one of the great Missionary religions of the earth. Buddhism, though now effete, was Missionary in its origin, and in the conditions of its first existence; and on this account took rank with the Christians and Mahomedans, which together with it, formed the only three religions of mankind which have been animated by a Missionary spirit.

The Rev. W. J. IRONS, D.D.—I rise to say very little indeed on this subject, because I am aware how little is yet known, and have taken pains to ascertain as much as is yet knowable by an Englishman who cannot read Sanskrit. I have not the advantage which Bishop Claughton has had of living among these people, and therefore I am anxious to hear from him more than he has yet brought before us this evening. Probably, in his lordship's concluding observations, when he comes to reply, he will enlighten us somewhat further. We want to learn how, practically, to deal with this great system of Buddhism, which is the religion of so large a part of the human race, submitted, by a mysterious providence, to the government of this country. We have to govern the believers in Buddhism and the Brahminism out of which Buddhism sprang. We have great duties towards them, and we have very few sources open to us as Englishmen which will help us to understand those duties. There is an excellent work by Mr. Spence Hardy on "Eastern Monachism," which I read some fifteen years ago. Mr. Hardy was a Nonconformist missionary, and his book gave me a clearer idea of the Buddhist system, as a whole, than I should have obtained from any other source. Professor Max Müller's books are too mysterious, vague, and unhistorical to satisfy me. I have read them with attention, but I got very little

out of them : it is better to speak the plain truth on a subject where there is a great deal of unreality. There is a capital book which goes into the subject in some detail, and compares Christianity with Hindooism in many of its phases in a very forcible way ; its title is " Parameswara Inyana Goshthi," and it is a series of discussions put out by the late Mr. Rowland Williams, one of the celebrated " Essayists,"—a man gravely misunderstood in his time, and who certainly has left behind him a reputation which will survive. I say this, of course, without at all endorsing his opinions. His book will give, to any one who desires it, a tolerably clear view of the subject, or that which more nearly approaches to a clear view than anything else which, as far as I know, exists at present in the English language. I could not recommend any one who wishes to have a usable outline of the subject to rest in the translations of the " Hymns of the Vedas," by Professor Max Müller ; nor in his book on " Science and Religion " ; and yet the question which Professor Max Müller could answer better than most men, and which I should like to hear Bishop Claughton speak about, is, what is the historical value of the Vedas ? As to the Shasters, I suppose there is no historical value in them, and I doubt very much whether there is any in the Vedas. Their antiquity is most difficult to ascertain. I greatly doubt whether we can find earlier than, say the Macedonian conquest of Persia, any worthy historical basis for the Vedas ; and it seems rather gratuitous to call upon Christian people to compare these writings with the venerable writings of Moses and the prophets. The sublimity and the grandeur of our ancient Hebrew books have been felt by millions from the time of Isaiah and Moses ; while these Vedas are brought forward but yesterday, and but for the efforts of our own countrymen, they would have remained, in all probability, unknown to the rest of the world to this day. So great is the contrast between the two sets of books—the Jewish and the Indian—that one can only be surprised at the remarkable mental constitution which can regard them for a single instant as in any sense parallel books of religion—parallel authorities in divine truth. That they have indeed been spoken of as in some degree parallel we all of us know, but the fact that they have been so mentioned will, I venture to say, be hereafter regarded as a curiosity in the history of the human mind. But we are concerned, no doubt, with another question closely connected with this which I am glancing at, namely, what is the historical importance of the Vedas in connection with the languages of the world's ancient races. I believe it is admitted that languages were so imperfect in primitive ages as not to have been able to give utterance at all to the higher ideas of theology and morals ; and yet they somehow reached the wonderful perfection of Sanskrit, and found expression in it, in pre-historic times, and attained a metaphysical perfection so great that there is no kind of controversy among Christians to which you may not find some parallel in that ancient literature of India. Here surely is a wonderful subject for the investigation of our *savans* ; they should aim to explain to us how that extraordinary civilization had arisen. We cannot indeed find the history, but we ought at least, one would think, to have a theory founded upon some

evidence. Now, I do not think the theories shadowed out by Max Müller are much better than those of Jacob Bryant. They appear to me to be vague and obscure in the highest degree, and the fact remains, and has to be grappled with, that here is a high and ancient civilization the origin of which is entirely unknown—unknown, I mean, to us : let those who can find out anything about it, tells us.\* Until we know something of the origin of these Vedas, we shall not be able to make anything like a “science of religion” in the sense of Professor Max Müller. In our actual dealings with Buddhism, we have to take a series of wonderful leaps through very dark centuries, and then come suddenly at last into the blaze of finished speculations which would have appalled Kant. I cannot bridge over the gulf which separates the religion as now existing from the religion as it must have existed some 600, or even 300, years before Christ. That is a matter on which I should be glad if to-night we could have the opinion of Bishop Claughton. Sooner or later, certainly we shall have to deal with this subject in a practical way. The visit of Chunder Sen to this country a year or two ago brought us in close contact with the last development of the Indian mind. His disciples are now forming a religion which is called Brahmoism, in which they regard Christ as a moral teacher, just as they would Brahma as another moral teacher. They are endeavouring to form a sort of religion in some sense apart from Christianity, and I understand they have had a success larger than that given to some of our missionaries. The Brahmo theory is intelligible certainly to those who carefully study it ; but the theory put before us in “Science of Religion” within the last few years does not seem to be even intelligible, though some of us have tried earnestly to master it. There are many who do know Sanskrit, and some who speak with an air of authority ; and they ought to tell us the theories they deduce from their facts, and examine the origin of that Indian system of religious philosophy, the working of which we are now seeing, and the condition of which we are obliged to deal with. The Archbishop of Canterbury said not long ago, that if we do not undertake in real earnest the conversion of these heathen to Christ, there are some among them who will soon undertake the conversion of some of us to heathenism. We had therefore better grapple with the subject in time, and I would now ask your lordship to enlighten us further upon it. (Cheers.)

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\* We are reminded by these remarks of the discoveries of Dr. Schliemann at the hill of Hassarlik : a shaft pierced five strata—each considered as indicating the presence of different peoples :—The first, 6 feet thick, “was that of the later Ilium” ; the second, of 7 feet, indicated a people living in wooden houses, and using bronze implements ; the third, 10 feet thick, people using flint implements, such as are now referred to the stone age ; the fourth a very thick layer, showed a people in an advanced stage of civilization, living in houses built of unbaked bricks ; the fifth, at a depth of 46 feet, was 6 feet thick, indicated a people living in hewn stone houses and using pottery of superior quality, and of much elegance of form.—Ed.

Mr. GIBSON.—There is just one question which I wish to ask the Bishop, and that is whether he was struck in any way by the missionary spirit or operations of the Buddhists. He is quite aware that a very strong statement has been made by Professor Max Müller, placing Buddhism on a par with Christianity in regard to its missionary machinery. I should like to know whether Bishop Claughton saw any exhibition of that machinery. A very bold statement has been made, and I must say that I am a little doubtful concerning its correctness, and I do not know any one better able to answer the question than Bishop Claughton.

Dr. IRONS.—May I be permitted to say that the passage in the paper which has been commented on by Professor Chandler, happens to be a passage which I myself marked as it was read in the sense of Professor Chandler, and not in the sense of Bishop Claughton.

Mr. WACE.—I am happy to hear that observation from Dr. Irons. Professor Chandler's remarks seem to me to touch so closely our interest in this question, that I should like to draw more attention to them. The question that interests us is not, I think, principally that of the relative excellences of Christianity and of Buddhism. That is, indeed, out of the question in this room; for it is a foregone conclusion, and I do not think it can be otherwise even with those to whom Mr. Row has referred. What we want to understand is, how we are to deal with this extraordinary manifestation of human nature which we call Buddhism; because, although in what we call the civilized world—the countries of Europe and other western countries—these heathen religions appear comparatively insignificant, yet we must do justice to the stupendous fact that they form the religions of by far the greatest part of the human race. Buddhism is the religion of far more human beings than Christianity,\* and people who want to understand human nature cannot leave out of the account such an important fact. We want to know what Buddhism means, and what are its excellences; and, as Dr. Irons has led the way, I will venture to say that the essential principle of Buddhism concerns us now most intimately, not so much in the direction of Strauss's "Old and New Faith," which is, no doubt, pure Pantheism, but much more in those speculations to which great currency has been given in a book to which I refer with the utmost respect for its author and for its motive,—I mean Mr. Matthew Arnold's "Literature and Dogma," a book which seems to me to advocate a kind of semi-Christian Buddhism. The author's view is that the essential part of the Bible is the bringing to light "the Eternal, not ourselves, which makes for righteousness"; that you cannot verify a personal God, but you can verify a stream of tendency which makes for righteousness. Now is not that the principle of Buddhism as explained by Bishop Claughton? In what way can we deal with it? There are two ways. One is to go to the Indian, or to the English Buddhists, and start from the principle of having a revelation from God; and the other is to see whether we may, in arguing with them, start from the principle of right and wrong, which they all acknowledge, and

\* See note at commencement of discussion.—Ed.

point out, that this leads them to the acknowledgment of a personal God, and then build up the superstructure of a subsequent revelation of God in Christianity.\* On that point, I think, Bishop Claughton misunderstood Professor Chandler's letter. Bishop Claughton says, "I believe the sense of right and wrong is the strongest evidence we can have of the existence of a God." But that is what Professor Chandler says. Professor Chandler says that, taking the relative probability of evidence, there is more certainty of a distinction between right and wrong than there is of the existence of God ; and, therefore, if you are to begin on a sound and solid basis, you must accept the basis of right and wrong as admitted by Buddhism, and proceed from that with your superstructure, and not begin with the assumption of God and of revelation. This is a very important and difficult question, and deserves patient consideration. If, however, you take Professor Chandler's basis, remember that you start with this advantage : you may acknowledge that Buddhism, which obtains the assent of a majority of the human race, has obtained it on a just and right basis, and that, so far as it goes without revelation, so far it is good and true. You are not going to attempt to overthrow this element in it ; quite the contrary ; but you say these people have advanced, by their own unaided light, to a very great degree of excellence, and you are able, by the special assistance of a revelation, to lead them on further. That offers a very powerful position for us to take up, and I hope it will be carefully considered in any society like this, or by any body of men who have to deal with the heathens. (Cheers.)

Mr. SINCLAIR.—I think it is a matter for regret that we have no representatives of Buddhism, or at least of Pantheism, here to-night. It strikes me that there is very little of real substantial difference between Pantheism as we find it in Buddhism, and as it exists and prevails very extensively, I think, in modern Europe. Without undertaking to represent that system as one who believes in it, it seems to me obvious that a system of belief which has obtained such extensive acceptance amongst the human race, and decidedly also amongst men of intellect and of learning, must contain some elements of truth ; some things which it would be well for Christians to know and to understand. If I am right in supposing that there are in it elements of truth, it seems to me obvious that in order to refute the errors of Pantheism, and put our Christianity in a proper position for having a paramount claim on man's faith, we must understand and assimilate those elements of truth and goodness which I assume Pantheism to contain. I will not define clearly what those elements of truth in Pantheism are, but I will indicate vaguely some of the things it seems to contain, which have a kind of fascination for the human mind, and account for its acceptance by so many men of intelligence and learning. There is something very charming in the view of nature which it gives as pervaded in an especial sense by Divinity. I cannot enlarge upon it, I simply have a slight sense of fascination and of poetry in contemplating that point of

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\* Acts xvii. 23.

Pantheism. Then, on metaphysical grounds, it seems to me that the common mode of conceiving the relationship of the Deity to the external universe is somewhat defective. A great philosopher, Sir William Hamilton, lays it down as a self-evident proposition, that the complement of being cannot be increased. We cannot believe that anything can actually come into existence in the sense that the complement of existence is thereby increased and consequently the universe must have existed in the Deity before it existed in its present form, in some real, though it might be unintelligible, sense. Besides that, Pantheism, as it is embodied in Buddhism, has this recommendation, that it is a very great improvement on the system which it superseded. That has been admitted very expressly by the Right Rev. Bishop in his paper, and I think we can sympathize with the author of the Buddhist system, and understand him to have been of pure and lofty moral aspirations, and actuated by those aspirations in his dislike to the prevailing Brahminism. The result of his cogitations was that system which has obtained such extensive credence, and which continues to exert so mighty influence over the minds of the East. These are some of the things which seem to account for the fact to which I have referred. But there are some insuperable objections, to the intelligent Christian mind, to the acceptance of any form of Pantheism as propounded by Strauss or Arnold, or in the rather different form contained in Picton's book. One of the insuperable objections to my mind is that, according to Pantheism, there can be no such thing as moral evil. Every action of every being is simply a development according to its nature. It does not recognize any independent created will, having the power to disobey the will of the Creator. Thus it undermines the very foundation of morality, as I understand it, and certainly in the Christian sense of the word, there can be no such thing as a God with such a belief, and consequently the whole superstructure of Christian doctrine which rests on that assumption is overturned. Then, again, with respect to the wants of human nature. Professor Huxley asserts in one of the lectures contained in his "Lay Sermons and Addresses," that modern science has discovered the true way of satisfying the cravings of man's spiritual nature, which is the most astounding utterance I ever heard. I think the deepest and most ineradicable desire of human nature is for communion with a personal God—a Being morally perfect, as well as possessed of the other attributes which we regard as essential to a Deity to whom we can look up with reverence, whom we can trust with implicit confidence, to whom we can give the most fervent love of our hearts, and from whom we may hope to receive that love of which the infinite heart is capable. In that essentially and pre-eminently the dignity and happiness of human nature consists, and there is no element in our nature which is so unmistakable and undeniable. If a man can give me a religion which meets those requirements and those demands of my nature for a real morality which implies evil and moral good, and an essential distinction between the two, together with a God who is worthy of the most profound homage of which my heart is capable, and from whom I may hope to receive that love

which we regard as the proper attribute of an infinite Father ; if any one, I say, can give me a religion, from whatever source, which has rational foundations sufficient to secure my belief, and which possesses these characteristics, then I feel that that is what my nature wants ; but I feel at the same time that Pantheism, in whatever form, is utterly incapable of this. (Cheers.) Just one word more. We must make our own human nature the starting-point of all our reasonings with respect to religion, and I think there is no essential difference of opinion between the views contained in the letter of Professor Chandler and the sentiments embodied in this paper. I think there is perfect and substantial agreement between them, on the point that our own nature is a moral nature, containing within it the essence of the eternal distinction between right and wrong, and of the obligation to do right as a starting-point, and consequently conceptions of morality and moral principles and rules are possible without religion, but what we want is the moral sanction which the paper describes and the communication of power to enable us to act upon these rules and discharge those obligations ; and here Christianity seems to me to have the most undeniable advantages over any other system, whether of philosophy or religion, that has ever been founded. (Cheers.)

Rev. J. W. BUCKLEY.—I wish to say a few words with regard to the question of right and wrong, in reference to God's will. I was startled at the statement as to right and wrong being independent of the will of God. I see, indeed, a difference between right and wrong ; but is not that difference measured by each man's individual conscience ? I cannot myself conceive any morality independent of the will of the Supreme Being : I cannot understand how otherwise we are to get a rule of right and wrong, because any man's rule may be different from the rule of almost everybody else. My natural rule, for instance, would be different from the natural rule of a Buddhist. Then I want to know what are the natural virtues of which we have been talking ? Will any one undertake to define distinctly what they are ? I take it that the estimation of them must differ immensely in different individuals, so that I cannot understand what is called an abstract rule of right and wrong. For let us suppose that we should all account to one another as to our actions being right or wrong. But one man might argue : "It is a right thing, in my view, to take away the life, in a certain state of things, of A, B, or C : therefore, I may kill C if I think it right." That would be according to his rule. I do not see, then, how we can have a rule of right and wrong without a reference to some Power supreme over us all, in whose wisdom it has lain to decide what is to be right and what is wrong in this world, between the creations of His own hand. I argue thus, irrespectively of Christianity and of Buddhism, as a matter of evident truth. I believe there is no such thing as an abstract rule of right and wrong amongst mankind apart from the rule of God. You must first know whether there is any power to lay down such a rule ; and we cannot get any further, without, first of all, doing that. I conceive, that if we went

among the Buddhists, we should find that some of the actions which they have no compunction in committing are very far removed indeed from what would be permitted under our rule of right and wrong. So that where we compare Buddhism and Christianity, on the ground of the mere doing of what we call right or wrong, not taking God's will into our reckoning, I think we fail to lay any foundation from which we can judge which is the better form of religion. (Hear, hear.)

Dr. IRONS.—But the question is, has the Supreme Power any character at all? To say the Creator does as He wills and that is right, simply on that ground, would be to destroy the whole character of Deity.

Mr. BUCKLEY.—I deny that inference *in toto*. I say we are placed here with certain relations to ourselves and everything around us. We must first of all ascertain what those relations are.

The CHAIRMAN.—I am afraid we are diverging into the question between William Occam and his opponents.

Mr. WACE.—Mr. Buckley seemed to refer to me as having said that a rule of right and wrong was inconsistent with the will of God, what I meant to say was that the sense of right and wrong does involve a God as the founder of it. But the question is whether you get at the knowledge of God through right and wrong, or at the knowledge of right and wrong through God.

The Rev. T. M. GORMAN.—With regard to one speaker's question, "How are we to deal with Buddhism?" I should oppose to it the Bible and its teaching—in fact, the truth, preached with boldness and charity, as done by the Apostles. I must say I am not satisfied with the tone of Professor Chandler's letter, nor as to the way in which he would propose to settle the difficulty. With regard to what another speaker has said, I consider it is self-evident that God is the unique source of all goodness and truth, with a will, not arbitrary, but absolute in all Divine perfection.

The CHAIRMAN.—I should like to say one or two words before calling on the Right Rev. Bishop for his reply. We have had our attention called to the extreme interest of Buddhism as being the religion of one-third of the human race, and also as being a religion which is now attracting to itself the affections of a great many sceptics. Buddhism is looked upon as a superior sort of Theism recommended by historical antiquity or *prestige*; in point of fact, as a Theism consecrated by long standing. But Bishop Claughton has, I think, clearly shown us that it is not a system of Theism, but of Pantheism. We can understand the inclination of the human mind towards Pantheism. No doubt it is a natural thing to endeavour to find everywhere traces of an all-pervading Power of Good; Malebranche (who, as it is said of him, saw God everywhere) tells us, I think, that on reading some book in which he found his views on this point clearly set forth, his delight caused so violent a palpitation that he was compelled to close the volume. But the doctrine is not a new one; it was taught in the West ages ago; surely we all remember reading in Virgil:—

“ Deum namque ire per omnes  
Terrasque, tractusque maris, cœlumque profundum.”

(Georg. lib. iv.)

But I should like to ask a number of questions. I want to ask Bishop Claughton to tell us in his reply something about the connection of the Vedic literature with Buddhism; and of what importance to the Buddhists, historically, are the Rig-Veda and the other three; or I should more correctly say two, since I suppose the Atharva-Veda is of no great account. I would also ask him to tell us whether there are not several forms of Buddhism—the Cingalese, the Chinese or religion of Fo, the Tartar, and the Thibetan, which is, I presume, the most genuine of all. Lastly, I would ask whether it is not correct to say of Buddhism that it is, like every other religion, an exhibition to the world of that primitive truth which was revealed to man in the first instance, and has been retained by the Jews and by the Christian Church in its purity, but which is only shown in a distorted and degraded form in other religions? I find in Buddhism much that I find in Christianity;\* but it is strangely distorted. I find the Omnipotent, but not as a personal Deity. I find that great truth of religion, the Incarnation, but where is the God to be incarnate? There is resignation to God's will, but no God whose will one may be resigned to; and the resignation itself is contemplation until you lose your individual personalty, and are absorbed into Nirwāna, or annihilation. (Cheers.)

Bishop CLAUGHTON.—I am afraid my answer must be very unsatisfactory; but first let me say that I have listened with a great deal of interest to all those who have spoken upon this important and interesting question. I feel that in their minds Buddhism does command an absorbing interest, and I am not surprised. As to the question which Dr. Irons has put to me, you must understand that what I know of Buddhism I know from what I have gathered with my own ears, and from the lips of others rather than from books. There will be many in this room who know more from books than I do. With regard to the value of the antiquities and chronology of Buddhism, my own idea is that we are in the same position as with regard to Roman history, when we find that Livy handed down a great deal that was legendary, and that a great portion of this had been lost altogether, and we were called on to believe a great deal of what was purely conjectural and much that was altogether wrong until a Niebuhr arose and put things somewhat into shape again. The same thing has occurred with regard to the history of Buddhism. The Buddhists themselves believe that a great portion of their early religious writings are missing, and that those we have now are very imperfect indeed. My own knowledge of them, I may tell you, simply amounts to this, that I have gone through the pages read and translated to me when I was learning the language, but since then I have been too busy to go through the various writings which English or European authors have composed to throw light upon the subject. I remember the writings of my

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\* See note to Mr. Row's remarks, *ante*.

friend Mr. Spence Hardy, but I know more of them from his own lips than from his book. But I may tell you this much, that it seems to me that in Europe we are accustomed to speak very positively about those things which, in the East, people who understand them speak very doubtfully about. We are accustomed to suppose here that this or that person has come to a clear understanding of what my teachers in the East told me they knew very little indeed about. On subjects concerning which the Eastern people confess they knew so little, I was surprised to find people in England so positive. But there is no doubt that there are two or three quite distinct sorts of Buddhism. I do not want you to suppose that the Ceylon Buddhism is the only correct form: I believe the Buddisms of Siam and Burmah are considered to be the most orthodox. The Chinese Buddhism is a spurious form, and so is the Thibetan and Tartar Buddhism; indeed, it is scarcely the Buddhism at all of which I have been speaking, so you must allow for these very great varieties. I remember once taking part in an interesting conversation between the present Bishop of Calcutta and one of the most learned of the Siamese priests, on this very subject, as to the difference between the Buddhism of Siam, that of Burmah, and that of Ceylon. I was much struck by this, that the Siamese priest, who acknowledged our Cingalese Buddhism, refused to acknowledge what the bishop brought forward as Burmese Buddhism. That shows that there is a very great difference. But we do know the main features of this interesting religion, and the vast extent of the races who are subject to its influence. Now as to the point about right and wrong. When I went out to Ceylon I was well versed in one book—Aristotle,—which served me in good stead in my experiences amongst the various races I met with, and I have seen more of them than Englishmen commonly do, because, in my capacity as a missionary bishop I have lived a great deal among them, and have talked on this interesting question of right and wrong again and again. This is what I always found: there are certain things which we may call right and wrong which there are races of men who are quite ignorant of, but they all agree in this, that there are some things which are right and some things which are wrong, no matter whence we have derived our notions of these terms. But if you put before a man who never heard it before that which we Christians believe and know to be right, they recognize it. Right, truth, God—wherever you proclaim these things they leave an echo in the heart of man, provided he has sufficient intellect to understand them. There is the difficulty in the less enlightened races that you have to teach them; but I speak of races who are quite our equals in philosophy and education, and with them I have always been struck by one thing, that, when you are going over different topics, directly you bring to their minds the great truths of religion, they recognize them: the idea seems to come back to them, not as a new discovery, but as something they had known before and lost. I have preached to heathen men by interpretation, and also in their own language, and I have always been struck by what I now speak of. A certain chord was touched, and it went through all at once, and that was one of the things, among many, that convinced me of the absolute truth of Christianity.

I do not wish to be severe on Buddhism. The reason why I think it a failure in reference to the view of right and wrong is, not because the people have vices and do not always practise virtue, but because the very things which they are told are virtues and vices you cannot succeed in making them practise or avoid. Their priest tells them they need not worship, and they go to the devil temple in spite of his teaching in order to worship. He tells them not to practise certain things, and half of them go and practise them without the least compunction. They do not care for Nirwana—it is not practical enough for them—and they will endure the loss of it rather than resist a temptation. When a Christian does wrong he knows it is wrong: it is a clear case: and we try to cure him. But the Buddhist priest never goes near such men, he simply contents himself with himself leading an ascetic recluse life. If the people care to listen to his recitation of the same books, they may; if not, he is simply indifferent. As to the Buddhists being missionary, it is a vain idea: I do not think there is anything of the sort among them. It is a common thing for both priests and people to say, "It may be that your Christianity will be the religion of our children, and you may teach it to them. If our children like to believe in Christianity they may do so, but as for ourselves we are too old to change. We have been brought up in this other religion, and we do not mean to change." Once there was a feeling among the priests that they ought to stop us, and they organized a sort of mission for the purpose; but they tried, and tried in vain, to get back some of our Christian converts, and then it all ended. There is, as I have said, much natural virtue among them: I mean that many of them practise those things which we call virtues—kindness, love, courtesy, and so on,—but they have not learnt them from their priests; they possess them because they are deep in the heart of man. That is part of the meaning of what we are told, that man was created in the image of God. There is something in the countenance and in the heart of man which is like his God. Often, when I have been waiting for people to come round me to listen to my teaching, and as I saw their countenances before a single question was asked or a word passed between us, and before they had seen me—often have I been able to tell from their countenances whether they were heathens or whether they were Christians. Christian hope, love, and peace stamp themselves upon the faces of men; and when I have seen those who were not Christians draw near, I could not help feeling deep pain and sorrow, for there was a whole history written upon their countenances—every expression told of a certain hopeless subservience to vice, passion, revenge, and fear. I was a believer before I went among these people, but I came back a far more deeply convinced believer, and I would ask those who play with infidelity, and talk about it, and persuade themselves into Atheism, to go out and see what Atheism is, and what Pantheism and Heathenism of every sort are, and then come back and see what we are trying to do,—and by God's help succeed in the main in doing. (Loud cheers.)

The Meeting was then adjourned.

## REMARKS ON BUDDHISM. By J. ELIOT HOWARD, Esq., F.R.S.

THE subject is one fraught with interest to the Christian mind, as affecting the happiness of so many millions of our fellow-creatures. It has also a special claim on the attention of the Victoria Institute as affording, when viewed in a philosophic spirit, strong confirmation to the truth of Holy Writ. This Institute proposes "to examine and discuss, with reference to final causes, and the more comprehensive and fundamental principles of philosophy proper, based upon faith in the existence of One Eternal God, who in His wisdom *created every thing very good*";\* and yet we see in Buddhism the protest of a very large portion of the human race against every word in the above proposition of philosophy, which seems to us so clear and simple, because we have received these truths with unquestioning submission, as inseparable from the Christian faith.

It is as Christians that we are entitled to thank God for our creation. It is as taking a right view of Christianity, and of our personal interest in its blessings, that we are encouraged under all circumstances to place a cheerful trust in God, and to know that all things work together for good to those who love Him.

Abandoning the hope set before us in the Gospel, the most "advanced" school of German thought discovers that there is a great deal to be said for the views of life presented by the philosophy of which Buddhism, however ancient, is perhaps but a comparatively modern exponent. The philosophy of these writers has "advanced" so far that the sun of their wisdom has passed the autumnal equinox, and is rapidly descending towards the winter of *Nihilism*.

It certainly appears to our conceptions a very shocking assertion, that non-existence is, after all, preferable to existence; but in the grandest and perhaps the oldest treatise on Providence, we find the man suffering under its mysterious visitations inclining to this way of thinking, and desiring "that God would let loose His hand and cut him off."† Not only so, but those who have access outwardly to the inspired records, which might set them right, *may* hold fast the lie, though it burns into their very souls. In all such cases, true charity would lead us to seek to show that a fundamental misconception of the character of God lies at the root of all this pernicious and morbid view of the dealings of Providence.

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\* See "Objects of the Vict. Inst."—Third.  
VOL. VIII.

† Job vi. 8.

In the archives of the Propaganda at Rome, there exists (or did exist)\* an original letter of Mi-Vang, the Grand Lama of Thibet, to the Pope (date, July 8, 1742), in reply to the objection raised by a Romish missionary to his religion, which he undertook to refute. It reads thus :—

“This my writing is to the Grand Lama of your kingdom (*i.e.* the Pope). Entreat him to impart to me the argument of kindness and to pray for me. . . . In the past, the present, the future—in these three times, I have not understood that there is a law better than ours. It is your happiness alone, O missionary, to hear the exalted name of our law ! May the spirits that are contrary to this law be destroyed.”

What, then, is this law, and what is its object of worship ? We have already heard something of the merits and demerits of the former, and it is not desirable that I should add to this, except one observation, that the measure of benevolence or kindness to which the system tends, seems to me its only recommendation. It has this tendency in common with all mystical forms of thought. Aristotle has the remark that “as many as are superior are also melancholy ;” and there is something not only pleasing and attractive to a certain class of minds in the Indian philosophy, but also that which, by the endeavour it excites to suppress all the fierce passions of humanity, leaves room for the gentler emotions of pity and compassion ; these last being strongly stirred by the view presented of the miseries of the world. “*On every side,*” says the Lama above quoted, “*are infinite pains, even to the spirit.*” The spirits of Jithars, though they do not feed on material things, equally endure the greatest punishments. The infernal ones, condemned, dwell in the fire,—on every side there are infinite torments, and the inhabitants feel the pain and the punishment.”

It will be in some measure intelligible, that in the midst of the miseries attending the decline and fall of the Roman Empire, the minds of many Christians should incline to the same manner of looking at things existent around them. Nor shall we be surprised if we find the stream of mysticism and the ascetic doctrines of the East mingling with and corrupting more and more the pure faith of the Gospel as time rolled on its course.

Again, we find in our own history and amidst the fierce contests and religious animosities of the seventeenth century, mystical sects of religionists arose, whose revulsion from the order of things around them had some considerable analogy with the early conflict of Buddhism with Brahminism.

The great glory of the Christian revelation is that it presents before us a personal God and Saviour. It is to this that the Apostle John turns the attention of his readers in his first Epistle, which he writes in conflict with the “seducers” of the day,—Gnostics imbued with the mysticism of the East. He declares that which he had seen and heard, that his hearers

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\* Published in the *Alphabetum Tibetanum* of A. A. Georgius ; also in the *Inquirer* (London, 1839), vol. ii. p. 194.

might with him have fellowship with the Father, and with His Son Jesus Christ ; and that so their joy might be full.

The spirit of man cannot cling to a *nonentity*, but, rightly led, it can flee to the embrace of a loving Father. The Buddhist Lama can say that "all punishments proceed from sin," but his system contains no atonement, no power of rolling away sin, no faith in a *Personal Saviour*.

In regard to the object of worship presented to the Buddhist, I remark that the Buddha is nothing more than *man*, a "descendant of the first king of men." For "there are eight qualifications that must be possessed by the being who receives the assurance of becoming a Buddha,"\* of which the first is, "He *must be a man*, and not a *déwa*. It is therefore requisite that the Bódhisat † continually keep the ten precepts, that *he may have the merit to be born as a man*." Second, He must be a male and not a female ; and therefore the Bódhisat must avoid all sins that would cause him to be born as a woman. Third, He must have the merit that would enable him to become a *Rahat*—all evil desire must be destroyed. . . . Fifth, *There* must be the abandonment of the world, and the Bódhisat must become an ascetic. . . . He must exercise a firm determination to become a Buddha, and were he even told that in order to obtain its exalted rank he must endure the pains of hell during four *asankya kap lakshas*, he must be willing to suffer all this for its sake."

It is obvious that the stream cannot rise higher than its source, and if the object of worship be a *failing man*, the worshipper will not attain to any greater exaltation than the one whom he worships.

Now the present Buddha (for he was preceded by 24) passed through a great variety of conditions (some 550 at least) before he was born. In the course of these he acquired a great deal of experience from his intercourse, not only with men but with animals, which he could recount at leisure, and become a very interesting companion ; so that Buddhist literature, which records these conversations, seems to resemble *Æsop's* fables. He was (as recorded in the *Jatakas*) "an ascetic 83 times ; a monarch, 58 ; the *déwa* (spirit) of a tree, 43 ; a religious teacher, 26 ; a courtier, 24 ; a *próhita* brahmin, 24 ; a prince, 24 ; a nobleman, 23 ; a learned man, 22 times ; an *ape*, 18 ; a merchant, 13 ; a man of wealth, 12 ; a deer, 10 ; a lion, 10 ; the bird *Housa*, 8 ; a snipe, 6 ; an elephant, 6 ; a fowl, 5 ; a slave, 5 ; a golden eagle, 5 ; a horse, 4 ; a bull, 4 ; . . . a potter, 3 ; an *outcast*, 3 times ; besides being twice each a fish, an elephant-driver, a rat, a jackall, a crow, a woodpecker, a THIEF, and a pig ; and once each a dog, a curer of snake-bites, a GAMBLER, a mason, a smith, a *devil dancer*, a scholar, a silversmith, a carpenter, a water-fowl, a frog, a hare, a cock, a jungle fowl, and a *kindura*," ‡ whatever that may be. It "is evident" (says Mr. Hardy) "that this list is imperfect" ; but it is sufficient for my purpose

\* See the *Sujáta Játaka*, as translated by Hardy in *Manual of Buddhism*.

† Candidate for Buddhaship.

‡ Page 100.

that it is not very select. To have kept the ten commandments of Buddhism under all these circumstances does not indicate that a very high tone of morality is rendered necessary in so doing.

But there is much more than this to be noted, for the very virtues by which he was entitled to become a Buddha, are full of trampling on the rights of others. In order to renounce the world, he gave in alms, or as charity, his eyes, head, flesh, blood, *children*, *WIFE*, and substance, whether personal or otherwise, as in the Khadirangara birth.\* The sufferings of the poor children given away by the heartless father † to a tyrannical Brahmin in order that the former might attain Buddhahship, are told in a way to excite our compassion." ‡

In various other births he accumulated a great amount of virtue, and set his mind to what is excellent—giving away that which he enjoyed to aid the necessities of others, and regarding with an equal mind those who exercised upon him the most severe cruelties, and those who assisted him and were kind. This may be all very well for a Stoic, but falls far short of Christian forgiveness of injuries. What shall we say to the Tinduka birth, § in which the Bódhisat appears as the king of 80,000 monkeys, and himself *sets fire to the house of an old woman* in order to rescue his troop from danger they had incurred in a plundering expedition ?

I turn from all this and come to the records of the actual life of Buddha on earth ; in which, rejecting all the absurd fables about his conception and birth ("effected without pain," p. 145), I learn the same lessons. On the day on which he was born he walked seven steps towards the north, a lotus rising up at every step, after which he exclaimed, "*I am the most exalted in the world ; I am chief in the world ; I am the most excellent in the world ; hereafter there is to me no other birth !*" || "It was at the utterance of these words, which were spoken as with a voice of a fearless lion, and rolled to the highest of the brahmalokus, that the Brahmas and Dewas assembled to do homage to the new-born prince."

Need I point out the contrast as to the lessons to be learned from the birth of our Lord, and with *his* words, "Come unto me, all ye that labour and are heavy laden, and I will give you rest. Take my yoke upon you, and *learn of me, for I am meek and lowly of heart.*" What is more evident than that this is the very thing which poor sin-ruined man needs—REST! If it were not for this promise, I think *Nirwana* might be the height of his ambition—the object of hope,—if hope that may be called where *hope* is none!

For all the woes of the world Buddhism affords no balm. Stolid resignation is all that it can teach. Attainment it has none, except for those who enter upon and continue in the four paths that lead to *Nirwana*.

\* Page 102.

† Page 121.

‡ The father tears the children from his embrace and gives them up to cruel slavery, exclaiming "May I by this become the *All-knowing.*"

§ Page 113.

|| Page 146.

It would be interesting to follow the history of Buddha until his death in the city of Kusinara (from eating diseased pork), the record of his combat with the Evil One for *the sovereignty of the world*, and the various travesties of Christian verities apparent in this religion ; but it is not necessary that we should take all this trouble to prove Buddhism a failure. In its encouragement of the celibacy of the clergy ; in its absence of all spring of motive for active benevolence ; in its sloth and laziness, under the specious guise of contemplation ; \* it has done much towards corrupting the world, and this more especially through the false view given of the Divine character.

On the other hand, Christianity in its true form attests its heaven-born excellency in every way ; not the least in its practical works of charity and of benevolence abounding on every hand, speaking forth, with a voice that cannot but be listened to, that God is Love.

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\* To meditate on the thirty-two impurities of the body, and on the three truths,—its impermanency, pain, and unreality,—is a highly religious exercise.

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## ORDINARY MEETING, FEBRUARY 2ND, 1874.

C. BROOKE, ESQ., F.R.S., V.P., IN THE CHAIR.

The Minutes of the last Meeting were read and confirmed, and the following elections were announced :—

**MEMBERS** :—The Right Rev. the Lord Bishop of Nelson, D.D., Nelson, New Zealand ; Rev. W. R. Arrowsmith, B.A., Vicar of Old St. Pancras, 22, Camden Cottages ; Rev. J. Bourne Brookes, B.A. (Cantab.), Clergy House, Calvert Street, London Docks ; Rev. J. Hetherington, 12, Alfred Place, Liverpool ; Rev. W. R. Blackett, M.A., 65, Bedford Street, Liverpool ; A. E. Gayer, Esq., Q.C., LL.D., Abbots Leigh, Upper Norwood.

**ASSOCIATES** :—Sir George le Grand Jacob, K.C.S.I., C.B., Major-Gen., 12, Queensborough Terrace ; T. Stanton, Esq., Presteign, Radnorshire ; Rev. W. A. Cornwall, Widcomb, Bath ; Rev. F. A. Billing, LL.D., F.R.S.L., 1, Deptford Bridge, Greenwich ; Rev. F. H. Joyce, M.A., Oxon., Vicarage, Harrow ; Rev. E. Price, 49, Downs Park Road, Shacklewell ; Rev. T. W. Wrench, M.A., 11, Bedford Place, Russell Square.

Also, the presentation of the following books to the Library :—

“Proceedings of the Royal Society.” Part 148. *From the Society.*

“Proceedings of the Royal Geographical Society.” Part 1., vol. xviii.  
*From the Society.*

“Creation and Modern Science.” *From J. W. Lea, Esq.*

The following Paper was then read by the Author :—

*THE CONTRAST BETWEEN CRYSTALLIZATION  
AND LIFE.* By JOHN ELIOT HOWARD, Esq., F.L.S.,  
F.R.M.S., F.R.H.S., Memb. Pharm. Soc. and Botanical  
Soc. of France, &c.

IT is well known that powerful and persevering efforts have recently been made to confound the distinction between animate and inanimate matter; to represent life as merely a special form of chemical or mechanical action, and organization as the result of some undiscovered correlative of the molecular forces of nature. It has been supposed that the notion of Deity, or of an omnipotent creative and sustaining power, may be thus removed to a greater distance from the human mind; and the unwelcome thought of responsibility to a higher tribunal than those of earth, and of subjection to an eternal judgment, abolished. That so little success has as yet attended the prophets and teachers of this new doctrine, is not owing to any lack of earthly distinction attaching to the eminent names of its propagators, nor to any want of appreciation of their own merits and those of their fellow-labourers. It might almost be said that they form a mutually supporting and a somewhat exclusive sect.\* But they have before them an impossible task, for though they possess abundance of intellectual resource, and could therefore hope to "make the worse appear the better reason," yet they have to overcome the impracticably *practical* character of the average English mind, and its strong common sense, to say nothing of its attachment to its cherished traditional opinions. It is not the present generation of Englishmen who will believe that life was brought down to this planet by some fragmentary disrupted portions of a ruined world; neither will they be reconciled to the thought that they are really in their origin "viler than the seaweed," and in their gradual fashioning improved out of the most lowly organized animals † that the earth and the sea support.

*Works of Preceding Authors.*

2. As I mean to follow out my own line of thought and

\* See Appendix (*Edinburgh Review*).

† The *amœbas* and *moners*. See Appendix (C).

observation, it is not requisite that I should notice, unless very briefly, the works of others who have treated of the same subjects. It will, however, be expedient that I should, in the first place, acknowledge my obligations to an author from whom I shall take the liberty of quoting; and in so doing claim not merely as an ally, but as one who has already overcome his opponents in a well-fought field of argument. These antagonists do not seem to be exactly such as one would choose to encounter; for he says that as soon as they enter on the vital question, "they assume the tone of the advocate, of the proselytizer, of the zealot, and to such energy everything must yield—unproven and unprovable assertions have been advanced over and over again, until it becomes tiresome to notice them."

3. This is alarming, but I must hope to fare better than my predecessor, as these opponents will have learned moderation by experience of their present want of success.

*Dr. Beale.*

4. "The theory of vitality" has been so admirably discussed by this author, the eminent physician and admirable microscopist, Lionel S. Beale, M.B., F.R.S., F.R.M.S., that I need only say I rejoice that his (as yet unanswered) works are in possession of the Institute, so that the Fellows can verify any allusions I may make, and judge for themselves whether the highest commendation I can bestow transcends their merit. It will therefore be understood that, in pursuing my own argument, I am not at all insensible to the claims of that which has been thus incontrovertibly adduced on the right side of the question. Dr. Beale has fully proved that "creative force is as far removed as ever from non-constructing force; and the great life-mystery, in spite of the efforts and consummate skill of physicists and chemists, remains a mystery as great as when in childhood the longing first arose to inquire into the why and how."

*Dr. Huxley.*

5. It is necessary that I should also say a few words as to the views which Professor Huxley expounds in his "Lay Sermons." I trust that, in appealing specially to the statements which I there find, I shall not be thought to be unfairly reviving exploded dogmas. I claim to be one of "the few writers who have taken the trouble to understand the subject," and whose

views have not induced the learned Professor to withdraw his work : the fourth edition of these sermons is that from which I quote, and this edition, issued in 1872, is now, as I find, in full sale, and much sought after.

6. It is with great respect and admiration for the truth-loving character of his mental constitution, as evidenced in his works, that I name Professor Huxley. The outspoken fearlessness with which he propounds his convictions, is worthy of a better creed and of sounder philosophy. I have never listened with so much pleasure to any scientific instructor ; and it is of course with reluctance that I feel compelled to differ so absolutely from his conclusions as will presently appear. He inspires his hearers with a wholesome confidence in their power to understand propositions expounded to them in well-chosen English phrases ; and does not attempt the mystification which clothes learned ignorance under the specious guise of transcendent absurdity wrapped up in high-sounding Greek. Even when he verges on this objectionable course—as I think that he does in the properties which he attributes to *protoplasm*—it seems to me that the defect arises from his misconception of the nature of the subject on which he treats. In the commencement of his lecture\* on “The Physical Basis of Life,” he says, “In order to make the title of this discourse generally intelligible, I have translated the term ‘Protoplasm,’ which is the scientific name of the substance of which I am about to speak, by the words ‘the Physical Basis of Life.’”

7. Now, I must be permitted, and Professor Huxley himself would specially urge it upon me, to bring this information into correlation with whatever knowledge I may previously have acquired. In the first place, then, I am dissatisfied with the word itself, since *πρῶτον πλάσμα* would, if I mistake not, most correctly mean “the first image,” or “the first fable or fiction.”† But let this pass, and take it, as I suppose is meant, as “the first thing formed.” Then I have a right to inquire who or what is the *former* ; and also where is the *proof* of its being the first thing formed. Professor Huxley himself, in treating of “vitality” and “aquosity,” brings from amongst the imponderables the electric spark ; and by means of this unites his oxygen and hydrogen to form water, the properties of which

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\* “The substance of this paper was contained in a discourse which was delivered in Edinburgh on the evening of Sunday, the 8th of November, 1868, being the first of a series of Sunday evening addresses upon non-theological topics, instituted by the Rev. J. Cranbrook.”—*Lay Sermons, &c.*, p. 120.

† Liddle & Scott's *Lexicon, &c.*

he truly describes as altogether different from those of the gases. Why may I not equally suppose that organization proceeds from some "*subtle influence*" working first amidst and from the essence of imponderable matter; and disclosing its presence by its effect on the albumen and oil, and whatever else may be the first scene of its operations? Are not the manifestations of electricity as far out of the range of our *à priori* conceptions as the latter hypothesis can be? Who can tell us exactly what electricity is, or (except from its effects) what is life?

8. My next difficulty is a still more serious one. The Professor having thus defined a substance which he terms "a physical basis or matter of life," goes on to describe many wonderful properties attaching to it. But to look at this matter from a chemical point of view, we must first inquire what this substance is. Is it one thing, or is it a congeries of varying material to which no homogeneous character can be ascribed,—and, still less, such attributes imputed as we soon find? A chemist, in order to form an idea of the properties of a substance, will sedulously endeavour, if possible, to isolate it from other bodies (by crystallization for instance); and when this has been effected, we have something concerning whose molecular changes we can inquire. But if we take an egg,—as this seems to be the easiest mode of looking at that "*protoplasm*" which we are told has *an identity of substance in all living being*,—what do we find but a collection of material suited for the building-up of the structure of the new creature. As we shall see presently, some electrical force soon begins the analysis, and carries the albumen to one pole, and the oily particles to another. Professor Huxley tells us that "a nucleated mass of protoplasm turns out to be what may be termed the *structural unit* of the human body."\* But if a contractor were to cause to be brought together into one spot the whole of the material for building a house, would it be reasonable to call his thus furnished yard the *structural unit* of the future edifice? Further, would it be possible to imagine that the brick and mortar, the beams and tiles, had combined together to draw the plans, and by some molecular machinery of their own, found power to realize these plans?—"a great number of parts combining to perform each function, each part doing its allotted share of the work with great accuracy and efficiency, but being useless for any other purpose." †

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\* *Lay Sermons, &c.*, 4th edit., p. 127.

† *Ibid.*, p. 126.

9. "Protoplasm, simple or nucleated, is the formal basis of all life; it is the clay of the potter," says the Professor.\* This may be very true, but we have been told before that it is virtually the clay and the potter too; and all this is attributed to *molecular* action.

10. Professor Huxley informs us† that the direction towards which modern physiology is tending, is towards the conception of life "as the product of a certain disposition of material molecules;" and he then seeks to show us how to escape, by taking refuge in the mysticism of Descartes, from the materialism towards which modern science thus conducts us. The simple reply to all which seems to me to be, that all we know of the action of *molecular* forces forbids such a supposition being entertained for a moment.

#### *Fundamental Errors.*

11. It is this fundamental error—the  $\pi\rho\acute{\omega}\tau\omicron\nu$   $\psi\epsilon\acute{\upsilon}\delta\omicron\varsigma$ , of this new school, that I here attack—the notion that molecules of matter may combine to act in a manner wholly foreign to the laws which govern them, and to produce results of organization which are wide as the poles asunder from all their powers. In order to effect this, *protoplasm* is made to do service in a way not anticipated by Mohl, who is *understood* to have first applied the term to the substance formerly termed by the Germans "*Schleim*," a much more descriptive word, for supplanting which no scientific reason can be given; "*Urschleim*" again being far more characteristic for deep-sea protoplasm than the objectionable "*Bathybius*" of Huxley—*objectionable* as taking for granted what is not, and probably cannot be, proved as to its nature.‡

12. I must next remark that those (and they are many) who use the terms "molecular organization," "molecular forces," and "molecular machinery," imply that they are conversant with, and give in their adhesion to, the atomic theory; for it is only in connection with this theory that "molecules" have any definite meaning. At the same time, we may observe these very persons using the terms "molecule" and "atom" as synonymous; thus demonstrating either their entire ignorance of the subject, or their willingness to impose on those who incautiously afford them their credence, by a use of apparently learned words

\* *Lay Sermons*, p. 127.

† *Ibid.*, p. 142.

‡ See Dr. Lionel Beale's *Protoplasm*, pp. 20-21, for description of *Bathybius*. See also Appendix (C).

to veil absolute want of sense ; than which nothing is more pretentious or more imposing ; for, as Pope has well said,—

“ True no meaning puzzles more than wit.”

Of which maxim we may take the following sentence as an illustration :—“ These phenomena are due to the properties of the *molecular machinery*, which has long been known to *exist in the imaginations* of highly-gifted persons ; and although, as yet, no one has succeeded in actually producing such machinery artificially, the efforts of the philosophic imagination tend towards such a consummation.”\*

13. The strict construction of this sentence would, I suppose, require us to believe that the “ molecular machinery ” exists in the imaginations of certain persons, who are thereby enabled to become the prophets of the coming age. In what respect this qualification can differ from that which is called in Scotland “ having a bee in one’s bonnet,” I am unable to judge.

14. The *Edinburgh Review* (April, 1873) † has well disposed of the claims and exposed the presumption of “ the pseudo-scientific sect—the sect of the Darwinian evolutionists ; ” and the *Quarterly Review* (Oct., 1873) has given its powerful aid in combating the views of Herbert Spencer ; my argument is, however, not superfluous (as I trust), but simple and definite, aiming to controvert the errors of the same school on one special but fundamental point ; and I select from amongst the statements of the leaders the following sentence from the foe-man whom I deem most worthy of my steel.

15. “ The difference between a crystal of calc spar and amorphous carbonate of lime corresponds to the difference between living matter and the matter which results from its death. Just as by chemical analysis we learn the composition of calc spar, so by chemical analysis we ascertain the composition of living matter. It is not probable that there is any real difference in the nature of the *molecular forces* which compel the carbonate of lime to assume and retain the crystalline form, and those which cause the albuminoid matter to move and grow, select and form and maintain its particles in a state of incessant motion. The property of crystallizing is to crystallizable matter what the vital property is to albuminoid matter (*protoplasm*). The crystalline form corresponds to the organic form, and its internal structure to tissue structure. Crystalline force

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\* *The Mystery of Life*, p. 68, quoting from Introductory Lecture on Life, &c., *British Medical Journal*, Oct. 22, 1870.

† Appendix (A).

being a property of matter, vital force is but a property of matter."\*

16. This is all clear and definite. Nothing is wanting but accuracy in the foundation facts, and logical sequence for the superstructure.

17. To prove this, I must beg my audience to accompany me through a dissertation requiring some close attention.

#### *Atoms.*

18. In the first place, then, as to *atoms* and *molecules*. Ponderable matter is no doubt (*in thought*) infinitely divisible, but, in reality, this division has a limit beyond which the most powerful forces which we can bring to bear have no longer any effect. We therefore call these ultimate particles of matter *atoms*, from the Greek *ἄτομος* (from *ἀ* privative, and *τέμνω*, I cut), implying that which is incapable of any further division.

19. Notwithstanding their excessive minuteness, we have succeeded in assigning some of their properties, such as determining their relative weight. Of their form we are completely ignorant, but the probability is that they are spheroidal, and that each atom is a microcosm in the sense of having polarities and capacities of revolution on its axis, like the sphere of the earth.

20. A certain property of these *atoms* has received the name of *atomicity*,† indicating their capacity for combination. We know that 1 atom of chlorine combines with 1 atom of hydrogen, 1 atom of oxygen combines with 2 atoms of hydrogen, 1 atom of nitrogen combines with 3 atoms of hydrogen, 1 atom of carbon combines with 4 atoms of hydrogen.

21. These simple bodies differ among themselves by their capacity of combination with hydrogen, this being measured by the number of atoms of that element which they are capable of fixing.

22. A somewhat different property of atoms is their *affinity*; the cause, whatever it may be, of chemical combination. When a mixture of oxygen and hydrogen has been exploded to form water, we say that *affinity* has united the two primitive gases into a homogeneous liquid. The affinity is measured by the quantity of force (*vis viva*) which is transformed by the effect of combination, and which is manifested as heat. The energy with which a body combines with another body is looked upon

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\* *Protoplasm*, p. 24.

† I am not answerable for this term, to which exception may be taken, neither do I pledge myself to the exact accuracy of the definition. It seems provisionally necessary.

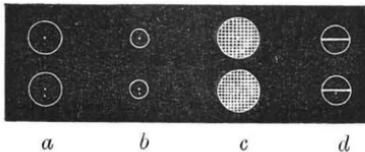
(rightly or wrongly) as independent of the faculty which it possesses of attracting one or more atoms of this last.

*Molecules.*

23. I have now to address myself to the attempted explanation of *molecules*, and I acknowledge to myself the difficulty, perhaps impossibility, of presenting to a non-chemical mind any exact idea of what is meant by this term. It has been well said that "in the least grain of dust, which appears to us inert, there exists an assemblage of vibrating atoms of magnificent arrangement, placed in lines, with a *fabulous precision* amongst themselves; and in such great numbers, that the most lively imagination is confounded."\* Let me, then, clearly explain that a *molecule* is an *aggregation of chemical atoms*. We cannot call it a compound atom, for this would be a contradiction in terms, but the aggregation must be understood to act in certain senses as a unit.

24. In the gaseous state, the molecule of simple bodies is composed of many atoms of the same nature united together thus: the molecules of oxygen (*a*), of hydrogen (*b*), of chlorine (*c*), and of azote (*d*), are composed of two atoms turning one round the other, absolutely as the stars which form double stars are understood to do, and by constraint of the same laws.†

25. They may be represented thus:



Their oscillation round each other may be figured thus:—



\* *Monde des Atomes*, avant-propos, X.

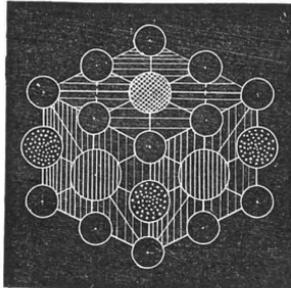
† *Monde des Atomes*, p. 24.

26. As I give none of these statements on my own individual authority, I must refer my hearers to those works in which they are treated of, where they will find, if I mistake not, something like mathematical demonstration of the truth of the facts.

*Crystallization.*

27. When we leave the consideration of gaseous bodies and approach those in a fluid or in a solid state, we have occasion to believe that in the molecular constitution exists the reason for the difference between these states, and for the phenomena of transparency or opacity of bodies. It is not essential to my argument to pursue this theme; and it would not be possible in the present space of time to do justice to the subject: but I must endeavour to present the more complex idea of the molecule of mineral structure, especially as the mineral state is assimilated in the above passage to the state of death, and crystallized matter to the state of life.

28. I will, in the first place, bring under notice a traced copy of the form and arrangement of the molecule of a mineral (*Idocrase*), such as is inferred from the chemical analysis and from its mode of crystallization. I take this from a work published in 1873 by the eminent M. Gaudin, who is Calculator of the Bureau des Longitudes and Laureate of the Académie des Sciences at Paris. The molecule of this body is believed to represent a cube, of which three sides are seen in perspective in the accompanying projection. The lines along which the forces act are represented by dots, and the nature of the atoms is shown by the shading.



29. In this conception of the molecule, everything is understood to be arranged with mathematical certainty, and all ordered according to fixed and unalterable laws; so that, however numerous the molecules may be, each atom fills the like

place in each individual molecule, and all spin on their axes or vibrate according to arrangements which are as invariable as those which guide the earth in sweeping round the sun, and give us the seasons in their appointed course. No possible mutual agreement or spontaneous action can be supposed to take place among such bodies; and the idea of "molecular machinery" of any description displays as much ignorance, *chemically*, as, *astronomically*, the old conceit that the stars were really fixed, and moved in their orbits by a grand celestial orrery—"Cycle and epicycle, orb in orb."\*

30. It must be fully understood that it is not in any way essential to my argument to show that the particular form assigned to the molecule of *idocrase*, or the exact constituent, must necessarily be correct in all points. It is simply a convenient illustration, and any other mineral might answer the purpose. I do not insist on those who are not equal to the task of grasping the mathematical and chemical proofs adopting the chemical theory of *molecules*; but I think all ought to insist on this—that the self-ordained instructors of the people should cease to use language such as "molecular machinery," which is either wonderfully ignorant or wilfully misleading.

31. I now come to the phenomena of crystallization, which are but a modified action of the same forces, working with the same mathematical regularity, with the same precision, adding molecule to molecule, in balanced, orderly arrangement. Often have I watched with interest the beautiful play of polarities which is manifested in crystals forming on the surface of a cooling solution; † when the small needles seek or are repelled by their neighbours, according to the magnetic poles as they are developed; but I never should have dreamed of any person, however ignorant, making the above strange assertion, that a body in a crystallizing state, is to that in an amorphous state, as life is to death, or living matter to dead matter. Who is there that cannot see the difference between motion impelled by electrical current, and motion the result of voluntary choice and will!

32. "If we pour into a saturated solution of sulphate of potash a moderately concentrated solution of sulphate of alumina, and stir this mixture briskly with a glass rod, there follows immediately a disturbance in the liquid, and, at the end

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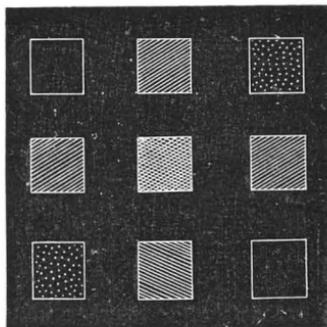
\* See Milton, *Par. Lost*, book viii. l. 84. I can "correlate" the expression "*molecular machinery*," only with another term I meet with, "organized common sense."

† *Potassic chlorate* is a good substance to observe.

of some seconds,\* crystals are precipitated of marvellous lucidity, sparkling like so many diamonds, which are, *without exception*, crystals of potassic alum in regular octohedrons; and if we suppose the diameter of these crystals equal to a millimètre, it will result from this experiment, that in the short space of a minute of time there have been produced molecules of alum composed, each one of 94 atoms, grouped amongst themselves with a perfect order, and that always the same;” the groups arranged in lines amongst themselves with an absolute precision, and in so great a number that I will not fatigue my readers with the recital of the attempted calculation, but refer to the original work, which I have pleasure in presenting to the Institute.

33. What then has the chemist done? Has he approached to the communication of life? Certainly not. He has simply brought the molecules of the different fluids into such juxtaposition that the play of affinities can take place; that atom can displace atom according to the inevitable laws of affinity and atomicity; or (as the Greeks said) of *Eros* and *Anteros*, of love and of hate. When the new combinations have taken place, the phenomenon of crystallization follows as a matter of course, simply because the molecules are different and differently arranged.

34. In order to place this part of my argument in as clear a light as possible, I will, in the first place, copy from the same author † a sketch of the probable manner in which molecules



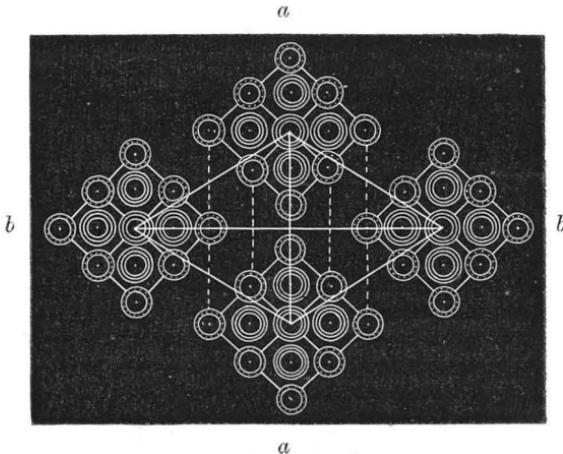
assemble side by side to form a *square* prism. It will be understood that the square figures represent not *atoms* but

\* Many other instances might be adduced *more* striking in their instantaneous effect.

† *Monde des Atomes*, p. 65.

*molecules* of different substance, as indicated by the different markings. The crystal is commencing from the central cube; to which, according to probability, the others add themselves two by two or otherwise according to the laws of *crystallogenesis*, which we are beginning slowly to understand. The point essential to my argument is the simplicity of the process of crystallization, resembling the addition of brick by the builder; the completed wall, however extensive, being the result of a thousandfold repetition of the same act.

35. The next figure that I shall place under the eye of the reader represents the probable formation of a rhomboidal crystal, commencing by the assemblage of two molecules (*a a*) oscillating



round their axis, till, the opposite poles approaching, they fix themselves in the position of greatest proximity indicated,—the other molecules (*b b*) adjoining themselves subsequently at a greater distance.

36. The rough copy I have made does not attempt to do justice to the beautiful drawing of the original; which indicates the horizontal plan of four molecules of *epidote*, and (by an arrangement of M. Gaudin's) denotes the constituent atoms; neither can I give the mathematical calculations, for all which I refer to the original work. The point which I insist upon is the simplicity of the nature of crystallization, and the apparent analogy of the forces which bind together atoms into molecules

\* *Monde des Atomes*, p. 66.

with those which arrange molecule with molecule into a crystalline arrangement. It is but to repeat this a millionfold, and a manifest crystal is formed.

37. Will it be *seriously* asserted that there is any comparison between crystalline and non-crystalline matter, and the contrast which, once established, can never be reversed, between living and dead matter. We cannot "revive" that which is, according to modern phraseology, "devised," though we can dissolve and recrystallize as often as we will.

### *Living Matter.*

38. Dr. Beale informs us\* that not even the smallest living particle seen under the 1-50th of an inch, or say less than the 100,000th part of an inch in diameter, consists of matter in the same state in every part; for it consists of, 1st, *living matter*; 2nd, matter formed from this; and 3rd, pabulum which is taken up by the living or germinal matter. The transition from one state into the other is sudden and abrupt, so that matter cannot be said to half live or half die. The germinal or living matter is always transparent, colourless, and as far as can be ascertained, perfectly structureless. This formless living matter moves forwards and burrows, as it were, into the nutrient pabulum, some of which it takes up as it moves on. It is not pushed from behind, but *it moves forward* of its own accord. This *spontaneous movement* is a characteristic of every kind of living matter. Living bodies exhibit the most active movements in various directions; a portion which is at one moment in the lowest point of the mass will pass in an instant to the highest part; one part will seem to pass through other parts, while the whole mass moves, now in one and now in another direction, and movements in different parts of the mass occur in directions different from that in which the whole is moving. Well may the intelligent observer remark, "What movements in lifeless matter can be compared to these?"

### *Life.*

39. I shall preface my necessarily brief observations on this subject, by remarking that, as far as we know, *Life always proceeds from Life*. In the opinion of the ancients, animals crept forth ready formed from the earth (*primis prorepserunt animalia*

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\* *Protoplasm*, pp. 33-37.

*terris*), and the mud of the Nile continued to produce monsters. Since that time the notion of spontaneous generation has receded gradually from view; having been driven from one hiding-place to another, by means of scientific and microscopical research; until in the present day it has been brought as nearly to the vanishing point as possible, through the labours of Pasteur and others. Those who still cling with pertinacity to this opinion will not deny that even if all they contend for (fruitlessly as I believe) were established as facts, these facts could not interfere with the general proposition above advanced.

40. In the next place it is obvious that since the commencement of the recorded history of animal life, as it has left its record in the ages of the past, *the mould (or type) in which creatures are formed has never been replaced.* Very many, certainly not less than 40,000, species of more or less noble and distinguished plants and animals have disappeared altogether from the earth, having been either exterminated by the hands of man, or having in other ways perished; whilst we cannot point to a single new species as having been introduced, either in the course of nature, or as created by the hands of man. "*The whole lapse of geological time has as yet yielded not a single new ordinal type of vegetable structure.*"\*

41. This is strikingly contrasted with facts with which chemical science has made us familiar. Numberless new bodies have rewarded the pains of the experimentalist, who has been able, under the guidance of the atomic theory, to foresee the possibility of the existence of such and such a substance; and to take the needful steps so to alter or modify the atomic structure as to produce the result desired. In many cases we may assert that these products of human skill have never before existed; and yet they have their distinctive properties as fixed and unalterable as the law of gravitation itself.

42. For instance the chemist may take sulphur from the volcano, and oxygen from the air; he may separate iodine from the seaweed, and vegetable alkaloid, the product of processes of growth in certain plants growing at immense altitudes above the sea-level. He unites these for the first time; and produces new substances, having most definite forms of crystallization, by which the *Herapathite*,† as it has sometimes been called, of one alkaloid can be readily distinguished from another.

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\* "Persistent Types of Life," Professor Huxley quoting Hooker's *Essay on Flora of Tasmania*. See *Lay Sermons*, p. 203 and p. 216.

† After my late lamented friend, Dr. Herapath.

These have again special relations to the rays of light; and disclose under the microscope objects of marvellous beauty to the human eye, which *never* can have beheld them till our generation.

43. I must claim, as one of the *pièces justificatives\** of my argument, the admirable address by Dr. Russell to the Chemical Section of the British Association, Sept. 18th, 1873. The formation of Alizarine to take the place of madder, as there described, was strictly in accordance with the guidance of the atomic theory. An important manufacture has thus been established, and thousands of acres liberated for purposes more useful to man.

44. When the Biologists have done, I will not say as much, but when, in following out their theories, they have succeeded in creating one of the least of the creatures that plagued the Egyptians, I shall consider those theories worth examination.

45. Another point of very manifest and obvious contrast between crystallization and life is the *character of the unification*. In the crystal this is simply *aggregation*, the form being the result of forces which bind together molecule to molecule. Each part of a crystal might be removed, and the last portion would be as much crystal as the whole was at the beginning. As in the brick wall to which I have referred, brick by brick might be removed until only two bricks remained united together, but the character of their union would still be that of the entire structure.

46. But it is not so in an organized body. Here there is *union* of parts, all working together for the good of the whole. It may be compared with the oneness of an army, in which all the divisions are ordered by one ruling mind,—unseen it may be, but all-operative; and banding together all the soldiers into one harmonious *unity* of action. If in action one portion of the army is hardly pressed upon, orders are given by the commander for another corps to move to its support. So, it is most familiar to the cultivator of plants, that he has to do with an *organized structure*; and he takes his measures accordingly. So with the physician, who in the same manner calculates his resources for aiding the self-healing and self-sustaining power, the *vis medicatrix natureæ*; which is, after all, chiefly to be relied upon for the preservation of the creature.

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\* Another of these will be found in the beautiful researches of Dr. Hoffmann, and specially in his recent formation of cumarine, "by displacement of atoms in the molecules."

47. The contrast between a living man and a statue is, then, very instructive as to the points we are considering. Both are continually losing particles of matter; but the living body is continually replacing these by an organization which keeps up from childhood to old age the identity of the body, repairing its losses, retaining the specific type throughout. Let us imagine our statue formed of protoplasm, and of this "formified," "vacuolated," "differentiated," "nucleated" to the utmost perfection, and, moreover, provided with all the "subtle influences" we can command, whether of electricity, magnetism, or any other force, and we should have a structure not only incapable of thought or action, but tending rapidly to dissolution; and with so much the greater rapidity, as the "forces" were accumulated within. "Something is wanting" of a totally different nature to the above forces, and this something is *life*.\*

48. The notion of a crystal having any properties akin to those of a living structure appears to me to indicate entire ignorance of the first principles of crystallography, or even of chemistry.

49. A further contrast is shown by the absolute certainty and uniformity of action exhibited by the *chemical*, *mechanical*, and *correlative* forces. These, in their operation, are "fixed as fate," and the slightest deviation from their ordinary course would constitute a miracle.

50. On the other hand, nothing is more remarkable in the operations of *life* than the tendency to vary within certain limits; and also to incompleteness; or even (as it seems to us) error, in carrying out the purpose toward which the efforts of life are directed. Of the myriad buds of spring, how few are able to mature their fruit, even if they have succeeded in opening their blossom. In how few specimens of the human race are the right and left halves of the body equally well developed. How numerous, both in the vegetable and animal creation, are all kinds of what we call malformations, serving no very manifest purpose of utility; and leaving to the theologian a large province in which to exercise his skill; or perhaps, I should rather say, his faith.

51: Into this province I do not propose to enter; but to demonstrate the irreconcilable diversity between the operations of life and those of chemical or other force.

#### *Analysis.*

52. Having pointed out some of the more obvious contrasts

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\* λείπεται τι ἔνδοξον.

between crystallization and life, I now proceed to an examination in further detail of the assertion that "just as by chemical analysis we learn the composition of calc spar, so by chemical analysis we ascertain the composition of living matter." In the first place it is to be observed that all chemical analysis, even all ultimate analysis, is not equally satisfactory. If by *analysis* we learn the composition of a body, and by *synthesis* can again form that body out of its elements, then we have a result that commends itself to the mind. In other cases it is not so; and the professed ultimate analysis is not worth the paper on which it is written. Molière's woodman, having practical acquaintance with his work, exclaims, "*Il y a fagots et fagots*;" much more may those who apply themselves to the subject matter in hand, admit that chemical analysis is greatly at a loss to give anything like a satisfactory account of the composition of albumen, for instance; and, further, that it fails altogether in its account of the composition of living matter. There is analysis and analysis! If any one has watched, under a good microscope, the motion of the different currents in the *Chara* or *Vallisneria*, or still more the beautiful phenomena of the circulation of the blood, he will be little disposed to value the gross and imperfect results of the best analysis the chemist can give of these same circulating fluids; in which analysis many things must be confounded, and (as in protoplasm and *Bathybius*) misdescribed under one common name.\*

53. I have myself found much silica, and that probably in a soluble state, in an analysis of the cambium† (which is the *protoplasm*) of an English tree, but I know not how to separate the formed from the unformed portion, and can therefore not certainly say to which of the two it belongs. I can only suppose that it was a very likely material for building the excessively delicate cell-structure.

54. I refer to M. Trécul,‡ for a beautiful illustration of renewed growth upon a decorticated stem of *Nyssa Angulisans*, showing how the renewed bark arises from the cambium.

55. Even the Abyssinian, who cut from the living animal his steak of *protoplasm*, knew how different its properties were from the same steak when cooked; and the philosopher, when supplied with eggs unboiled for breakfast, would not find his equanimity increased by the information that the difference between boiled and unboiled was in no way *material*, because it could not be detected by analysis.

\* See Appendix (B).

† See Appendix (C).

‡ *Annales des Sciences Nat. Bot.*, t. xvii. pl. 17.

56. In fact, we must needs complete that which our appliances leave so defective, by mental analysis; and, without *proof*, but with probability, decide that even in the simple processes described, we have altered the composition of every molecule of matter in (for example) the oleaginous matter and the albumen of the egg.

57. When we take albumen, subject it to heat and distil off the water, we have no longer in reality *albumen* plus *water*. That which is left is a horny substance, incapable by all our art of so taking up again the water into its composition as to become what it was before.

58. I deny, then, that ultimate analysis can give us in all cases satisfactory information as to the character even of non-living bodies.

59. The denial becomes much stronger when applied to living bodies. To prove this in detail would demand a treatise; but I think it may be made sufficiently apparent by a few considerations.

60. All living beings are composed essentially\* of four chemical elements, carbon, hydrogen, oxygen, and nitrogen, which are combined in various proportions.

61. But chemical affinity and vital affinity are *opposed* the one to the other, and on this point of such fundamental importance chemistry fails to afford us the requisite information; for it does not dispel the darkness that is around us. To formalize the matter thus: Let C be Carbon, H Hydrogen, O Oxygen, N Nitrogen, ♀ Life; † then

C. H. O. N. + ♀ = organized beings

C. H. O. N. - ♀ = products of decomposition.

62. What then is this "Life" on which so much depends, and concerning which ultimate analysis gives us no information?

63. If we look at the difference between the impregnated and the non-impregnated egg, we find that ultimate analysis fails to discern the slightest difference; yet in the latter case we have animal substances, destitute of the principle of life, hastening to resolve themselves into the products of decomposition. In the former we have *in posse* all the wonderful organization of the fowl attached to the as yet apparently unchanged matter of the egg.

64. Then when we allow our minds to grasp the vast and almost illimitable variety of creatures which spring from an

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\* Neglecting accessory ingredients. † The Egyptian symbol of life.

egg,—and consider that all these to the chemist, are, so to speak, alike,—we learn how very limited, after all, his powers of analysis are.

### *The Cell.*

65. A great deal has been said and written connecting the *cell*, in some mysterious manner, with the beginnings of life. The *cell-wall*, however, is that which constitutes the *cell*; and this no more represents to us that which is going on inside, than the walls of a council-chamber (*Cella*) could report to us the important deliberations carried on within. We want, in either case, to understand that which is at work in the interior; the destinies of nations depending on the latter; in the former the formative idea working from the unseen to the seen, and sketching out the outlines of the creature that is to be produced, to be afterwards elaborated in detail after its kind.

### *The Egg.*

66. According to Balbiani (as quoted in a work from which I extract the following details), the egg of some creatures (*Spirostomum*, *Stentor*) is a *mere cell*, without any other sign of the characteristic nucleus-like vesicle, the so-called *germinal vesicle*, than a clear spot in the midst of the yolk granules. In some cases, as in the *Amæba*, the parent of the egg is as simple in structure as the egg itself; and yet this most simply organized creature possesses *will* to determine its actions, and some sort of *sense* to guide its pursuit of food, as well as *power* to seize its prey and to assimilate this when apprehended; so that connected with that simple cell which forms its egg may be wonders past our finding out.

67. Even Dr. Huxley seems to give up the old notions of cell-formation, and in a beautiful description which I shall immediately give, shows that the *commencement* of formation may be in a "*structureless*" sac.\* Dr. Lionel Beale assures us that germinal matter is not unfrequently entirely destitute of *nuclei*,† but these bodies sometimes make their appearance if the mass be more freely supplied with nutrient matter. So far from nuclei being formed first and the other elements of the cell deposited around them, they make their appearance in the substance of a *pre-existing* mass of germinal matter, and become new centres of formation.

\* Appendix (D).

† *Protoplasm*, p. 45.

68. In the same manner, as it seems to me, spiral and reticulate vessels arise in the lax tissue of vegetable growth and become the determinative and formative element of new structure, as we shall see further on.

69. I copy the following admirable description from Professor Huxley\* (not being myself an anatomist):—"Examine the recently-laid egg of some common animal, such as a salamander or a newt. It is a minute spheroid, in which the best microscope will reveal nothing but a structureless sac, enclosing a glairy fluid holding granules in suspension. But strange possibilities *lie dormant in that semifluid globule*. Let a moderate supply of warmth reach its watery cradle, and the plastic matter undergoes changes so rapid and yet so steady and *purpose-like* in their succession, that one can only compare them to those operated by a *skilful modeller* upon a formless lump of clay. *As with an invisible trowel*, the mass is divided and subdivided into smaller and smaller portions, until it is reduced to an aggregation of granules not too large to build withal the finest fabrics of the nascent organism. And, then, it is *as if a delicate finger* traced out the line to be occupied by the spinal column, and moulded the contour of the body; pinching up the head at one end, and the tail at the other, and *fashioning flank and limb* into due salamandrine proportions, in *so artistic a way*, that after watching the process hour by hour, one is almost involuntarily possessed by the notion, that some more subtle aid to vision would show the hidden artist, with his plan before him, striving with skilful manipulation to complete his work."

70. The following sketches, copied from *Mind in Nature*, † will illustrate the gradual accumulation of the albuminous particles round what must be an electric pole, whilst at the opposite pole the oleaginous matter assumes a peculiar kind of refraction.

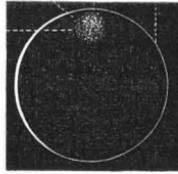


\* Huxley's *Origin of Species*.

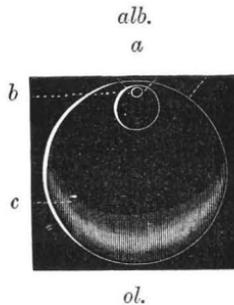
† *Mind in Nature; or, the Origin of Life, and the Mode of Development of Animals*. By Henry James Clark, A.B., B.S., &c. &c. New York, 1856.

71. The egg in its inception is a minute aggregation of *fluid* matter ; but this drop of fluid has not a homogeneous, uniform density throughout, but makes its first appearance in the form of an *indefinitely bounded* globule with a greater degree of transparency on one side than the other.

72. Soon, and whilst the egg is yet minute, the albumen becomes concentrated and assumes a somewhat globular outline. At the same time a condensation takes place at one side.



73. The aim of all these processes becomes now rapidly apparent, for soon we find that the albumen has clearly become



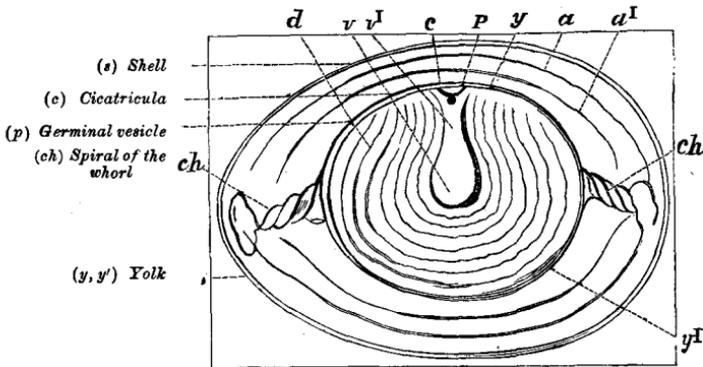
*a*, Germinal duct.  
*b*, Germinal vesicle.  
*c*, Yolk.

defined as a separate mass, apart from the yolk, and its superficies has become condensed into a well-marked envelope, which constitutes the *germinal vesicle* ; whilst the condensation going on within it at the last stage has resulted in the formation of a clearly-established agglomeration, with a distinct wall around it, called the *germinal spot*. Outside this field of operations, and antagonistic to it in character, the yolk has its peculiarities, its physiognomy, refraction, density, opacity, and colour, according to the kind of animal into which the egg develops, all tending to demonstrate that it is under a *different* formative influence

from that of the albumen, or, as we may say, at an opposite pole.

74. We may therefore define an egg, so far as chemistry can inform us, as a globular accretion of two kinds of fluids, *albumen* and *oil*, which are situated at opposite sides or poles.

75. I now present from the same source the perfect egg of a hen, (which has been boiled,) in section,—in which sketch will be distinguished the shell, the spirally-wound layers of the white (albumen) twisted into chords, which serve as axes, upon which



the yolk swings and revolves whenever the egg is rolled over, so as to keep the side with the white spot (*cicatricula*) uppermost, and nearest to the warmth of the hen.

76. It is impossible, even with prolonged boiling, to harden that part of the yolk (*v, v'*) which extends from the white spot to the centre.

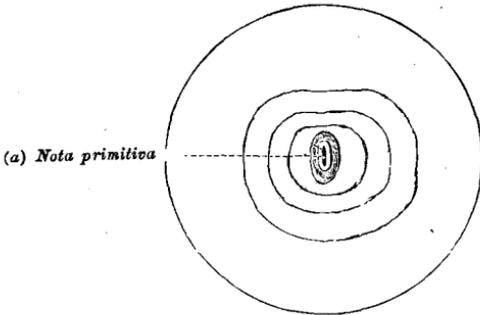
77. From Wagner's *Elements of Physiology* I take what seems to be in some respects a still better representation.\*

78. I think it unadvisable to do more than indicate from Wagner the *commencement* of the development of the perfect animal. Every one can follow up in thought the formation of the members of the perfect animal, "which in continuance were fashioned when as yet there was none of them."

79. Here, in the *nota primitiva*, or primary streak (*a*), is the first indication of the new being after twelve to fourteen hours' incubation. Another, from Cuvier's *Règne Animal*, shows the

\* This is omitted in printing the paper. The reader is referred to the original.

rudiments of the cerebro-spinal axis and of the vertebral column after thirty-six hours' incubation.



80. The outer circle represents the boundary of the yolk ; but I must fix attention on the central streak, which is destined to become the foundation of the living structure. All that we have been considering simply subserves the development of *this little streak*, and all is swallowed up in the course of its extension into the perfect chicken, and, as every one knows, nothing but the broken shell remains when *that* has emerged. All the rest has been simply predestined to subserve this purpose.

#### *Contrast.*

81. Now I would ask what resemblance can the most exalted scientific imagination detect between this and the aggregation of atom to atom, and of molecule to molecule, in crystallization ?

#### *Development.*

82. It would prolong to an unreasonable length, though it might strengthen the argument of this paper, to consider the further development of living creatures from the embryo ; but I hope I have made it quite evident that, in place of chemical affinities binding atom to atom and molecule to molecule, acting with mathematical precision, at inconceivably small distances and on particles of matter inconceivably minute, we have, before we can account for the phenomena of life, to find out the *formative power* ; \* which, working from the invisible, and being itself imponderable, can guide, control, coerce, or, if

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\* "En résumé, il existe dans tout le règne organique une *puissance formative*, qui, dans le règne végétal, agit principalement d'une manière symétrique, puis, en outre *conformément à un certain but*."—Link, Recherches

needful, hold in abeyance for a season all the ordinary forces with which we are acquainted. Wherever there is an *organism* there must be an *organizer*, and *this* working apparently according to a predestined design, capable of carrying out this design within certain limits of oscillation, able to sustain the structure to which it is attached or with which it is united, and to repair damages to a certain extent, varying according to the complexity of the structure; so that the starfish that has lost a ray does not produce a crab's claw in its place; nor does the lobster, in place of its lost claw, by any chance assume a human hand. In the very least organized creature—and they have been *measured* not larger than the thousandth part of a millimètre ( $\frac{1}{1000}$  of an inch)—the special organizer must have under its absolute control as many atoms of matter, it may be, as London contains of inhabitants; yet, while it holds sway, not one of these starts on an independent line. As soon as the creature *dies*, all this is reversed, and the chemical affinities resume their sway. The organizer is capable of assuming suitable matter to complete its organism, and this to any extent required, and also to provide for the continuance of this assimilation; so that every creature that we know of tends to an excessive reproduction; and the world would become too full if it were not that each creature (as it seems) has its special destroyer or destroyers. It is admirable with what *apparent* foresight and forecast this principle which we vaguely call *nature* works within ourselves, all unconsciously to ourselves; for if a bone is broken (for instance), the processes that are immediately set up to repair the mischief would certainly not be improved upon by consultation of the whole College of Surgeons. Yet what is it that practically adapts all this provident knowledge to our healing? Is it some "molecular machinery in our imaginations," or, as explained according to a *great* authority, "the poles of the atoms are arranged that tendency is given to their powers, so that, when the *poles and powers have free action and proper stimulus* in a suitable environment, they (the powers? or the poles?) determine first the germ and afterwards the complete organism?"\*

83. How much we are indebted to "*the powers*" and "*the poles*"!

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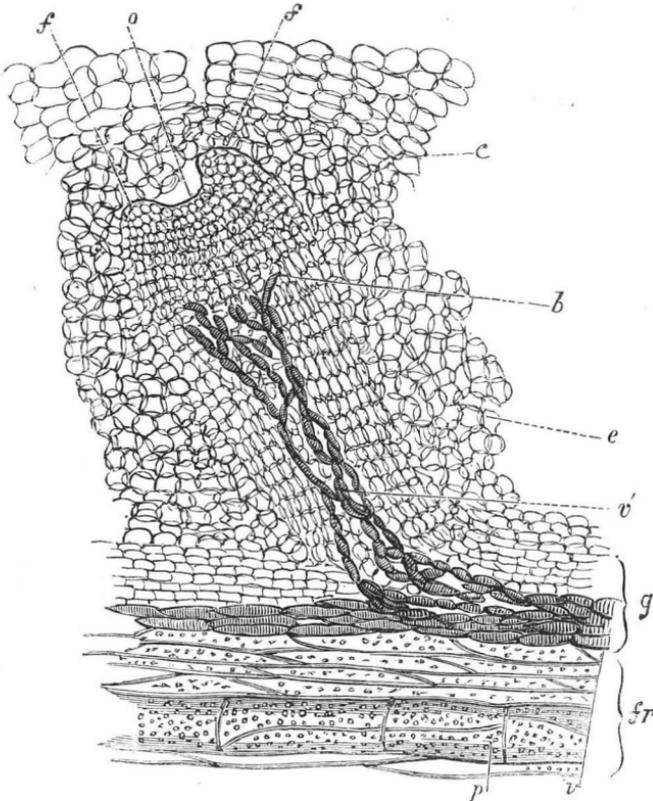
sur l'Accroissement végétal et la Greffe, *Ann. des Sciences Nat. Bot.*, t. xiv. p. 30.

"Les jeunes tissus végétaux, ceux de la couche génératrice en particulier, ont la propriété de se modifier, de se métamorphoser, pour produire tel ou tel organe dans telle ou telle situation, *suivant les besoins de la plante*."—Trécul, *Ann. des Sciences Naturelles*, t. xvii. p. 276.

\* Dr. Tyndall, quoted in *Life Theories*, p. 27.

84. I have shown in *The Quinology of the East Indian Plantations* the elaborate manner in which the bark is renewed by the cinchona plant, after having been removed for the purpose

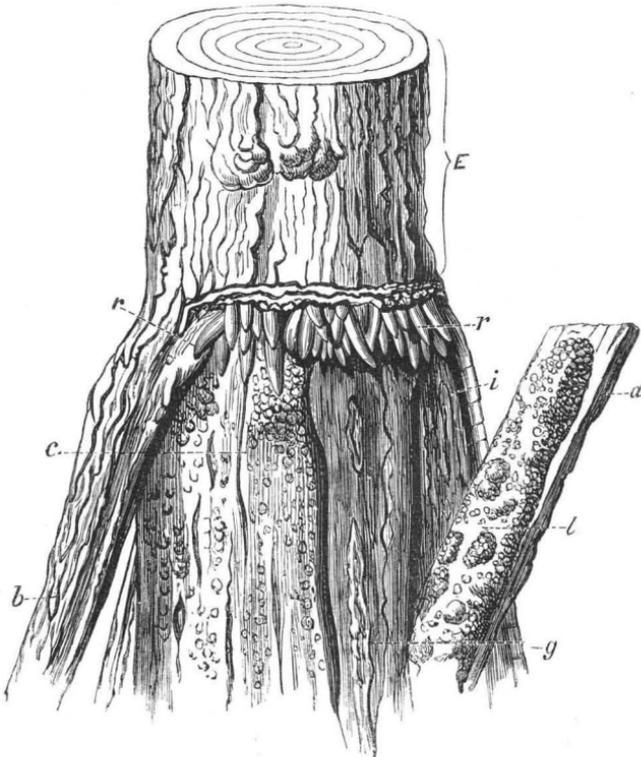
LONGITUDINAL SECTION of a fragment of a sucker of *Paulownia imperialis*, showing the structure of a *very young bud*: *fr*, a small portion of the fibro-vascular system of the root which produced the sucker; *p*, a punctuated vessel of this part; *g*, the generative layer; *c*, external cortical tissue; *e*, cellular protuberance, which proceeds from the internal cortical tissue, raises the external cortical tissue *c*, and in which is seen a very young bud *b*: the base of this bud is inserted in the generative layer *g* of the sucker; this bud is terminated by little projections *f*, which represent the first nascent leaves; vessels *v'* contiguous to those of the generative layer *v*, pass along its whole length, they are in relation with the lower part of the sucker.—(From the *Annales des Sciences Botaniques*, t. vii., viii. (1847), p. 291.)



Cortical tissue. Rudiments of the first leaves. Internal cortical tissue. Cells very small and faintly traced. Young bud forming. Extremity of the vessels. Couche génératrice. Fibro-vascular system.

of commerce. No female hand, in copying the most beautiful design of lace-work, could produce more exquisite elegance of structure than is apparent under the microscope, arising from

SECTION of the stem of an elm,\* from which plates of bark have been raised all round the tree, some from above downwards as at *a*, others in the contrary direction as at *b*. These strips of bark have remained adhering by one of their extremities either to the bark above *E*, or to the lower bark *E'*. At *g* the strips of bark have been removed in order to show better what has taken place during the experiment. From the upper surface of the wound have arisen numerous adventitious roots *r*. The strips of bark *a* and *b* have given rise to plates of bark, which attain one centimètre in thickness. They are clothed with new bark; the surface of the denuded wood has also produced thick layers of wood and of bark *c*. At the surface of the new productions *l*, plates of bark or of denuded wood have arisen from tubercles bearing each seven or eight adventitious buds.



*r r*, Adventitious roots thrown out as the result of decortication of an elm.

\* Trécul, *Annales des Sciences Naturelles Bot.*, t. xx. pl. 8.

that which at first seems but an exudation from the heart-wood of the tree—the only indispensable requisite being that the cambium\* or *living part*, should not have been removed, and that the surface should be protected from undue evaporation. We see how wonderfully nature “formifies” the part, adding by degrees that which is necessary, as the spiculæ or fibres; and “vacuolating” or forming channels for the conduct of the milk-sap of the plant. The spiral and reticular vessels are the first indication of the *intention* (so to speak) of the plant to throw out either branches or roots,† to find some means of replacing its loss; and the crystals, which are in no way the result of vegetation, but form after the bark is stripped from the tree, show the mathematically correct structure I have dwelt upon; so different from the free and varied forms resulting from life.‡

#### *Organism.*

85. In describing this, in the work cited, I have said “that I place no faith in any of the theories of vegetation which *isolate* the different parts of the plants; but I agree with Kant, in what seems to me a clear definition, that “the cause of the particular mode of existence of a living body resides in the whole,” and with Müller, from whose *Physiology* I quote, that “there is in living or organic matter a *principle constantly in action*, the operations of which are in *accordance with a rational plan*, so that the individual parts which it creates in the body are *adapted to the design of the whole*, and *this it is which distinguishes organism.*”

86. It is certainly to be desired that the words *organic* and *organize* should be carefully applied. It is difficult to understand in what sense they are used by some “thinkers” of the present era.

87. Hutton, in his day, suggested that the earth might be “considered as an organized body” “having a constitution in which the necessary decay of the machine is *naturally repaired*, in the *exertion of those productive powers by which it had been formed.*” This exercise of the philosophical imagination was scarcely appreciated by his contemporaries; perhaps it is reserved for our descendants to look upon the earth as *really* a living creature.

88. But what am I to make of the expression “*organic*

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\* Compare with the plates in the above volume, the cambium in Dr. Beale's *Life Theories*, plate II. fig. 1, the layer (c) “*containing bone-forming proplasts*, for an interesting analogy between vegetable and animal formation.

† Compare the diagrams in the preceding pages 197 and 198.

‡ See the work referred to, now in the Library of the Institute.

*crystal*” used in the following sentence? “Suppose that we had known nothing of the lobster but as an inert mass, an *organic crystal*, if I may use the expression.”\* It seems to me that the supposition could never be made by one who really understood chemistry, or could comprehend the difference between crystallization and life.

### *Conclusion.*

89. In concluding this paper, I must say that I am deeply impressed with the importance of recognizing the truth that life is a gift of the Almighty, to be regarded therefore as sacred to the Creator and Preserver, and neither to be communicated nor taken away but according to his laws.

90. There is an irreconcilable opposition, a total contrariety between this doctrine, which lies at the foundation of all civil society, and the religion of M. Comte,† which would wholly subvert the existing order of things. The adherents of Positivism and the disciples of Darwin are sufficiently outspoken on these subjects. It would be most unjust to Professor Huxley to represent him as advocating the errors of M. Comte, against which he has written with his usual force of argument. In one respect he seems to acknowledge the influence of his writings, in his sympathy with those who have been impelled by him to “think deeply upon social problems and to *strive nobly for social regeneration.*”‡ It is just here that the danger lies; for the more people are impelled to regenerate society, without having anything definite in their own creed, the more mischief will ensue from their endeavours. Professor Huxley describes himself as “one whose boat has broken away from the old moorings,” and who had been content “to lay out an anchor by the stern until daylight should break and the fog clear.” He seems by his quotation-marks to allude to the shipwreck at Melita; and if so, would do well to remember that on that occasion it was in consequence of *listening to an apostle* that they all escaped safe to land. Would that a like regard to authorized *testimony*, and a like happy result, might in his case be the termination of a state which must be trying to the patience even of a philosopher. One thing is clear, that it is a position which the multitude of mankind would never consent to occupy.

91. I hope that the study of these subjects will result in increasing perception of the above; and of the impossibility of compromise between truth and error on such fundamental

\* *Lay Sermons*, p. 106.

† See Appendix (D).

‡ *Lay Sermons, &c.*, p. 173.

points. It is a subject of congratulation and thankfulness that so many of the clergy have arrayed themselves under the banners of THE VICTORIA INSTITUTE ;—thus to promote that which has been said to be a peculiar advantage possessed alone by the Roman Catholic clergy, that “the *heresies of the day are explained to them by their professors of philosophy and science, and they are taught how these heresies are to be met.*”\*

92. Professor Huxley desires to supplement the deficient instruction of the people by “Sunday evening addresses upon non-theological subjects;” and would “like to see a scientific Sunday school in every parish, not for the purpose of superseding any existing means of teaching the people the *things that are good for them*, but side by side with them.”

93. I do not at all intimate that Dr. Huxley would wish the people instructed either in Comtism or in Communism; but as the Professor holds a distinguished post in “the Royal Commission on Scientific Instruction and the Advancement of Science,” and as the above idea of *scientific instruction for the masses* has taken deep hold in many quarters, I insist on the necessity that exists for first of all distinguishing between true and false science, and of exploding the *false* whilst we adhere to the *true*.

94. Let any person of common sense decide, what would be the effect of teaching children, *side by side*, the origin of life as stated in the Book of Genesis; and the notions of some men of science which we have been considering in this Paper.

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## A P P E N D I C E S.

(A.)

(From the *Edinburgh Review*, April, 1873, p. 5.)

“The practical influence of the new doctrine is seen in the rise and rapid growth of a pseudo-scientific sect—the sect of the Darwinian evolutionists. This sect is largely recruited from the crowd of facile minds ever ready to follow the newest fashion in art or science, in social or religious life, as accidents of association or influence may determine. . . .

“The evidence in favour of the central Darwinian doctrine is notoriously deficient, but this is no hindrance to its enthusiastic acceptance. Ardent

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\* Prof. Huxley's Essay on *Scientific Education*, p. 62.

neophytes easily personify the principle of evolution, and clothe it in imagination with all the powers necessary for the production of its reputed effects. . . . On all doubtful points their subjective conviction is so strong as to be independent of objective verification or outward proof of any kind. . . .

“The cavils of sceptics are of no avail with the true evolutionist believer, because he has an unflinching trust in his own sacred books and inspired writers. At their bidding he is ready to adopt not only things unsupported by reason, things above and beyond reason, but things directly opposed to all reason, all probability, and all experience.

“Another note of sectarianism in the evolutionists is their tendency to intolerance. The tendency is manifested, perhaps, in its extremest form amongst the rank and file of the sect. It displays itself, however, in various shapes, some of which are amusing enough.

“This tendency to intolerance appears also in the writings of the school, especially in the less distinguished. The tone of the discussion in many cases involves the tacit assumption that the evolutionists are the only wise men, and wisdom itself will die with them. This feature comes strongly out in the journals of the school in the free use of such terms as ‘exploded’ and ‘extinct,’ applied to all opposing theories and rival views.”

(From the *Quarterly Review*, October, 1873, Art. *Herbert Spencer*,  
p. 537.)

“A passionate hatred of religion, however discreetly or astutely veiled, lies at the bottom of much of the popular metaphysical teaching now in vogue. *Delenda est Carthago!* No system is to be tolerated which will lead men to accept a personal God, moral responsibility, and a future state of rewards and punishments. Let these unwelcome truths be once eliminated, and no system is deemed undeserving of a candid, if not a sympathetic consideration; and *ceteris paribus*, that system which excludes them the most efficaciously becomes the most acceptable.”

(B.)

“Qu'est ce que le Cambium? Grew, qui en a emprunté le nom et le sens aux médecins de son temps, n'y voyait qu'une *humour*. Duhamel y voit de plus une couche, et, d'après lui, les Allemands une couche de formation (*Bildungs-schicht*), d'accroissement, d'épaississement; Mirbel une couche génératrice ou régénératrice. Tout cela peut être vrai à la fois; si le cambium n'est pas un tissu, c'est l'origine d'un tissu, la matière d'un tissu ou des tissus. Comme cette matière enferme incontestablement de la sève, je l'appellerai *matière séveuse*, pour n'affirmer rien que ce que nous en voyons.”  
—Guillard, “Sur les Mouvements et les Lieux spéciaux de la Sève.”

*Bul. de la Soc. Botanique de France*, 1867, p. 67.

(C.)

(From *The Depths of the Sea*, by C. W. Thomson, LL.D., &c., Regius Professor of Natural History in the University of Edinburgh, &c.)

"I feel by no means satisfied that *bathybius* is the permanent form of any distinct living being. It has seemed to me that different samples have been different in appearance and consistence; and although there is nothing at all improbable in the abundance of a very simple shell-less '*moner*' at the bottom of the sea, I think it not impossible that a great deal of the '*bathybius*'—that is to say, the formless protoplasm which we find at great depths—may be a kind of *mycelium*, a formless condition connected either with the growth or with the decay of many different things." (p. 415.)

"The German naturalists of the new school, in their enthusiastic adoption of the Darwinian theory of evolution, naturally welcome in these '*moners*' the essential attribute of the *Urschleim*—an infinite capacity for improvement in every conceivable direction." (p. 409.)

How is it, then, that they are contented to remain *moners* still?

(D.)

The same apparently "structureless" character distinguishes the bud.

"Le bourgeon, soit libre (embryon), soit fixe, n'est d'abord qu'une petite masse homogène, un globule de matière séveuse, où n'existe formellement aucun des organes qui un jour auront leurs fonctions spéciales dans la plante. Sur le pourtour de ce globule, émergent bientôt les feuilles, d'abord dans la même simplicité d'organisation. Puis à mesure que ces feuilles rudimentaires grandissent, un courant séveux se détermine, se dessine dans chacune d'elles; et après lui, des courans latéraux, qui aboutissent à ce courant dorsal; celui-ci se prolonge lui-même dans le globule qui est la base commune de ces rudiments de feuilles."—*Bul. de la Soc. Botanique de France*, 1867, p. 70.

(E.)

(From the *Gazette des Tribunaux* for March 2, 1870.)

The affairs of M. Comte came into the French law courts after his death. I extract the following particulars, evidently authentic, from the speech of M. Griolet, *avocat* of Madame Comte:—

"M. Auguste Comte, who is now celebrated as the founder of a new system of philosophy, the *positive* philosophy, died at Paris, in the month of September, 1857. . . . M. Comte has himself divided his life into two epochs, and his work into two parts. During the first of these eras he filled, with distinction, different posts in the *École Polytechnique*; he created and

developed a new system of philosophy. In the second he lived, having separated from his wife, 'en communion objective et puis subjective' (to employ his own expressions) with a young woman, Madame Clotilde de Vault ; he created a new religion, the religion of humanity ; he constituted himself the chief priest of this doctrine, which he expected *shortly* to govern the religious, political, and social destinies of the world.\*

He also made the will which was called in question by his wife, on the ground of alleged insanity, in the which he outrages his wife,† and makes singular disposition of his effects.

His taking up with the wife of a banished convict (after he had separated from his own) is thus described :—"It was at this time that he met a young woman, who had come to Paris to publish some literary essays. She (Madame de Vault) was married, but her husband was separated from her by a sentence ‡ of an afflictive and dishonouring character. M. Comte, who was then 47 years old, conceived for this woman the strangest passion. They became together godfather and godmother of a child, and M. Comte thought that their union had been consecrated by this ceremony. Madame Clotilde de Vault became seriously ill and died. But to these relations, of which M. Comte always attested the purity, he added a subjective union which never ceased. It is Clotilde de Vault who, from that time, *inspires all his thoughts*, dictates all his works, directs all his acts. She is his eternal companion, his guardian angel, his *goddess*. She is even to become the *goddess of humanity*. Her worship will be united to the worship of humanity itself. 'Her image' he says, 'is destined to furnish to regenerate souls, the best emblem of the *Eternal Being*'" ! §

Such is the character of the inspiration before which that of prophets and apostles is to fade away. Such the character of the teacher of the new philosophy, who has had *some* success amongst his own countrymen, but "*in England* the success of M. Comte has been *greater*. He has, perhaps, fewer disciples, *but his ideas have penetrated more into English philosophy*, and the translation of his works has taken its place *in ordinary teaching*."

The "eternal companion" of the philosopher treated the poor despised wife with the jealousy of a "goddess" of the old mythology. She could not suffer the rivalry (*concours*) of the legitimate wife. This last was then banished and forsworn. She becomes in all his works, "l'indigne épouse," although, to her careful nursing he had, at an earlier period, owed his life and reason. It is well to look these things in the face before we intrust to *our* philosophers the place they contend for as teachers of the rising generation.

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\* *At present* it would be impossible to present to an English reader the speculations suggested in the above. See tome iv. pp. 33, 320, *Système de Politique Positive*.

† "Outragée dans la manière la plus grave."

‡ "Une condamnation afflictive et infamante."

§ "Le meilleur emblème du Grand Etre."

The CHAIRMAN.—I am sure we must all with acclamation return our thanks to Mr. Howard for his very able and excellent paper. In commencing the discussion, it may perhaps be agreeable to you that I should point out one or two of the palpable fallacies which have been put forward in support of the doctrine so admirably controverted in this paper—namely, that there is a strict analogy between the inorganic processes, such as the formation of a crystal, and the organic processes, such as the formation of a living being. On one occasion, at a meeting of the British Association, I remember a lecture was addressed to the working men of Dundee, and I could not help thinking what a pity it was that so false an analogy should be specially addressed to the working men of one of the great centres of Scotch industry, who were so little capable of recognizing the very limited extent of the analogy placed before them. Professor Tyndall, who gave the lecture, called attention to the resemblance to the formation of what we may call fern-like leaves, by what is commonly known as the production of the zinc-tree or the lead-tree. If you place a solution of sugar of lead in a bottle and hang a little ball of zinc at the top of the bottle, and wait a certain time, beautiful leaf-like formations will take place, which in fact result from the acetic acid of the sugar of lead taking up the zinc and setting free the lead. The lead forms thin laminated crystals, which are thrown out, and are very fern-like in appearance. The argument of the lecturer was that just as this action produces fern-like branches, so the real ferns are produced by analogous means. But there is a fundamental error underlying this proposition. It is simply this: that under whatever circumstances and from whatever source you derive it, exactly the same form takes place in the crystallization of lead, or the crystallization of silver, or of any other substance. If you re-dissolve it exactly the same thing may again take place, whereas in the formation of plants we know that the same elements of carbon, hydrogen, oxygen, and more or less of nitrogen, with portions of lime and silica, meet as air, water, and earth, and form these plants, but do they always form the same? No, certainly not. The individual plant formed depends on the influence of the pre-existing germ derived from another organism of the same kind, which determines the particular mode of combination of the inorganic element, so as to form an individual similar to that from which the germ was derived: *there* is the essential difference. You have the same elements producing every variety of plant from the soil and the air according to the influence of the seed—that is, of a germ derived from a similar organism, whereas in the simple inorganic formation of a crystal you have exactly the same crystal formed from whatever source you derive the crystallizing element. Another error of the same kind, and what was more subtle, was put forward in a work by Professor Tyndall, called “Fragments of Science for Unscientific People,” in which he refers to polarized light. It is well known that if you take a section of crystallized carbonate of lime in a direction perpendicular to the axis of the crystal, and expose it to the action of a polarized ray, you have a series of rings with a black cross. If you take certain organic elements, such as particles of arrow-root or starch-grains, and examine them under polarized

light, you will see a black cross produced in the granules—produced in the passage of this light through these granules. The Professor then goes on to say that just as the black cross results from the crystallization of the calcite, so the black cross results from the organic formation to which he alludes. But the two things are totally different, which he ought very well to know, and rest on totally different grounds. The effects manifested by the passage of polarized light through a crystal are invariably the same from whatever source the crystal is derived, and if you have a mass, and take the smallest portion of any part of that mass, you will find that exactly the same effects are produced by the transmission of polarized light. The molecules of which it is composed are arranged in a certain definite order in the way in which Mr. Howard has happily shown in the early part of his paper, whereas in starch-grains the case is totally different. The action of polarized light on starch-grains results entirely from their being in a state of strain, and any inorganic substance which is in a condition of strain will exhibit certain effects in a polarized ray. Now any organic substance, such as horn, or a great many other substances when perfectly dry, desiccated as starch granules are, and which in the process of desiccation have undergone a certain amount of molecular strain, show under that condition of strain a peculiar action on polarized light. Just the same thing takes place with a piece of unannealed glass. Unannealed glass is very readily broken by the action of heat, or any mechanical disturbance of its molecules. Take, for instance, Rupert's drops, small pieces of glass suddenly cooled by being dropped into water. The exterior is more rapidly cooled than the interior, and a contraction is produced which occasions a strain on the interior molecules. So if you take a piece of unannealed glass you will find, on submitting it to the action of a polarized ray, that you will have a black cross. But it is far from corresponding with the crystal, whereas if the piece of glass were a crystal of calcite, every part of it would present exactly the same character under the action of polarized light. But whereas in a piece of unannealed glass it results from a strain, if you cut off the sides of a circle and reduce them to a square you will have very different figures produced. So if you take a circle and scallop its circumference, you will then have a totally different figure produced, because in that case you have removed the external strain in rather a different manner. I think this is quite sufficient to explain to you that the analogy is a totally false one, and that it is not true that just as the black cross is in the one case so it is in the other, but that there are two somewhat similar results produced by totally different causes. I have brought this forward as one of the specious arguments which some men of science will put forward, I might almost say, in order to mislead the unwary. I hope that some of our friends will make some observations upon Mr. Howard's paper. It appears to me to be most important that the clearest and most intelligible conception should be given to the unscientific, as to the fundamental distinction that exists between the results of any mere molecular action, and organization which is the result of vitality. And it must always be borne in mind that whereas in the case of inorganic formation the

precisely same results follow from whatever source you derive the material ; in results determined by the existence of some germ or seed derived from a previously organized individual, and which determines the formation of a similar organism, there is an essential difference which is invariably found to exist between organic and inorganic force.

Mr. DAVID HOWARD, F.C.S.—There is one point I wish to call attention to, which I think may somewhat assist the very clear exposition we have in this paper ; that is, the curious way in which crystallization seems to touch life—always from below. In very many cases life produces crystallized bodies, but I think one may safely say it is merely the result of destruction, the result of waste, or of secretion ; it is after life that crystallization comes. Chemistry can do wonderful things in producing crystalline bodies. Take, for example, the acid of grapes. Till recently it was supposed to be purely the result of organized life, but chemists have shown that it may be produced from coal-gas. Now, though coal-gas is of organic origin, it is a lifeless thing, and the result is not the result of organic process. We never can produce the self-developing cell ; we never can produce the independent molecular action which we call life. As has been very clearly put, while the crystallization of any crystalline body is the same to the minutest point, however it may differ to the ordinary eye, the structure of an organic substance is very different. In the case of crystals, to mathematicians the variations of crystallization are simply modifications of the same mathematical form, that may be produced with the most perfect accuracy from one to the other. It is wonderful to see a good crystallographer take a piece of a crystal and from that deduce the form of a perfect crystal. Even the smallest fragment is sufficient. But there is nothing like that in life. The same general form is seen to recur in living organisms, but there is no absolute mathematical identity. The more one studies crystallography, and sees the extreme simplicity of forms and the extreme richness of the developments of life, the more marked the difference becomes. Great as the triumphs of modern chemistry are, there is no way of infringing the boundaries of life between organic and inorganic matters, but they are left even more marked. Whatever the distinction between life and want of life, between life and inanimate nature, it is even more forcibly marked now than ever.

The Rev. R. THORNTON, D.D.—I think it would be a great pity that we should not get all we can out of Mr. Howard ; I am therefore going to ask a question which I have no doubt he will be able and willing to answer. I wish him to tell us his opinion about the experiments of Dr. Bastian. I was somewhat surprised at the paper read by that gentleman at the meeting of the British Association in 1871, on the "Formation of Bacteria in Animal Fluids." His statement was that these fluids were placed in glass tubes which were hermetically sealed, and then exposed to the light of the sun or to heat, when it was invariably found that bacteria had been formed. We must remember that the theory of Sir Wm. Thompson had not then been given to the world, and Dr. Bastian was evidently unacquainted with it. He stated that he had repeated his experiments again and again, and in every case

these phenomena appeared. I myself entertain very strongly the view of Mr. Howard, that life is essentially distinct from any mechanical crystallizing force; but I was rather puzzled by the statements of Dr. Bastian, and my judgment has been somewhat in suspense as to this theory of the formation of a lower order of animal and vegetable life in fluids. I hope that Mr. Howard, in his reply, will say a few words on the subject.

MR. W. MELMOTH WALTERS.—I am also anxious to ask a question. Is not the difficulty of *comparing* crystallization with life one of our great difficulties here? In the case of crystallization we are able to analyze the substance thoroughly, but in that of life we are absolutely unable to analyze what life is. When we get to that germ there is a failure of analyzation, and therefore the comparison between the two is not complete. In the one case we are able to analyze all the parts, and to know exactly the mechanical motions that bring them together; but in the other, we have no power of analyzing the actual motive power of the whole, which is the vital spark. Therefore there is no parallel between the two cases.

MR. J. E. HOWARD.—I shall be very happy to do what I can to answer the questions which have been put to me. The subject of biogenesis forms the title of a long paper in the "Critiques and Addresses" of Professor Huxley, and I cannot do better than refer Dr. Thornton to the passage\* in which he sums up the long chain of evidence on the subject. Dr. Huxley shows very clearly, as he is well able to do when he takes a subject in hand, the deficiency of the experiments seeming to favour the doctrine, and the excellence, on the other hand, of the researches of Pasteur who takes the opposite view. The experiments in question were directed to this end: by means of various contrivances which I cannot now attempt to explain in a moment, to secure that the air which entered certain flasks should be entirely filtered from all the germs which it ordinarily contains; it was provided that the water in the flasks should be boiled (although by the way that is not sufficient, because it has been found that boiling will not destroy all the germs), and then that this perfectly pure air and perfectly pure water should be left together, and if it could be shown that perfectly pure air and perfectly pure water left in contact for a certain length of time produced living creatures, we should of course have the proof of what is called *abiogenesis*, that is to say, spontaneous generation. This controversy has been carried on to a very great extent in France, and with exceeding patience and diligence of research, and it was committed, if I remember rightly, to a certain delegation of their most learned men to decide. Pasteur completely came up to the mark with his experiments, and showed that life was not produced under these circumstances. Those who took the opposite view, I believe I may say, shirked the question. I appeal to our chairman whether that was not so.

The CHAIRMAN.—Quite so.

MR. HOWARD.—Dr. Bastian takes the same line of view as these latter

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\* Critiques and Addresses, p. 236.

gentlemen, and the controversy has been carried on by other distinguished investigators in Germany and England. The question may still be said to be upon the *tapis* in this country and perhaps in France. I can only sum it up in the way I have in this paper, that the notion of *abiogenesis* is driven as near to the vanishing point as possible. I may refer to our chairman that the tendency of the proof is against spontaneous generation. As regards what has been said by Mr. Walters, I can only say that I entirely concur with his statement of the impossibility of analyzing "the vital spark;" but the contrast between life and crystallization is greater than his remarks would seem to imply.

The CHAIRMAN.—On the subject of *abiogenesis*—that is the formation of life without previous existing life—the question is simply this. No one doubts that myriads of invisible germs of organic life are constantly floating about in the atmosphere, so minute as not to be detected; and in regard to the experiments of Dr. Bastian and others who take his view, it would appear that certain fluids are prepared which contain the elements of low organized beings, such as those called bacteria and vibriones, or contain the elements of which these animals exist, so mixed up as to be peculiarly liable to develop such a formation. The simple fact seems to be this; if you take these fluids and only take sufficient precautions to exclude the possibility of the entrance of germs, you will have no organization following, and no organized beings produced. I remember hearing a paper read at the Royal Society a short time ago, where Dr. Bastian's experiments were repeated by another professor, whose name I cannot at the present moment remember. He took elaborate precautions to prevent the possibility of any germs being present in the fluid placed in the vessels or in the air which overlaid the fluid. He took precautions which appeared to be sufficient to exclude the possibility of any germs being present. The air was passed through strong acids which would entirely destroy organic life, and the fluid was subjected to such conditions as it appears to me must have excluded any germs. And also the vessel itself, for these germs are so minute that in the ordinary washing or wiping of the vessel multitudes of them might be left behind, adhering to the surface of the glass, and which no mechanical wiping could remove. The simple result was this: wherever sufficient precautions are taken in the conduct of the experiments to prevent the admission of germs,—the fluid being introduced into a glass tube, and then hermetically sealed, so that there is no access of external air or of germs from any external sources,—the fluid will remain week after week, and month after month, without developing any organization whatever; but break the end of the tube and allow a little air in, and in the course of twenty-fours you will have, after this tube has been stationary for months without any change, multitudes of these low organized beings in it. They can only be introduced by means of germs contained in the air, and introduced into the tube when it was broken, and the external air allowed to enter it. From the recent experiments of Dr. Burdon Sanderson, the result is clear that if you take sufficient care to prevent the admission of germs into the fluids, no

organization whatever takes place. As to boiling the water, it is a remarkable fact that some of these germs do not seem to be destroyed by raising the fluid to the boiling point, but if you raise it to ten or fifteen degrees Fahrenheit above the boiling point, they are destroyed. At one time it was supposed that boiling would be a sufficient means of destroying the vitality of all germs that might exist in the fluid, but that is not so. It requires a higher temperature. But if you take sufficient pains to destroy or exclude all germs, no organization will ever take place. That is, I believe, the simple state of the case.

Mr. HOWARD.—I entirely concur in the views of the chairman, which have been much better expressed than I could have succeeded in doing.

The CHAIRMAN.—Of course this is a very vital point in the discussion of a very important subject. It is one which I have carefully considered, and upon which I have made myself acquainted with all the facts; because if you once grant the formation of one of the simplest of these bodies—these little monads—these particles of organized nature, by the mere action of inorganic forces, and grant the theory of successive development, then you may go on to something higher, then you get to mollusca, and then, according to the Darwinian theory, you may get up to man, and step by step you supersede the necessity of a Creator. That is the gist of the whole argument, and therefore the fundamental point—namely, the possibility or the impossibility of the formation of any, however lowly organized being, without the influence of a pre-existing germ. If you once admit that, all the rest follows as a necessary sequence. That is the foundation of all we feel bound to support.

Mr. NEWTON.—And hence the importance of Mr. Howard's paper.

The CHAIRMAN.—Exactly.

The Meeting then adjourned.

## ORDINARY MEETING,\* FEBRUARY 16TH, 1874.

C. BROOKE, ESQ., F.R.S., VICE-PRESIDENT, IN THE CHAIR.

The Minutes of the last Meeting were read and confirmed, and the following Elections were announced :—

ASSOCIATES :—Rev. J. M. H. Du Pontet de la Harpe, B.D., Pastor of the Frnch Evangelical Church, 16, Kildare Gardens ; Nicholas Whitley, C.E., F.M.S., Penarth, Truro.

Also, the presentation of the following Works to the Library :—

- “Proceedings of the Royal Society.” Part 149. *From the Society.*  
 “Proceedings of the Smithsonian Institute for 1871.” *From the Institute.*  
 “Revelation and Science.” By the Rev. P. Onslow.  
*From the Rev. I. G. Smith, D.D.*  
 “Duration of Future Punishments.” By Rev. J. Constable.  
*From L. Biden, Esq.*  
 “Hades.” By the same. *Ditto.*  
 “L’Architecture du Monde des Atomes.” *From J. E. Howard, Esq.*  
 “Bach’s Answer to Davison on the Johannian Gospel.”

The following Paper was then read by the Author :—

*THE BRIXHAM CAVERN AND ITS TESTIMONY TO THE ANTIQUITY OF MAN;—EXAMINED.* By N. WHITLEY, Esq., C.E., Hon. Sec. of the Royal Institution of Cornwall.

**T**HERE are two lines of speculative scientific research recently promulgated by some few leading men of science, both of which aim at establishing the existence of man in times of remote antiquity. The theory of evolution, which professes to trace up man’s descent from the lowest form of marine life

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\* Specially an Ordinary Meeting.

through higher and yet more highly organized beings, to the "man-like apes," and from them across an unmeasured and unmeasurable gulf to man in his lowest estate as a bestial savage. The other theory attempts to trace intellectual man backwards through successive stages of degradation and savagery to the "first being worthy of being called a man." At this point these two lines of research meet: they are supposed mutually to support each other, and the origin of man is thus assumed to be accounted for.

The discovery of a new and intact Bone-cave at Windmill Hill, Brixham, in 1858, is said to have given a great impulse to these theories of man's origin, and it was decided to have a thorough and systematic examination of its contents. The Royal Society made two grants of one hundred pounds each towards defraying the expenses, on condition that the relics discovered should be deposited for inspection in the British Museum;\* "a committee of geologists was charged with the investigations, amongst whom Mr. Prestwich and Dr. Falconer took an active part, visiting Torquay while the excavations were in progress under the superintendence of Mr. Pengelly."†

The results of the exploration led Sir Charles Lyell to state, at the meeting of the British Association for the Advancement of Science in 1859, as follows:—"The facts recently brought to light during the systematic investigation of the Brixham Cave must, I think, have prepared you to admit that scepticism in regard to the cave evidence in favour of the antiquity of man had previously been pushed to an extreme."‡

And Mr. Prestwich, writing in the same year, says: "It was not until I had myself witnessed the conditions under which these flint implements had been found at Brixham that I became fully impressed with the validity of the doubts thrown on the previously prevailing opinions with respect to such remains in caves."§

Dr. Falconer appears to have been so convinced by the Brixham evidence that he specially visited Abbeville to inspect the so-called flint implements collected by Boucher de Perthes from the gravel-beds of the Valley of the Somme, whose discoveries had hitherto been ignored or treated with derision; and he was thus led to adopt the opinion that the Somme

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\* These relics are now, 1874, in the possession of the Geological Society.  
—ED.

† *Antiquity of Man* (1st ed. p. 98).

‡ *Report of British Association*, p. 93.

§ *Philosophical Transactions*, p. 280.

“hatchets” had really been fashioned by the hand of man, and he urged Mr. Prestwich by letter thoroughly to explore the geology of this valley. This he accomplished, in company with Mr. Evans, and the result of their survey led them also to believe that the chipped flints found in the gravel with the bones of the extinct animals were manufactured tools, and that man was, therefore, contemporaneous with the mammoth and other extinct mammalia.

Thus, Brixham Cave is said to have become famous as first furnishing the evidence which dispelled former doubts, stimulated future research, and prepared the way for the adoption of the opinions of that enthusiastic antiquary Boucher de Perthes, that some of the roughly-chipped flints of the drift-beds were fashioned by human hands.

So much stress has been laid on the evidence derived from the exploration of this cave—such strong statements were early put forward of the human manufacture of the exhumed flints—that I resolved to make a careful survey of this cavern, and of its surroundings, and to test the bearing of its evidence on the antiquity of man. Accordingly, I have lately visited the Cavern on three several occasions, made a ground-plan of its different chambers, examined the remaining portions of its beds, and the composition of the drifted gravel; and, in addition, made a searching survey of the geology of the neighbourhood: and further, through the courtesy of a Fellow of the Geological Society, I have had an opportunity of inspecting some of the exhumed bones and flints lodged in the Society’s rooms at Somerset House. The general result of my investigations tends to show; that all the facts of the case have not yet been made known; that some have been wrongly interpreted; that the so-called flint knives, on which the evidence of man’s presence rests, are simply subsoil flakes, and that there is no proof whatever that they are manufactured tools.

The Cavern itself (represented by the dark portions of the plan on page 215) has been naturally formed along the lines of the jointed structure of the limestone rock; this is not only obvious from an inspection of its interior, but it is found by the compass that the direction of the chambers within the cave corresponds with the course of the joints in the adjoining limestone quarry. These joints run nearly N. and S., and E. and W., by the compass, the variation being  $21^{\circ}$  west. These natural divisional planes have been eroded and enlarged by water to a width of from 4 to 8 feet, and in this manner the chambers of the cave have been formed, and there is no evidence and no pretence that man has in any manner excavated or modified any portion of it so as to render it fit for his habitation.

The deposits in the cave were as follows :—

- “ 1st. At the top, a layer of stalagmite, varying in thickness from one to fifteen inches, which sometimes contained bones, as a reindeer’s horn, and an entire humerus of the cave bear.
- “ 2nd. Next below, loam or bone-earth, of an ochreous-red colour, from one foot to fifteen feet in thickness.
- “ 3rd. At the bottom of all, gravel with many rounded pebbles in it, probed in many places to the depth of twenty feet, without its being pierced through, and as it was barren of fossils, left for the most part unremoved.” (*Ant. of Man*, 1st ed., p. 99.)

The more important bones of mammalia obtained from the bone-earth consisted of the mammoth, the woolly rhinoceros, the cave bear, the cave hyæna, the cave lion, the reindeer, a species of horse, ox, and several rodents.

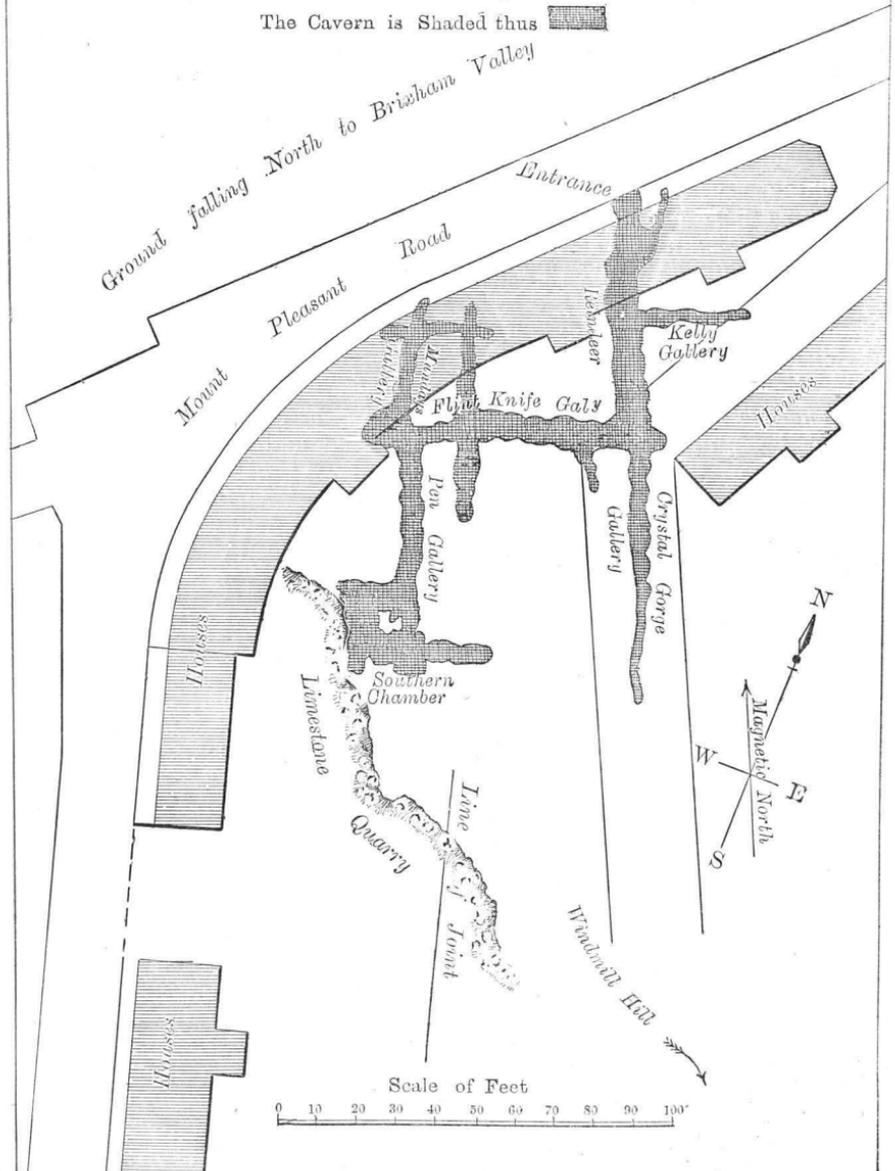
The evidence of the presence of man is founded on the assumed flint implements, and on these alone, which are thus described by Sir Charles Lyell :—“ No human bones were obtained anywhere during these excavations, but many flint knives, chiefly from the lowest part of the bone-earth ; and one of the most perfect lay at a depth of thirteen feet from the surface, and was covered by bone-earth of that thickness. From a similar position was taken one of those siliceous nuclei, or cores, from which flint flakes had been struck off on every side. Neglecting the less perfect specimens, some of which were met with even in the lowest gravel, about fifteen knives, recognized as being artificially formed by the most experienced antiquaries, were taken from the bone-earth, and usually from near the bottom. Such knives, considered apart from the associated mammalia, afford in themselves no safe criterion of antiquity, as they might belong to any part of the age of stone, similar tools being sometimes met with in tumuli posterior in date to the era of the introduction of bronze. But the anteriority of those at Brixham to the extinct animals is demonstrated not only by the occurrence at one point in overlying stalagmite of the bone of a cave bear, but also by the discovery at the same level in the bone-earth, and in close proximity to a very perfect tool, of the entire left hind leg of a cave bear.” (*Ant. of Man*, 1st ed., p. 100.)

Mr. Pengelly, F.R.S., gives a somewhat more detailed account of the relative position of the bones and the flint flakes. He says :—“ Upwards of thirty implements and flakes of flint were found ; the greater number in the cave-earth, and the rest in the gravel below. Not only were they all beneath the stalag-

# GROUND PLAN OF BRIXHAM CAVERN.

by N Whitley.

The Cavern is Shaded thus 



mitic floor, but they were all from nine inches to upwards of twenty feet below its nether surface; whilst nearly forty per cent. of all the bones met with in the Cavern were above the uppermost implement or flake. Taken as a whole, the implement zone was lower than that of the bones." (*The Ancient Cave-Men of Devonshire*, p. 5.)

From these descriptions it will be seen that the evidence of the presence of man rests only on the "flint knives," a flint core, and some imperfect flint flakes. Now it is obvious that the so-called knives are only ordinary flint-flakes, and Sir John Lubbock describes them as such in his account of this cavern;\* and he further says in explanation, "Flakes might be used as knives—they are indeed so named by some archæologists—but it seems to me more convenient to call them simply flakes." † But to call these splinters of flint from Brixham Cavern "flint knives," ‡ "flint implements," § "manufactured tools," § and "relics of man," || is to put words in the place of arguments, and to decide the vital point of the case by an assumption of authority, without even the shadow of any proof.

You will not fail also to observe that in the work entitled *The Geological Evidences of the Antiquity of Man*, no evidence whatever of a geological nature has been adduced as to the origin of the knives, but the burden of proof rests on an antiquarian fancy. Had geological evidence of the origin of the flints been sought, it would have been forthcoming, but thus far it has been either overlooked or ignored.

I have, however, made a searching investigation of the surface geology of the ground adjoining the Cavern, in the expectation of finding some clue which would lead me up to the source of at least some of its contents; and in this expectation I was not disappointed, for I found similar shattered flints in the section of the soil exposed in the low cliff on the east of Brixham harbour. On the top of the table-land of Berry Head, where the soil has been so weathered off that the bare limestone protrudes at the surface, from the crevices of the rock I gathered pebbles of drift gravel, flint flakes, and nodules of iron ore. The subsoil of Windmill Hill above the Cavern yielded me two typical flint cores showing the loss of flakes from their sides. Southward to Sharpham Point I obtained several flint flakes, and three feet under the surface of the soil I found *in situ* a very symmetrical "scraper." And sparingly scattered over the

\* *Pre-historic Times*, p. 260.

† *Antiquity of Man*, 1st ed., p. 100.

‡ *The Geologist*, vol. iv. p. 154.

† *Ibid.*, p. 67.

§ *Ibid.*, p. 101.

whole of this table-land is a trail of drift gravel composed of pebbles of quartz, trap, and hæmatite iron ore, which may be also traced down the slopes of the hill to the valley below.

Viewed from this new aspect of the case, it is highly probable that the flakes and the gravel of the Cavern have been derived from this trail of drift, and this probability becomes almost a matter of certainty when we consider that the flakes are associated with the same kind of gravel and nodules of iron ore, both on the outside and the inside of the Cavern.

I will further confirm this connection by an example easy of access, and open to daylight inspection. The limestone of the Hoe, the public promenade at Plymouth, is geologically the same as that of Brixham; at the south-east corner of the Hoe, near the flagstaff, it forms an inland cliff, where a fissure from one to three feet wide extends vertically the full height of the face of the cliff, which is about thirty feet. This fissure is filled to the top with loam and drift pebbles, and a trail of similar pebbles is found scattered over the surface of the rock above the cliff, showing an absolute connection between the drift gravel on the surface and in the fissure.

Thus we obtain the most complete evidence which the nature of the case admits, that the shattered flints found in the Brixham Cavern were derived from the trail of drift on the table-land above, and were washed into the Cavern with the loam and gravel in which they were found; and that the so-called "flint knives" are only subsoil flakes, which may be found by thousands scattered through the soil in various parts of Devon and Cornwall.

Here, however, a further question arises. What is the origin of these subsoil flakes? In a paper which this society did me the honour to reprint,\* I have shown that there is good evidence to prove that these flakes have been formed by natural causes, and that they can be traced backwards along the line of drift to the natural home of the flint in the chalk; and to the arguments there adduced I will only now add, that the relative proportion of flakes found in various caverns corresponds closely with their abundance or paucity in the adjoining districts. Thus in a cretaceous country, like that of the departments of the Dordogne and Charente, they are found by thousands in the caverns. In others, on the line of the flint drift, the flakes become scarce as the caverns are near to or removed from the influence of the drift. This point is well

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\* See *Journal of Transactions of the Victoria Institute*, vol. viii. p. 6.

illustrated in South Devon. In Kent's Cavern the flaked flints are numbered by hundreds, in Brixham Cavern by tens; and at Oreston, near Plymouth, where no flint drift has been found, no flakes have been obtained from the caverns. In Belgium, from one small cavern, thirty thousand such "implements" have been collected. What would be thought of the sanity of a man who, with a dining-room capable of seating only thirty guests, had provided a supply of thirty thousand knives.

The exploration of Brixham Cavern was commenced in 1858, and completed within one year, and shortly after the conclusiveness of the evidence proving the high antiquity of man, was affirmed and vouched for by names in the front rank of science; but the issue of the final report was unaccountably delayed for fifteen years, and during this period outsiders had no opportunity of testing for themselves the force of the evidence, and when an abstract of it appeared in the Proceedings of the Royal Society in 1872, it but feebly supported the strong statements which had been so early put forward, and which was founded solely on the "Fifteen Knives;" but in the final report these are only mentioned as the "so-called knives," and are included under the subdued terms of "flakes and splinters of flint."

"The Philosophical Transactions of the Royal Society" for the year 1873 contain the full report of the committee, and we here find the thirty-six specimens of flints classed and described in detail. They are thus classed by the reporter, Mr. Prestwich:—"Fifteen of which show unmistakable evidence of having been artificially worked." . . . "There are nine others of which the workmanship is very rude or doubtful, while there are seven which I think show no traces of having been worked at all. In the long interval since their discovery, four specimens have been mislaid."\* Nos. 6 and 8 are said to form one specimen, thus making up the full number of thirty-six. We may infer from this description that there is an evident passage in these roughly fractured flints, from that which is assumed to be a perfect implement into the flint broken by natural causes, and even the practised eye of the most accomplished geologist of the age fails to determine the difference between the flint said to be chipped by man, and the flint naturally broken.

A special examination of the flints by Mr. Evans is embodied in the Report. He says :† "Of the fragments of flint of various

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\* *Trans. of Royal Society*, vol. 163, p. 561.

† *Ibid.*, p. 549.

sizes discovered in the Brixham Cave, nearly all showing, in a greater or less degree, traces of human workmanship upon them, thirty-two have been submitted to me for examination." They are principally flakes, and must therefore include the fifteen flint knives, on which the evidence of man's presence has been so confidently founded. Omitting the fancied evidence of use and wear (afterward examined), they are thus described: "No. 1. Portion of a flake,  $2\frac{3}{4}$  inches long and  $1\frac{1}{4}$  wide." "No. 4. Broad, irregular-shaped flake,  $2\frac{3}{4}$  inches long, and in one part nearly 2 inches wide, but tapering to a rounded point." "No. 5. Broad-ended flake,  $2\frac{3}{4}$  inches long." "No. 11. Short fragment of a flake,  $1\frac{1}{4}$  inch long and 1 inch wide." "No. 12. Portion of a narrow flake, one edge of which has been lost." "No. 29. Fragment of a large broad flake, showing on its convex face a portion of the original crust of the flint." "? Broad flake,  $2\frac{1}{2}$  inches long and about  $1\frac{3}{8}$  wide, . . . a portion of the ridge at the butt-end removed, . . . one edge broken off, . . . and the flint itself broken into three pieces."\*

Such are the famous "Flint Knives" of Brixham Cavern. They are not only ordinary flakes, but from the description given of them by Mr. Evans, they appear to be the most imperfect, irregular, and fragmentary of their kind, and the judgment revolts from the inference that such contemptible fragments of flint could ever have been manufactured or used as tools by man. The evidence of such flakes breaks down from its utter weakness, and from its being unsupported by any "corroborative adjuncts," † Mr. Evans himself being the witness, for he has recorded his opinion of such testimony in these words:— "It is at all times difficult among a mass of flints to distinguish those flakes formed accidentally by natural causes from those which have been made by the hand of man; an experienced eye will indeed arrive at an approximately correct judgment; but from the causes I have mentioned mere flakes of flint, however analogous to what we know to have been made by human art, can never be accepted as conclusive evidence of the work of man, unless found in sufficient quantities, or under such circumstances, as to prove design in their formation by their number or position." ‡

Thus the facts brought to light by the final report fifteen years after the exploration reduce the evidence of Palæolithic man to the smallest possible proportions even to Palæolithic believers.

Coincident with the issue of the final report on the Cavern

\* *Trans. of Royal Society*, vol. 163, p. 549. † *Ibid.*, p. 565.

‡ *The Geologist*, vol. iv. p. 360.

by the Royal Society, which showed how slender was the evidence in support of the knives, an attempt has been made to supplement and strengthen it by the bold assertion that "*the whole of the flints*" (discovered in the cave) present "*signs of human workmanship or use upon them,*" and this is insisted on by Mr. Evans with every variation of language six times in a single page.\* Here, then, we have a definite issue to try, for whatever may be the form or rudeness of the implements, if they bear conclusive evidence of use by man, then they undoubtedly prove his contemporaneous existence.

In considering this new aspect of the case, it is important, first, to observe that the evidence of wear on implements now used by man is so plain and obvious that it cannot be mistaken;—a worn-out kitchen knife, a ground-down carpenter's axe, or a chisel used up to a stump—are all familiar things; and the same kind of worn and wasted evidence is stamped on the real flint tools of the Neolithic age. After a detailed review of the stone tools of Scandinavia, Nilsson says, "These facts show that the above-mentioned stone objects have been employed as tools in every-day use, and that they have, while being so used, become worn, resharpened, and broken, and that the fragments have been made into other kinds of tools."† And again he says, "We therefore learn that these axes have become blunted, have been reground and worn, until they were entirely worn out."‡

And still more closely to the point to be proved; some few flint flakes have been found which have been rubbed down smooth to a chisel-like edge at one end; and the Neolithic axes or chisels called celts are worn by rubbing or use to a working edge, and many are wasted in length, like a well-used plough-share: and this known evidence of use on authentic flint tools is so obvious that it cannot be mistaken.

But when we come to examine the nature of the evidence of use, now first put forward by Mr. Evans, we are taken aback to find that it is altogether of a different character, and that not a single flint from the Brixham Cavern bears the same indubitable marks of use as are found on the recognized stone tools of the Neolithic age. It is not even pretended that any such evidence of use is found on the Cavern flakes; but Mr. Evans proceeds by way of experiment to scrape the delicate edge of a flint flake over some hard substance such as bone, and the edge becomes broken and chipped,§ and applying this result to the splinters of flint in Brixham Cavern, he says:—

\* *Ancient Stone Implements*, p. 471. † *The Stone Age*, p. 90.  
 ‡ *The Stone Age*, p. 66. § *Ancient Stone Implements*, p. 458.

“One of these, two and three-quarters inches long, has been chipped or jagged along one edge, apparently by use, while the broad round end is so much worn away as almost to assume the appearance of a scraper. Most of them bear decided marks, either on their sides or ends, of having been in use as scraping tools.”\*

The answer to this kind of evidence is obvious and clear. The flakes struck off at a single blow by the flint-knappers of Brandon often show this jagged edge as the result of the natural fracture, and the side of a gun flint trimmed by one stroke of the hammer presents this appearance of minute chipping. Again, a flake carried forward in a *melée* of gravel, must have its delicate edge broken and chipped in places; most of the subsoil flakes are notched in this manner, and so are the thin edges of the roughly-broken flints found with them; indeed it is so obvious that the jagged edge is the result of natural causes, that MacEnery adduces this point as a mark of distinction between the *rubbed flakes* found in sepulchral urns in the Barrows, and the flakes from the Caverns; he says:—“None of the cavern blades appear to have been *rubbed* or polished, but exhibit *the rough serrated edge of the original fracture.*”†

This jagged edge of the flake naturally results from the manner in which flint fractures. When the conchoidal side of a flake is carefully examined under a glass, it will be seen that segmental wave-markings curve around the bulb of percussion, and, like the undulation of water from the fall of a stone, the crest of the wave is somewhat higher than the trough; and thus, as the wave runs out to the edge of the flake, the greater thickness and strength of the crest produces a point, and the trough forms a notch. It is, of course, only on some flakes that this effect can be observed, as other causes have operated to blunt or break their edges.

Thus, this newly-invented evidence of use is not only altogether different from that impressed on the recognized stone implements, but it is obviously the result of natural causes.

We have now to examine the evidence on which the great antiquity of the “flint knives” found in the gravel and loam of the Cavern has been attempted to be proved. On this point I will give the statement made by Mr. Pengelly at a joint meeting of the Archæological and Ethnological Societies, on the 19th of February, 1861. I quote from the *Geologist*, the editor of which says: “Mr. Pengelly made such very important remarks on the Brixham Cavern that we give his speech in full.” He said: “There was a remarkable circumstance con-

\* *Ancient Stone Implements*, p. 471.

† *Cavern Researches*, p. 70.

nected with some well-rolled and worn nodules of brown hæmatite iron mingled with the flints and bones. The greater part of the town of Brixham stands in a valley running nearly east and west, and about 300 feet wide at bottom. The hill on the north rises from the bottom at an angle of twenty degrees, and reaches the height of one hundred and thirty feet; this hill separates Brixham Valley from Torbay, and near its summit, on the northern or Torbay side, there is a large mass or deposit of brown hæmatite iron, *whence the nodules found in the cave were derived*. The southern hill, known as Windmill Hill, rises from the valley at an angle of twenty-eight degrees, and reaches the same height as the former. The Cavern is situated in the northern or Brixham side of this hill, ninety feet above the sea, and seventy feet above the bottom of the valley immediately below; therefore, if the valley was, at the time of the deposit of these bones, flint implements, and nodules, as deep as it is now, the hæmatite nodules must have crossed the valley at right angles to its length, first descending a slope of twenty degrees, and then ascending another of twenty-eight degrees, a gradient of nearly one in two, before they could have entered the Cavern. Hence it appears certain either that the valley could not then have existed, or that it had been filled up with gravel, which had since been cleared out. In either case the bones and flint implements would be of such great antiquity as is consistent with the subsequent reduction by natural causes of the valley to its present physical configuration.”\*

This elaborate argument, clear in its details and dogmatic in its assertions, is founded wholly on mistaken observation; it assumes that the hæmatite nodules found in the Cavern must have been derived from the northern hill, that the Brixham Valley has been excavated since their passage across the now eroded ground, and that the antiquity of man, the maker of the flint knives, must, therefore, be measured by the long period of time required for natural causes to excavate the valley seventy-five feet in depth.

This assumption is disproved by a more extended survey of the neighbourhood; for the nodules of iron ore are found scattered through the soil of the hill on the south of the valley as well as on the north; in fact, the largest bulk of iron ore lies on the south, it is so marked on the Ordnance geological map; it has for many years been worked in open excavations, the lease of the mine has been sold and resold at fabulous prices, and these iron nodules, with pebbles of quartz and trap, are

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\* *The Geologist*, vol. iv. p. 154.

scattered through the soil from Berry Head to Windmill Hill, and may be traced down the slopes of the hill to the valley below.

That these nodules of iron ore in the Cavern are thus a measure of the age of its deposits, and, by further inference, of the great antiquity of man, is opposed to all the surrounding geological evidence.

I have now shown that this Cavern is a natural fracture, unaltered and unused by man; that the celebrated "flint knives" are only ordinary subsoil flakes and splinters of flint, of the most fragmentary and imperfect character; and that similar shattered flints are found in the neighbouring soil; that the traces of human workmanship said to be impressed on the flints are altogether of a different character from that on the known flint tools of the Neolithic age; and that the argument in support of the antiquity of man, based on the presence of the iron nodules in the cave, is completely disproved by a more extended geological survey of the surface formations.

I have thus put facts against fancies—geological evidence against antiquarian assumptions; and I am justified in concluding that this Cavern furnishes no satisfactory evidence of the existence of Palæolithic man—no chronological scale by which to estimate the date of his early appearance.

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APOCRYPHAL RELICS OF MAN, SAID TO HAVE BEEN FOUND IN THE  
BRIXHAM CAVERN.

In his *Geological Evidences of the Antiquity of Man*, at page 100, Sir Charles Lyell mentions the finding, deep in the bone-earth, of "one of those siliceous nuclei, or cores, from which flint flakes had been struck off on every side"; leading to the inference that flint knives had been made in the Cavern. But, strangely, this important flint is in no way mentioned in the Report of the Committee. From the table, at page 494 of the Report, it does not appear to be one of the four missing flints. It is, therefore, very probable that this core forms one of the parts of the spear-shaped "implement" figured at page 550; and which is further perfected in form in the drawing by an imaginary line restoring about a fourth part of the butt end, assumed to be lost. If this be so, the piece of flint which has done duty as a rejected "core" the past fifteen years, is now elevated to the honour of being the chief part of a spear-head of the "Amiens type."

"The portion of a cylindrical pin, or rod of ivory," is a very apocryphal relic; it is first mentioned by Mr. Evans in his *Stone Implements*, page 471, without any indication as to the bed in which it was found; it is referred to in the Report only in a parenthesis in the same loose manner; and is dismissed by the reporter, Mr. Prestwich, with the suggestive remark, "The position of this is not certain" (p. 564).

The "remarkably symmetrical scraper," figured by Mr. Evans in *Stone Implements* (fig. 412), as being found in the Cavern, "has since been found to be a surface specimen placed amongst the others by mistake." (The Report, p. 551.)

The Chairman\* having conveyed the thanks of the meeting to Mr. Whitley,—

Mr. WHITLEY—who exhibited a collection of geological specimens to illustrate the paper—said, that for the last eight or ten years, as a civil engineer, he had had opportunities of observing shattered flints throughout the South of England, from the Scilly Islands to Norfolk, and from Belgium to the southern provinces of France. As to the flints which he now exhibited, some were from the subsoil, and some were struck off by Blake's stone-crusher, both sets, of course, consisting of selected specimens. The flints from the stone-crusher had received their present shape undesignedly and unintellectually, being crushed by simple pressure in Blake's machine, but from them it was very easy to pick out some admirable specimens of flint flakes, cores, scrapers, and knives; precisely similar to those subsoil "flint implements" said to have been formed by the hand of man. The flint flakes, some of which were beautiful examples of the so-called Palæolithic arrow-heads, were scattered by thousands over parts of Devonshire and Cornwall.

Mr. W. S. MITCHELL said it was easy to understand how flints would get fractured in a crushing-machine, but he wanted to know how the subsoil flints had become fractured.

Mr. WHITLEY said he was not able to say positively what power had produced the form in which the subsoil flints were found, but there could be no doubt that at one time England was as cold and icy a region as Greenland is now, and covered with an enormous mass of moving ice, which would exert even a greater force upon the stones beneath it, than the most powerful stone-crusher of modern times. It was remarkable that in the common land cultivated by the miners in Cornwall the same geological formation was found, and in the subsoil there was a layer of crushed quartz mixed up with the crushed flints. Now, no one would contend that the quartz was crushed by man, and it was evident that the same power which crushed the quartz had also crushed the flints. Of course he could not say what happened ten thousand years ago, but it was generally admitted that glacial action had crushed the stones on the surface of the earth.

Mr. MITCHELL still thought the operation of glacial action would be different from that of a stone-crusher. He supposed the stone-crusher acted by percussion?

Mr. WHITLEY said that was not so: the action of the stone-crusher arose from simple pressure, without percussion.

The CHAIRMAN remarked that the operation of the stone-crusher might be very aptly compared to the action of a moving glacier.

Mr. WHITLEY said that he had seen very good flakes produced by a cart-wheel travelling over a flint, and, of course, there was no sudden blow in that case: it was simple pressure without percussion. Some twenty years ago it

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\* C. Brooke, Esq., F.R.S., V.P.

was observed by Dr. Mantell, in the Isle of Wight, that most of the flints were crushed *in situ*, and he (Mr. Whitley) had himself taken out of a chalk-pit near Eastbourne, eight feet from the surface, a flint shattered *in situ*, which, when dug out, fell to pieces in his hand, and gave him three beautiful cores, which, looked as though flakes had been struck from off them.

The CHAIRMAN said the flint flakes were exceedingly different in character from the unquestionable flints of the Neolithic age. He had seen the finest collection of Neolithic flints in the world, at Copenhagen, where there were 600 or 700 hammer-heads and as many gouges and chisels of flint, the chisels having flat and the gouges curved edges, and there was also a collection of rounded stones which had evidently been used for sharpening the gouges; there could be no question that such implements had been made by the hand of man, but the stones which formed the subject of the present paper were of a totally different character.

Mr. J. T. FRAME mentioned that there was a very fine collection of stone implements exhibited at Salisbury, and along with them was a collection of modern flint implements manufactured by that clever imposter, "Flint Jack."

Mr. J. RENDALL mentioned that Sir Charles Lyell, in one of his books, quoted Professor Ramsay as saying, with reference to the flints found in France, that after twenty years' experience in such matters he was convinced they were manufactured by man. He (Mr. Rendall) was at a loss to know on what evidence that conclusion was formed.

Mr. WHITLEY said he had been three times to see the flints in the valley of the Somme, and the flint hatchets were so abundant that he brought away thirty in a hamper, and any one could get as many as he chose. It was certainly true that many of them were so symmetrical as to present an appearance of artificial work; but these could be traced down through every grade of form to that of rough gravel.

Mr. J. JEREMIAH wished to know if Mr. Whitley inferred an argument against the alleged antiquity of man, notwithstanding all the evidence hitherto published in favour of such a theory. As to the flint flakes, if they were not made by man, how came they to be so often accepted by scientific men as of human origin? Such flakes had been found along with the sculptured tusks and bones of animals. In Kent's Cave, where Mr. Pengelly had found a bone needle under stalagmite, there was a well-known boss which bore the date 1688, and when that was described in the last century, it was covered with a film of limestone, which film had not perceptibly increased in thickness since then. Assuming the date to have been incised in 1688, and the rate at which the limestone deposit accumulated so small, was it possible to doubt the great antiquity of man, when, beneath the floor of the cave, remains had been found which had been accepted by all archæologists as of human origin? Whether man was contemporaneous with the mammoth and the cave bear in this country or not, it appeared certain that he was in France.

Captain F. PETRIE said that, amongst others, Professor T. Rupert Jones, the editor of that valuable work on the Archæology and Palæontology of Southern

France, *Reliquiæ Aquitanicæ*, held that man was not coeval with those animals which were now more generally known to us by their fossils ; as to the rate at which stalagmite was formed, Mr. Evans, President of the Geological Society, had stated that "the rate of deposit of stalagmitic matter varies so much with different conditions, that its thickness affords no true criterion of the length of time during which it has accumulated."\* In Kent's Cavern the rate of the deposit of stony carbonate of lime—in other words, stalagmitic matter—had been very slow of late ; but this was under present conditions ; under others it might have been very rapid. For instance ; in the Carrara district, in Italy, the stalagmitic deposits were made a source of livelihood among the inhabitants, for the water was in many places so impregnated that any object upon which it fell became thickly coated in a fortnight, and the inhabitants formed brooches and other ornaments in this way.

Mr. WHITLEY said his paper only dealt with the things found in the Brixham Cavern, and not with what had been found in other caves. As to the rate at which stalagmitic matter was deposited, it varied so greatly, that in culverts which he had made he had seen stalagmite formed an inch in thickness and stalactites six inches in length.

Mr. T. K. CALLARD said that even if it were proved that the flints were the work of man, that would not be any proof of man's great antiquity. The resemblance between the flints broken by man and those which were fractured without man's interference, arose from the natural fracture of the flint which made it break in a particular way. As to the so-called palæolithic arrow and spear-heads, there was no evidence to show that they had ever been attached to shafts for offensive purposes, and without that evidence no tenable theory could be deduced from them. If he found a basket full of carpenters' tools in a cave, it would prove nothing as to the antiquity of man. With regard to the inscription "1688" in Kent's Cave,† very much depended on the position of that inscription ; it

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\* *Ancient Stone Implements*, p. 432.

† Dr. J. W. Dawson, F.R.S., in his *Story of the Earth and Man*, p. 304, says, in regard to Kent's cave :—"The somewhat extensive and ramifying cavern of Kent's Hole is an irregular excavation, evidently due partly to the fissures in limestone rock, and partly to the erosive action of water enlarging such fissures into chambers and galleries. At what time it was originally cut we do not know, but it must have existed as a cavern at the close of the Pliocene or beginning of the Post-pliocene period, since which time it has been receiving a series of deposits which have quite filled up some of its smaller branches.

"First and lowest, according to Mr. Pengelly, is a 'breccia,' or mass of broken and rounded stones, with hardened red clay filling the interstices. Most of the stones are of the rock which forms the roof and walls of the cave, but many, especially the rounded ones, are from more distant parts of the surrounding country. In this mass, the depth of which is unknown, are numerous bones, all of one kind of animal, the cave bear, a creature which seems to have lived in Western Europe from the close of the Pliocene down to the modern period. It must have been one of the earliest and most

should also be remembered that there was evidence to show that at one time there were large forests in that neighbourhood, and the decaying vegetation would supply a large amount of carbonic acid which would act as a solvent, and produce stalagmitic matter at a very rapid rate. But the same conditions did not exist now, and it was not to be argued, because it now took 200 years to form a deposit one-eighth of an inch thick, that the formation of every other eighth of an inch had also taken 200 years. As to the bone needle which had been referred to, that was found near the surface, among some coins, and nobody imagined the coins were thousands of years old. He was not sure whether even the evidence of extinct mammalia should

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permanent tenants of Kent's Hole at a time when its lower chambers were still filled with water. Next above the breccia is a floor of 'stalagmite,' or stony carbonate of lime, deposited from the drippings of the roof, and in some places three feet thick. This also contains bones of the cave-bear, deposited when there was less access of water to the cavern. Mr. Pengelly infers the existence of man at this time from a single flint flake and a single flint chip found in these beds; but mere flakes and chips of flint are too often natural to warrant such a conclusion.

"After the old stalagmite floor above mentioned was formed, the cave again received deposits of muddy water and stones; but now a change occurs in the remains embedded. This stony clay or 'cave-earth,' has yielded an immense quantity of teeth and bones, including those of the elephant, rhinoceros, horse, hyena, cave-bear, reindeer, and Irish elk. With these were found weapons of chip flint, and harpoons, needles, and bodkins of bone, precisely similar to those of the North American Indians and other rude races. The 'cave-earth' is four feet or more in thickness. It is not stratified, and contains many fallen fragments of rock, rounded stones, and broken pieces of stalagmite. It also has patches of the excrement of hyænas, which the explorers suppose to indicate the temporary residence of these animals; and in one spot, near the top, is a limited layer of burnt wood, with remains which indicate the cooking and eating of repasts of animal food by man. It is clear that when this bed was formed the cavern was liable to be inundated with muddy water, carrying stones and other heavy objects, and breaking up in places the old stalagmite floor. One of the most puzzling features, especially to those who take an exclusively uniformitarian view, is, that the entrance of water-borne mud and stones implies a level of the bottom of the water in the neighbouring valleys of about 100 feet above its present height. The cave-earth is covered by a second crust of stalagmite, less dense and thick than that below, and containing only a few bones, which are of the same general character with those below, but include a fragment of the human jaw with teeth. Evidently, when this stalagmite was formed, the influx of water-borne materials had ceased, or nearly so; but whether the animals previously occupying the country still continued in it, or only accidental bones, &c., were introduced into the cave or lifted from the bed below, does not appear.

"The next bed marks a new change. It is a layer of black mould from three to ten inches thick. Its microscopic structure does not seem to have been examined; but it is probably a forest soil, introduced by growth, by water, by wind, and by ingress of animals, at a time when the cave was nearly in its present state, and the surrounding country densely wooded. This bed contains bones of animals, all of them modern, and works of art ranging from

be accepted as proving a great antiquity, unless archæologists could say when those mammalia became extinct. The dodo was now extinct, but if he found one beside the skeleton of a man, it might only prove that the dodo was contemporaneous with modern times.

Professor TENNANT also bore testimony to the great rapidity with which stalagmitic matter was deposited under certain conditions. In the cave at Matlock birds' nests and chancellors' wigs were petrified by being put into the water, and ten wigs, which had belonged to Lord Eldon, were petrified in a couple of years. (Laughter.) In many districts in England, and especially in the north, spouts carrying water from mines were choked up in two or three years. In the British Museum there was a table, presented by the Duke of Rutland, made from the four sides of a spout. The aperture of the spout was originally one foot square, but it was reduced to four inches by five years' deposits.

Mr. TYLER thought the evidence shown by the existence of the sculptured tusks and bones of mammoths was very strongly in favour of the great antiquity of man, but, of course, its value must depend on the age in which

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the old British times before the Roman invasion up to the porter-bottles and dropped halfpence of modern visitors. Lastly, in and upon the black mould are many fallen blocks from the roof of the cave.

"There can be no doubt that this cave and the neighbouring one of Brixham have done very much to impress the minds of British geologists with ideas of the great antiquity of man, and they have, more than other post-glacial monuments, shown the persistence of some animals, now extinct, up to the human age. Of precise data for determining time, they have, however, given nothing. The only measures which seem to have been applied, namely, the rate of growth of stalagmite and the rate of erosion of the neighbouring valleys, are, from the very sequence of the deposits, obviously worthless; the only apparently available constant measure, namely, the fall of blocks from the roof, seems not yet to have been applied. We are therefore quite uncertain as to the number of centuries involved in the filling of this cave, and must remain so until a surer system of calculation is adopted. We may, however, attempt to sketch the series of events which it indicates.

"The animals found in Kent's Hole are all 'Post-glacial.' They therefore inhabited the country after it rose from the great Glacial submergence. Perhaps the first colonists of the coasts of Devonshire in this period were the cave bears, migrating on floating ice, and subsisting, like the Arctic bear, and the black bears of Anticosti, on fish, and on the garbage cast up by the sea. They found Kent's Hole a sea-side cavern, with perhaps some of its galleries still full of water, and filling with breccia, with which the bones of dead bears became mixed. As the land rose, these creatures for the most part betook themselves to lower levels, and in process of time the cavern stood upon a hill-side, perhaps several hundreds of feet above the sea; and the mountain torrents, their beds not yet emptied of glacial detritus, washed into it stones and mud and carcasses of animals of many species which had now swarmed across the planes elevated out of the sea, and multiplied in the land. This was the time of the cave-earth; and before its deposit was completed, though how long before, a confused and often-disturbed bed of this kind cannot tell, man himself seems to have been added to the inhabitants of the British land," &c.

the mammoth lived. In one case he understood the head of a mammoth had been discovered transfixed by a flint arrow-head.

Mr. DIBDIN asked the foundation for that statement.

Mr. WHITLEY remarked that the statement showed how necessary it was to be careful and accurate ; it was so far correct as that an arrow-head was declared to have been discovered embedded in the head of a reindeer, not the head of a mammoth.\*

The Meeting was then adjourned.

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\* See "Nilsson on the Stone Age," p. 171. It has been stated both by Mr. Drake and Professor Ansted, that a flint implement was found entangled in the horns of a stag (a reindeer) at Brixham ; but this has been disproved by Mr. Pengelly.—*The Geologist*, vol. iv. p. 288.—N. W.

## ORDINARY MEETING,\* MARCH 2ND, 1874.

THE REV. ROBINSON THORNTON, D.D., VICE-PRESIDENT,  
IN THE CHAIR.

The Minutes of the last Meeting were read and confirmed, and the following Elections were announced :—

MEMBER :—The Right Hon. Acton Smee Ayrton, 27, Hereford Square, South Kensington.

ASSOCIATES :—Lieut.-Col. Sir J. McN. Hogg, K.C.B., M.P., 26, Grosvenor Gardens ; the Rev. Canon Swainson, D.D., Norrisian Professor of Divinity, Cambridge ; the Rev. J. Challis, M.A., F.R.S., F.R.A.S., Plumian Professor of Astronomy, Cambridge ; Rev. N. Loraine, Vicarage, Grove Park West, Chiswick.

Also, the Presentation of the following Works to the Library :—

“Proceedings of the Royal U. S. Institution.” Part 75. *From the Institution.*

“Lectures to Volunteer Officers.” *Ditto.*

“Bampton Lectures for 1873.” By the Rev. Preb. I. G. Smith, M.A.  
*From the Author.*

“Faith and Philosophy.” By the same. *Ditto.*

“Discourses on the 1st Chapter of Genesis.” By the Rev. W. Robinson.  
*Ditto.*

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\* This meeting was very numerously attended. Letters of regret were received from the Rt. Hon. B. Disraeli, M.P., and The Rt. Hon. W. E. Gladstone, M.P. ; also the following from the Rt. Rev. the Bishop of Gloucester and Bristol :—

“Palace, Gloucester,  
“9th April, 1874.

“I am truly obliged by your note, and the enclosure. I read yesterday, very attentively, Mr. Forsyth’s paper, and cannot but feel that it is one of the clearest and best on the subject which I had ever the good fortune of reading.

“I am, with thanks,

“Very faithfully yours,

“Captain Petrie.”

“C. J., Gloucester and Bristol.”

The following Paper was then read by the Author :—

*THE RULES OF EVIDENCE AS APPLICABLE TO  
CREDIBILITY OF HISTORY.* By W. FORSYTH,  
Esq., Q.C., LL.D., M.P.

**T**O believe without any evidence at all is irrational; but to disbelieve against sufficient evidence is equally irrational.

By sufficient evidence I mean such an amount of proof as satisfies an unprejudiced mind beyond all reasonable doubt. Mathematical truth alone admits of *demonstration*. All other kinds of truth can only be proved by probabilities, which vary in an almost infinite degree, from the faintest kind of presumption to what is called moral certainty, which is accepted as practically equivalent to demonstration.

Upon evidence depends all our knowledge of past events; and it is astonishing how little is often sufficient to satisfy us. The mere fact of its being written in a book is enough to make no inconsiderable number of readers believe in the truth of a statement, without reflecting whether the author had or had not the means of ascertaining the truth; for if he had, we may be justified in putting faith in his honesty; but if he had not, his own assertion is worth nothing.

By proof I mean anything that serves, either mediately or immediately, to convince the mind of the truth or falsehood of a fact or proposition; and proofs differ according to the subject-matter of the thing to be proved.

One of the most common, and, at the same time, most satisfactory modes of proof as to things which do not fall within the experience of the senses is Induction, by which is meant the inference drawn from proved or admitted facts. It is for instance by induction that the general facts of Natural History are proved. When we say that all ruminant animals are cloven-footed, we cannot show any necessary connection between these physical phenomena, but having ascertained by a very large number of instances that they co-exist, and that in

no single case that has come under the observation of naturalists they fail, we are led irresistibly to the conclusion that the proposition is universally true, and we should predicate with confidence if a new race of animals were discovered in some hitherto unknown region, that if they are ruminants they are also cloven-footed. The underlying ground of belief in this case is our innate conviction of the prevalence of uniformity in Nature in things of the same kind. This uniformity we call a Law.

One test of the probability of a fact is its consistency with other facts previously known or admitted to be true—such as the constitution of human nature, the ordinary course of events, or some well-established truth. But it must be borne in mind, as Laplace has said, although perhaps in a different sense, that “Probability has reference partly to our ignorance, partly to our knowledge.” We must be tolerably sure we do know the other facts—and that they are not really inconsistent with the fact in dispute. Otherwise we shall be following the example of the King of Siam, who rejected as incredible the statement of the Dutch ambassador, that water could become a solid mass. This was simply because he had never seen or heard of it before; and it was contrary to his limited experience, or what he thought a law of nature. Hume felt the difficulty of this instance in the way of his argument against miracles, and attempts to get over it by saying that though the fact was not contrary to the king’s experience, it was not conformable to it. But this is not a fair way of putting it. Frost *was* contrary to the king’s experience as much as walking on the water without support is contrary to ours. And it cannot be denied that when by universal experience certain laws of nature are known to exist, it requires the strongest possible evidence to make us believe in any deviation from them. Hume’s famous argument against miracles is, that no testimony is sufficient to establish a miracle, unless the testimony be of such a kind that its falsehood would be more miraculous than the fact, and that no human testimony can have such force as to prove a miracle, because it is always more likely that the testimony should be false than that the miracle should be true.

The late John Stuart Mill has dealt with this argument in his *Logic*, and, I think, conclusively. He says that Hume’s celebrated doctrine, that nothing is credible which is contrary to experience, or at variance with the laws of nature, is merely the very plain and harmless proposition that whatever is contrary to a complete induction is incredible. And he goes on to show that any alleged fact is only contradictory to a law of causation when it is said to happen without an adequate coun-

teracting cause. "Now," says Mill, "in the case of an alleged miracle the assertion is the exact opposite of this . . . . A miracle is no contradiction to the law of cause and effect; it is a new effect supposed to be produced by the introduction of a new cause." He adds, truly enough, "That if we do not already believe in supernatural agencies no miracle can prove to us their existence." And we may freely admit with him, that "there is an antecedent improbability in every miracle, which in order to outweigh it, requires an extraordinary strength of *antecedent* probability derived from the special circumstances of the case." I shall have occasion to allude to the subject of miracles again hereafter.

History, from the Greek *ἱστορία*, properly signifies "investigation" or "research," and implies, therefore, etymologically, a narrative based upon inquiry about facts.

Few persons consider what the evidence is of the genuineness of books attributed to authors who lived before the invention of printing, most of which are derived from manuscripts which themselves were only copies, the originals having been utterly destroyed or lost. This includes all the histories of Greece and Rome written by classic authors. I have dealt with this subject in a lecture I delivered in 1872, in the Hall of the Inner Temple, which has since been published under the title of *History of Ancient Manuscripts*. I have not time to enter upon it here, but it is a very interesting subject of inquiry. I will only mention what Tischendorf, the great German Biblical scholar says, about the manuscripts of the New Testament: "Providence has ordained for the New Testament more sources of the greatest antiquity than are possessed by all the old Greek literature put together."

In one of his essays Lord Macaulay says of history:—"Perfectly and absolutely true it cannot be: for to be perfectly and absolutely true, it ought to record *all* the slightest particulars of the slightest transactions—all the things done, and all the words uttered during the time of which it treats. The omission of any circumstance, however insignificant, would be a defect. If history were written thus, the Bodleian library would not contain the occurrences of a week." And Lord Macaulay might have added that no one would care to have such a mass of useless verbiage in existence. He is surely wrong in saying that history is not absolutely true simply because it does not give us *all* the particulars of the slightest transactions. Even in a court of justice we do not think that a witness is not telling the absolute truth because he does not relate every particular, however insignificant, of the fact or conversation to which he

deposes. And this leads me to consider the difference between historical and judicial evidence. The late Sir George Cornewall Lewis says in that most valuable and learned work, *The Credibility of the Early Roman History* (Preface, p. 16), "Historical evidence, like judicial evidence, is founded on the testimony of credible witnesses. Unless those witnesses had personal and immediate perception of the facts which they report, unless they said and heard what they undertake to relate as having happened, their evidence is not entitled to credit. As all original witnesses must be contemporary with the events which they attest, it is a necessary condition for the credibility of a witness that he be a contemporary, though a contemporary is not necessarily a credible witness. Unless, therefore, a historical account can be traced by probable proof to the testimony of contemporaries, the first condition of credibility fails." If, however, it is meant to be asserted that the same degree of certainty ought to be required in historical that is required in judicial evidence, it would be exacting too much, and carrying scepticism too far. In the first place, the thing is an impossibility, and the consequence would be, that we should be logically compelled to withhold our belief from nine-tenths of so-called historical facts about which we have really no doubt at all. But, secondly, the circumstances are wholly different. Judicial inquiries relate to minute and special facts in dispute, where two parties are opposed to each other, and it is the duty and interest of both to adduce the best evidence of which the thing to be proved is susceptible. And in all civilized communities, their systems of jurisprudence lay down technical rules of evidence—in some countries much more strict than in others—which circumscribe the range of proofs. For instance, in France, hearsay evidence is always admitted; in England it is always excluded. In some parts of Germany a sort of arithmetical scale is applied to the testimony of witnesses. Different countries apply different rules of legal presumption, which are really not instruments of truth, but technical and positive modes of quieting controversy. But, to quote the words of an eminent writer on the law of evidence, "However widely different codes may vary from each other in matters of arbitrary positive institution, and of mere artificial creation, the general means of investigating the truth of contested facts must be common to all. Every rational system which provides the means of proof must be founded on experience and reason, on a well-grounded knowledge of human nature and conduct, on a consideration of the value of testimony, and on the weight due to coincident circumstances."—Starkie *On the Law of Evidence* (Preface).

But history deals with general rather than particular facts—with results rather than details—and from the nature and necessity of the case must be content with looser modes of proof than is necessary or expedient in judicial trials. All that we are entitled to ask from her is such an amount of evidence for the truth of the facts which she records as would satisfy the understanding of a reasonable man in the ordinary affairs of life. Every day we act upon evidence which, if offered in a court of justice, would be rejected. Too often we act upon very slight and insufficient evidence, especially in cases affecting the character of others; but in so far as we do this we act wrongly; and in the same manner we act wrongly when we accept as true the mere statement of a historian on any question where truth is of importance, when we have it in our power to examine his authorities and judge of their value for ourselves.

It is part of the constitution of human nature to confide in the veracity of others. If this were not so, a man's belief would be limited to matters within his own personal experience, and no progress could be made in knowledge, nor would improvement be possible. There is a tacit assumption, when we yield to the force of oral evidence, of what I may call the major premiss of our syllogism, viz., that men will generally speak the truth. Experience teaches us, if indeed it is not an intuitive impulse, to put faith in human testimony.

How beautiful is the trusting simplicity of childhood, and the absolute reliance which a child places in the word of its parents. But as we grow older this confidence is shaken, and experience compels us to acquiesce in the truth of the melancholy maxim of Lord Chatham, that "confidence is a plant of slow growth in an aged bosom." That stern monitor experience tells us that it by no means follows that because we have contemporary testimony to a fact the fact is true. Witnesses are often mistaken, and their evidence is not unfrequently false. We must, therefore, so far as is possible, apply certain rules by which to test the probability of its truth. I have already alluded to one test of probability, and that is the agreement of the fact with other facts known or admitted to be true. Another test is the concurrence of the testimony of independent witnesses, always supposing that each of them has had the means of knowing the fact or facts to be ascertained. Of course I exclude all copying from the same original, and this, perhaps, is implied in the word independent. As Archbishop Whately has observed, "For though in such a case each of the witnesses should be considered as unworthy of credit, and even much more likely to speak falsehood than

truth, still the chances might be infinite against their all agreeing in the same falsehood" (*Rhetoric*, pt. i. ch. ii. sec. 4). And in his *Philosophy of Rhetoric*, Dr. Campbell says: "It deserves likewise to be attended to on this subject, that in a number of concurrent testimonies (in cases wherein there could have been no previous concert) there is a probability distinct from that which may be termed the sum of the probabilities resulting from the testimonies of the witnesses, a probability which would remain even though the witnesses were of such a character as to merit no faith at all. This probability arises purely from the concurrence itself. That such a concurrence should spring from chance is as one to infinite; that is, in other words, morally impossible." Lord Mansfield once said, with reference to the credit to be given to certain reporters, "It is objected that these are books of no authority, but if both the reporters were the worst that ever reported, if substantially they report a case in the same way, it is demonstration of the truth of what they report or they could not agree" (*R. v. George*, 1 Cowp. 16).

Generally speaking, the silence of contemporary writers as to a fact throws strong suspicion on its genuineness. But this test is not conclusive, for we may have overpowering evidence *aliunde* of its truth. Lord Macaulay says: "We have read books called histories of England under the reign of George II. in which the rise of Methodism is not even mentioned." And Varnhagen von Ense mentions in his Diary that Humboldt had adduced "three important and perfectly undeniable matters of fact as to which no evidence is to be found where it would be most anticipated. In the archives of Barcelona no trace of the triumphal entry of Columbus into that city; in Marco Polo no allusion to the Chinese Wall; in the archives of Portugal nothing about the voyages of Amerigo Vespucci in the service of that crown." But notwithstanding this, the silence of contemporary authority is one of the notes of falsehood with respect to an alleged historical fact. How do we know that the story of William Tell and his shooting an arrow at an apple on his son's head is untrue? Because we do not find it in contemporary history; and the first mention of it as a Swiss legend occurs in the chronicle of Melchior Russ, registrar at Lucerne, some two hundred years later. But, in addition, we find that the same story is told in Saxo Grammaticus, who wrote in the twelfth century, of a Danish hero; a similar tale was current in Ireland; and in the *Bilkinsaga* it is told of the mythical Egil, the brother of Wieland, the smith. It also occurs in the legendary fables of Holstein, Norway, and other countries; and although it is impossible to trace the origin of the story, it is certain that no

such occurrence happened in Switzerland. It is one of the *enfants trouvés* of historical literature, which can lay no claim to legitimate paternity.

Why do we reject the story of the blind Belisarius begging his bread in the streets of Constantinople? Because Procopius, who was a contemporary historian, and accompanied Belisarius in his Eastern wars, in Africa, and in Italy, says nothing in his account of the life and misfortunes of Justinian's famous general, of his blindness or beggary; because no other contemporary writer mentions them, and because the first hint of them occurs in some Greek verses written by John Tzetzes, a grammarian, about 600 years after the death of Belisarius. Why do we not believe the fable of Pope Joan, whose accouchement is said to have taken place in the midst of a procession at Rome? Because no contemporary author makes mention of such an astounding occurrence, and we find the first allusion to it in the *Chronicon* of Marianus Scotus, who lived two hundred years afterwards. Even that passage is supposed to be an interpolation, and the first author who really tells the story is Stephen de Bourbon in the thirteenth century. A not improbable explanation of it is that one of the Popes, who led an immoral life, had a mistress named Joan, who had such influence over him that she was called *Papesse*, and from this the story had its origin.

Why do intelligent and well-educated men accept as true the miracles of the New Testament, and reject as untrue the legends of the Saints? This is not the place, nor would it be possible within the limits to which I must confine myself, to go into the proofs of the miracles related in the Gospels and the Acts. But briefly and summarily it may be said that we believe them,—1. Because they are recorded by eye-witnesses, who must either have been the dupes of an imposture or the fabricators of a falsehood. 2. They were done openly in the face of enemies who, so far as we know, never denied them. 3. They were done with an adequate motive and cause. 4. They serve to explain the origin of a religion which has lasted for eighteen centuries and won its way in spite of the fiercest opposition. Now, applying these tests to the legends of the Saints, we find that they fail in almost every particular! Hardly any of them rest on the testimony of eye-witnesses. They are almost always isolated acts done in a corner, and not *coram populo*. And the most famous of them, which is an exception to the rule, I mean the cutting out of the roots of the tongues of a number of Christians at Tipasa, who afterwards spoke articulately and distinctly, has been shown by Mr. Twistleton in his able work, *The Tongue not Essential to Speech*, to be no miracle

at all, but perfectly explainable by natural causes. Moreover, the mediæval miracles are for the most part silly, unmeaning, and childish, and they are often recorded by writers who lived long after they are said to have occurred, who breathed an atmosphere of credulity and were utterly destitute of the critical faculty. Such considerations are quite sufficient to justify our unbelief. If it is objected that intelligent Roman Catholics believe them, we answer that they are the disciples of a system which forbids the right of private judgment on questions determined by the authority of the Church; and we may well think it easy for men who believe in the doctrines of the Immaculate Conception and the Infallibility of the Pope, to believe also in the winking of an image of the Virgin, the liquefaction of the blood of St. Januarius, and the transportation through the air of a house of the Virgin from Palestine to Loretto. Thus we find a man of the intelligence of Dr. Newman saying: "Crucifixes have bowed the head to the suppliant, and Madonnas have bent their eyes on assembled crowds. St. Januarius's blood liquefies periodically at Naples, and St. Winifred's well is the source of wonders even in an unbelieving country. . . . St. Francis Xavier turned salt water into fresh for five hundred travellers; St. Raymond was transported over the sea on his cloak; St. Andrew shone brightly in the dark . . . . I need not continue the catalogue. It is agreed on both sides; the two parties join issue over a fact—that fact is the claim of miracles on the part of the Catholic Church. It is the Protestant's charge, and it is our glory."

I may here in passing allude to the monstrous theory of Strauss that the simple narratives in the four Gospels are mere myths, which grew out of a body of belief which, somehow or other, had taken possession of men's minds in the second century of our era, and are no more real than the legends of Theseus and Hercules. Our common sense revolts against such an absurdity, and if Strauss himself really believed it, it only shows that no credulity can be greater or more childish than the credulity of an infidel.

Why do we believe Thucydides and disbelieve Livy? I shall speak of both of these writers more fully hereafter, but here I may say that we believe Thucydides because he was a contemporary of the events which he relates; he was himself an actor in some of them: he had access to authentic information, both oral and monumental, and we have no reason to distrust his veracity. Of course I do not include the long speeches he puts into the mouths of the characters he introduces, for they are obviously manufactured, or, at all events, dressed up for the occasion, according to a practice very common in

antiquity. We disbelieve a great part of the narrative of Livy for the following reasons. We know that he could have had no trustworthy authority for many of his statements respecting the early history of Rome: some of those statements are intrinsically improbable, if not incredible: he lived centuries later than many of the events which he records, and he had not the critical faculty which enables an historian of the past, by a kind of instinct, to separate the true from the false. To this I must add the essentially Roman prejudice in favour of everything that would tell in favour of the greatness and glory of Rome. Hence his unfair account of the early wars of the Republic, and the injustice with which he has treated Hannibal.

We believe the story of the Anabasis and Retreat of the Ten Thousand, because the historian was the general who commanded the Greeks in that famous expedition; but we reject his fables about dreams, omens, and prophecies, because we know that he was credulous about such things, and they were not matters which came within the scope of his own personal observation.

Our own early historians were as careless as their readers were credulous. King Lear, the son of Bladud, was accepted as an historical personage; and even Milton, in his History of England, admits the fable "of Brutus and his line with the whole progeny of kings to Julius Cæsar," although it is impossible not to see that he has little faith in it. But he says, "certain or uncertain, be that upon the credit of those whom I must follow; so far as keeps aloof from impossible and absurd, attested by ancient writers from books more ancient, I refuse not as the due and proper subject of story." Now, why do we refuse to believe the narrative? Simply because, although it may contain nothing "impossible or absurd," which is Milton's sole rule of exception, we know that the authors could not possibly have had any authentic information about the facts which they record. A child is as competent to write history as a grown-up man, if the statements of preceding authors are merely servilely copied, and no critical examination is made of the sources of their authority and the means they had of ascertaining the truth.

Dates are often of the utmost importance in verifying historical facts, but the dates themselves are sometimes uncertain. In Grecian history the general custom was to reckon by the year of the Olympiad, and therefore it is essential to know the date of the first year of the first Olympiad. Now, how do we ascertain this? If you will look into Clinton's *Fasti Hellenici*, p. 150, you will see that it is taken to correspond with 776 B.C., and this is proved by a curious *consensus* of authorities. The

games were celebrated at intervals of four years, and if we know independently the exact date of an event, and find it placed in the particular year of a particular Olympiad, we can, by reckoning backwards, ascertain accurately the date of the first. For instance, we know, from contemporary or other evidence, that the consulships of C. Pompeius Gallus and Q. Verannius, at Rome, coincided with the first year of the 207th Olympiad, and we know the year of the Christian era of those consulships: this was the year A.D. 49. Now, 206 Olympiads or 824 years had elapsed since the beginning of the first, and this gives the year B.C. 776 as its date.

It is no doubt difficult to invent wholly so-called historical facts, which, if closely compared with known contemporaneous occurrences and ascertained dates, may not be shown to be false. But it is often still more difficult to find the material for such criticism. Oblivion may have swallowed up the records of the past, and then the only tests we can apply are the inherent probability or improbability of the alleged facts, their consistency or inconsistency with themselves, and our knowledge of the means which the writer possessed of being acquainted with their truth. I have already pointed out the untrustworthiness of historical statements first made by authors who lived long after the events which they record. And I have also shown that it is by no means altogether safe to gauge the credibility of a fact by its agreement or disagreement with probability; but as regards the test supplied by the means of comparing historical allegations with other historical facts which have been sufficiently proved, some of the most brilliant triumphs of criticism have been won by applying it. My time is too limited to allow me to adduce more than one or two specimens of this, and I think I cannot do better than cite that splendid example of scholarship and criticism, Bentley's *Dissertation on the Genuineness of the Epistles of Phalaris*. The history of its authorship is this. About the year 1690, Sir William Temple published an essay upon Ancient and Modern Learning, in which he maintained the superiority of the ancients. And in support of his position, "that the oldest books we have are still in their kind the best," he adduced the "Fables of Æsop" and the "Epistles of Phalaris." This attracted attention to the epistles, and a new edition of them was given to the world by the Hon. Charles Boyle; and then Bentley published his *Dissertation on the Epistles of Phalaris*, the object being to prove that they were spurious. I may mention, in passing, that an amusing parody of the original controversy between the respective champions of ancient and modern learning was written by Swift, called "The Battle of the Books." It may be interesting to point out some of the proofs by which Bentley

for ever destroyed the credit which had been given to these epistles:—

- (1.) He shows that in them Phalaris speaks of borrowing money from the inhabitants of a town in Sicily nearly three centuries before that town was built.
- (2.) Phalaris is represented as giving to the physician a present of cups, called by the name of a Corinthian potter who lived more than a hundred years after Phalaris' death.
- (3.) Phalaris speaks of Zancle and Messene as distinct towns, whereas, in truth, Zancle was merely the ancient name of Messene.
- (4.) In one of his letters, Phalaris addresses Pythagoras as a philosopher, and speaks of his system of philosophy, whereas we know that Pythagoras first called himself a philo-sophos, or lover of wisdom, when Leon of Sicyon asked him what he was. And it is impossible to believe that the term was in vogue, or even known to Phalaris, who, when he wrote the letter, had never seen Pythagoras.
- (5.) Phalaris is very angry with Aristolochus for writing tragedies against him at a time when the word tragedy was utterly unknown.
- (6.) Phalaris writes in Attic Greek, whereas, as a Sicilian, his dialect would have been Doric.

Let me illustrate this kind of criticism by a different example. On the Monte Cavallo—the old Quirinal Hill, at Rome—stand two colossal statues of horses, called “Colossi di Monte Cavallo.” Under one pedestal are, or were, inscribed the words *Opus Phidiæ*, under the other *Opus Praxitelis*. But formerly there were two more elaborate inscriptions, one to the effect that Phidias had here sculptured Bucephalus, the horse of Alexander the Great; and the other that Praxiteles, in competition with Phidias, had sculptured another figure of the same horse, Bucephalus. Now Phidias died somewhere about 432 B.C. Praxiteles flourished in 364 B.C., nearly a century later, and Alexander the Great was not born until 356 B.C. This was too much for even the credulity of a bygone generation, and Pope Urban VIII. effaced the inscriptions, and substituted for them the simple words *Opus Phidiæ* and *Opus Praxitelis*, which had at all events the merit of not being guilty of a palpable anachronism, although each is most probably absolutely untrue. But such an anachronism is not quite so bad as that of the writer in a *feuilleton* of the *Constitutionnel* (supposed to have been Lamartine), who says, “The tombs of great poets inspire great passions. It was at Tasso's tomb that Petrarch nourished his respectful remembrance of *Laura!*”

Now, Petrarch died in 1374, and Tasso published his *Gerusalemme Liberata* in 1581!

This is very different from any argument against the genuineness of a fact founded merely on discrepancies of statement. A curious instance of this occurs in the accounts given of the execution of the Earl of Argyle in 1661. Clarendon says that he was condemned to be hanged, and executed. Burnet and Echard say that he was beheaded. This has been made use of by Paley, in his *Evidences of the Christian Religion*, with reference to the variance in the statements of the Evangelists as to the circumstances of the Crucifixion. No one doubts that Argyle was executed, which is the important fact; and there would be still less reason to doubt the fact of the Crucifixion, however the Evangelists may differ in minute details. It is, of course, a difficulty in the way of those who assert the literal and verbal inspiration of the Scriptures, but that is a subject foreign to my purpose, and too large to be dealt with by a passing notice in such an address as this.

It is a strange paradox that the belief of some writers and many readers seems to increase in the inverse ratio of the probabilities of the case. How else can we account for the fact that the more history recedes into the darkness of the past, bold statements are received with unquestioning credulity. Thus Dr. Hales in his work on chronology assures us that the thirty reigns of the Athenian kings and archons from Cecrops to Creon, form "one of the most authentic and correct documents to be found in the whole range of profane chronology,"—the truth being that the reigns of the kings are little better than fabulous; and Bunsen, in his *Egypt's Place in Universal History*, undertakes to reconstruct the authentic chronology of Egypt for a period of nearly 4,000 years before Christ, and "to restore to the ancient history of the world the vital energy of which it has been so long deprived," although his chief authorities, independently of some monumental inscriptions, are Eratosthenes and Manetho, writers who lived more than 3,000 years after the period which they are supposed to authenticate. Now Manetho composed his history from two sources, temple registers and popular legends. I need say nothing about the latter, but what possible ground have we for believing that their priest-kept registers contained true accounts of events that happened thirty or forty centuries before the historian inspected them? Eratosthenes, at the request of Ptolemy, drew up a list of thirty-eight Theban kings, occupying a period of more than a thousand years: and it is sufficient to say with Mr. Grote that he "delivered positive opinions upon a point on which no sufficient data was accessible, and therefore

was not a guide to be followed. History thus written is nothing but clever guess-work, and amounts to no more than plausible conjecture, in which the chances are almost infinite that the narrative is, if not wholly, at least materially wrong. As the speculation of an ingenious mind it may be interesting, but as a record of facts it is worthless."

In his essay on the uncertainty of the history of the first four centuries of Rome, in the *Memoirs of the Academy of Inscriptions*, tome vi. p. 71, M. de Pouilly says:—"History is the narrative of a fact which we derive from those whom we know to have been witnesses of it. It results from this definition that for a history to be authentic its author, or at all events the person on whose narrative it is based, must have lived at the time when the events happened." And the same writer adds, "Tradition is a popular rumour of which the source is not known. It is a chain of which we hold one end, but the other is lost in the abysmal depths of the past."

To show the danger of trusting to tradition, I may take as an illustration the amusing game called "Russian Scandal," where a party being seated together in a row, a person at one end whispers some story into the ear of his neighbour, who repeats it in the same manner to the one next to him, and so on until it comes to the last, who tells aloud what he has heard. It will be generally found that the story thus transmitted varies essentially from the story as originally told, and the experience of every one as to the gossip of society teaches the same lesson. Laplace, in his *Essai Philosophique sur les Probabilités*, has made this the subject of a mathematical calculation. He says, "Suppose a fact to be transmitted through twenty persons; the first communicating it to the second, the second to the third, &c., and let the probability of each testimony be expressed by nine-tenths (that is, suppose that of ten reports made by each witness nine only are true), then at every time the story passes from one witness to another the evidence is reduced to nine-tenths of what it was before. Thus, after it has passed through the whole twenty, the evidence will be found to be less than one-eighth."

But belief by no means depends upon actual testimony. We believe in the results of mathematical inquiry by reasoning. We believe in the existence of a Creator by arguments drawn from design and other considerations. We may or may not believe that the planets are inhabited from arguments drawn from analogy. We believe many other facts from their inherent probability, and so on. But in many such cases it would be more proper to speak of our persuasion than our belief, by

which I mean, that our minds stop short of full conviction ; but on weighing the evidence or arguments on both sides in opposite scales, we see that the balance inclines one way more than the other, and therefore we are disposed to think that such and such a proposition is true. This applies to many of the disputed facts of history. In his *Grammar of Assent*, in order to show that certitude is the result of arguments which, taken in the letter, and not in their full implicit sense, are but probabilities, Newman takes the case of the following propositions :—

- (1.) That we are absolutely certain that Great Britain is an island. But how do we know this? Those who have actually circumnavigated the country have a right to be certain ; but which of us has done this, and which of us has even met with any one who tells us that he has done it? Newman shows by the common arguments that there would be a manifest *reductio ad absurdum* attached to the notion that we can be deceived on such a point as this, but at the same time that we are satisfied with proof which is not of the highest kind possible.
- (2.) He takes the question of the authorship of the *Æneid*, the plays attributed to Terence, and the so-called histories of Livy and of Tacitus, which the Abbé Hardouin maintained were the forgeries of the monks of the thirteenth century. We must not forget that our knowledge of the ancient classics comes entirely from mediæval copies of them made by monks from manuscripts which now no longer exist. How do we know that some of these so-called copies were not actual forgeries? \* The strongest argument against such a supposition is our disbelief in the ability of mediæval monks to produce such works ; and Newman says, justly enough, that an instinctive sense of this and a faith in testimony are the sufficient but undeveloped argument on which to ground our certitude. To faith in testimony we must add the absence of dissentient claims, and this will be found to be one of the most cogent reasons for our belief.
- (3.) Newman asks, What are my grounds for thinking that I, in my particular case, shall die? What is the distinct evidence on which I allow myself to be certain? Death to me is a future event. How do I know that, because all past generations have died, the same

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\* "To forge and counterfeit books and father them upon great names has been a practice almost as old as letters."—Bentley's *Dissertation on Phalaris*.

law must hold with regard to myself or others? He says, that the strongest proof I have for my inevitable mortality is the *reductio ad absurdum*; but I think that here he is mistaken that there is *reductio ad absurdum*, in the proper sense of the term, in the belief that I shall never die, although we may admit, with Newman, that there is a surplusage of belief over proof when I determine that I individually must die.

In that very clever and amusing *jeu d'esprit* by Archbishop Whately, *Historic Doubts relative to Napoleon Buona-parte*, he has shown that logically we are not justified in believing that such a person as the first Emperor of the French ever existed. To state such a proposition seems to carry with it its own refutation, but the mock-serious argument of the Archbishop is sustained with wonderful skill and ability. His object, of course, was to show that the kind of reasoning by which infidels attempt to shake our faith in the narrative of Scripture *ought* equally to shake our belief in the existence of the first Napoleon.

I will now say a few words about the father of history, Herodotus, and briefly compare him with Thucydides.

In his *Literature of Greece*, Colonel Mure calls Herodotus "an essentially honest and veracious historian," and says that, "rigid, in fact, as has been the scrutiny to which his text has been subjected, no distinct case of wilful misstatement or perversion of fact has been substantiated against him." Now what were the materials which Herodotus had for composing his history? They were (1.) previous histories; (2.) monumental records preserved in national repositories and religious sanctuaries or places of public resort. He himself quotes only one older historian, Hecataeus of Miletus, but several others had written before him, such as Œgeon of Samos, Bion, and Deïochus of Proconnesus, Endemus of Paros, Charon of Lampsacus and Pherecydes of Leros. We do not, however, know that Herodotus really had access to copies of their manuscripts, which would have been written on *papyri*, and must have been few and costly. He was a great traveller and a diligent inquirer, and obtained a considerable part of his information from what he saw with his own eyes, and heard from persons acquainted with the facts. He tells us that he sifted and compared conflicting statements, and he often rejected stories which he did not think he had warrant for believing. But it is curious that in some cases his scepticism is now known to have been wrong. Thus he disbelieves the story of the circumnavigation of Africa by the Phœnicians in the seventh century

before our era, on account of the marvel related by the voyagers, that as they sailed "they had the sun on their right," which is the strongest possible confirmation of the truth of the account. He cautiously doubts the existence of an amber-yielding district on the Northern Sea, and of any islands called Cassiterides, from which tin was said to be brought. But we know that amber is found on the shores of the Baltic, and that the Cassiterides were our own Scilly Islands. Some of his statements, which were formerly regarded as impossible or incredible marvels, have, by the progress of later discovery, been proved to be true. Such are his accounts of a race of men dwelling upon scaffoldings in Lake Prasias and living upon fish (v. 16), in fact, Lacustrians; of a breed of sheep in Arabia with such long tails that they were supported on trucks to preserve them from injury (iii. 13), as is the case in North Africa, and, I believe, in some parts of Spain at the present day. And to show that he is by no means the *gobemouche* that he is sometimes represented, I may instance what he says of the Arimaspians, a one-eyed race, who stole gold from the griffins, whom Milton thus mentions:—

"As when a gryphon in the wilderness,  
With winged course o'er hill or moory dale,  
Pursues the Arimaspians, who by stealth,  
And from his wakeful custody purloined  
The guarded gold."

Herodotus says that he cannot persuade himself to believe the story, giving the sensible reason that there cannot be a race of men with one eye, who in all things else resemble the rest of mankind.

The value of Thucydides as a historian depends first on our faith in his honesty, and secondly on the fact that he had access to contemporary testimony both oral and monumental. He was born about twenty-five years before the outbreak of the Peloponnesian war, and he took part in some of its events; but he most chiefly relied for information on the statements of others who had themselves been actors in the scenes that they described. He sometimes quotes inscriptions on monuments (i. 132-134), and letters, and despatches (iv. 50; vii. 8; viii. 50), of which he had no doubt seen the originals or copies. He clearly was a man of sound judgment and great intelligence. Upon the whole we have as good reason for believing the history of Thucydides as we have for believing any other profane author; but, as I have before observed, we are not to suppose that the long speeches which he puts into the mouths of Pericles and others were spoken as he reports them. They are rather forms of stating the arguments on both sides, such as Thucydides understood them.

Until a comparatively recent period the history of Rome, as told by Livy, was implicitly believed; and as much credit was given to his account of the regal government of Rome as to the annals of the empire by Tacitus, a contemporary writer. Machiavel, in his *Discourses on the First Decade of Livy*, accepts the story of the twelve kings as not less real than the story of the lives of the twelve Cæsars.

The first scholar who seems to have questioned the truth of the old narrative about Rome was Cluverius (a Latinized name for Philip Cluver, who was born in Dantzic in 1580). He published, in 1624, a book called *Italia Antiqua*, in which he expressed his opinion that Roman history before the capture of the city by the Gauls was all uncertain; and he rejected the account of Trojan settlement, in Latium, the Alban dynasty, and the story of the foundation of Rome by Romulus. Others followed in the same track; I may mention Bochart, and Perizonius, and Pouilly, until at last the subject received an exhaustive examination in the remarkable work of Beaufort, a French Protestant refugee, who published at Utrecht, in 1738, his *Dissertation sur l'Incertitude des Cinq Premiers Siècles de l'Histoire Romaine*.

Beaufort is entitled to the honour of ranking as the pioneer of a new school of criticism; but it was not until the publication of Niebuhr's *History of Rome*, in 1811-12, that the subject attracted the attention it deserved. This work may be said to have revolutionized the world of thought in relation to Roman history. Its destructive power is irresistible, but its constructive power is very different. I will not say that Niebuhr endeavoured to evolve a history of Rome out of his own consciousness—like the famous story of the camel evolved by one of his countrymen—but he certainly trusted a great deal too much to sagacity of conjecture, which he dignified by the title of "discovery." He even goes so far as to liken his faculty in that respect to the power of divination—the *μαντεία* of the Greeks (vol. iii. p. 318). But it is one thing for a Cuvier or an Owen to build up the form of an animal from a single bone, and another for a historian to presume to construct a narrative of the distant past from a few isolated hints, or even isolated facts. In the animal form there is a correlation of parts, and a law of typical conformity, which enables the anatomist to ascend with almost unerring certainty from bone to limb, and from limb to body, and to clothe the body with its proper integuments, until we can see by the eye of imagination the very form that has ceased to exist upon the earth for perhaps millions of years. But such an induction is not possible in the case of human affairs and human actions; *varium et mutabile semper*

would be their appropriate motto, and the events that actually happen often verify the saying that truth is stranger than fiction.

There is an old Scotch proverb, "Give a romancer a hair and he will make a tether of it," and this applies to a certain school of writers of history. Out of a scrap of prose or a line of verse, or a broken fragment of an inscription, they will, by the aid of an active imagination, construct whole pages of narrative. The character of a people and the state of its society will be inferred from a few lines which may, when they were written, have been quite untrue, or mere satire, or a gross exaggeration. The historian in modern times who has been most conspicuous for the use of such materials is Lord Macaulay. The result is, that not consciously but inevitably truth is sacrificed to effect. I will mention two instances of this—his account of the Highlands, and his account of the state of the English clergy in the seventeenth century.

It is not pleasant to detract from the merit of a work of such brilliancy as Lord Macaulay's History, but it is impossible not to see that he has been misled into many great mistakes. I speak not now of his almost bitter hatred of the Duke of Marlborough, which induces him to paint his character in the blackest colours, and his almost idolatrous admiration of William III., which induces him to palliate all his faults, even that of faithlessness to his wife; but I allude to specific facts, in which the historian has been shown to be utterly wrong, and I would recommend those who doubt it to read the *New Examen*, by Mr. Paget (London, 1861), in which the author has, with admirable acumen, instituted "an inquiry into the evidence relating to certain passages in Lord Macaulay's History." He has shown, I think satisfactorily, that Lord Macaulay has been inaccurate and unjust in his account of the execution by Claverhouse, of Brown, the so-called Christian carrier; that he has confounded William Penn, the founder of Pennsylvania, with a George Penn, in describing a disreputable transaction relative to the maids of Taunton; and that he is mistaken in several other matters of fact.

I have often thought how strangely history would have to be rewritten, if we could summon from the world of spirits those who were the chief actors in many of the events which it records, and obtain from them a true version of such events. How many motives would then be disclosed of which we now know nothing! How many inferences would be shown to be erroneous! How many facts would be altered in their complexion! And yet, in fairness, I ought to mention, how seldom it has happened that popular verdicts, with respect to the

characters and events of history, have been proved to be wrong by subsequent researches. I may instance the attempts that have been made of late years to whitewash the characters of Tiberius, Henry VIII., and Robespierre, all of which seem to have signally failed.

Amongst other questions we should like to be able to put to satisfy our curiosity, I may select almost at random the following.

Who were the Pelasgians and whence came the Etrurians?

Was there a real war of Troy, and what were the facts?

Did Demosthenes receive any part of the money given up by Harpalus when he was arrested at Athens?

Who was the real founder of Rome?

What was the origin of the story that the Laws of the Twelve Tables were the result of a mission sent from Rome into Greece in the fifth century before Christ?

What authority had Suetonius for nine-tenths of the gossiping anecdotes contained in his *Lives of the Twelve Cæsars*?

Was St. Peter ever Bishop of Rome? Beyond mere tradition there is no evidence that the Apostle ever even visited that city, much less that he was Bishop of it. Let those who assert the contrary refute, if they can, the facts and arguments of Barrow, in his "*Treatise on the Pope's Supremacy.*" And yet, how much of the teaching of the Roman Catholic Church depends upon the assumption that St. Peter was the first bishop of Rome, and that the Popes are his legitimate successors!

Was Petrarch's Laura a living creature of flesh and blood or a mere poetical myth?

What was the real character of Richard III., and is it true that he was accessory to the murder of the Princes in the Tower, if murdered they were?

Horace Walpole concludes his ingenious essay called "*Historic Doubts in the Life and Reign of King Richard III.*" in the following words:—"We must leave this whole story dark, though not near so dark as we found it; and it is, perhaps, as wise to be uncertain in one portion of our history as to believe so much as is believed in all histories, though very probably as falsely delivered to us, as the period which we have here been examining."

What were the real facts of the Gowrie conspiracy in Scotland?

Did Mary Queen of Scots really write the letters to Bothwell which were produced from a silver casket before the Commissioners at Westminster, and which, if genuine, establish the fact of her being accessory to the murder of Darnley?

Was Anne Boleyn guilty of the charges brought against her by Henry VIII.? Mr. Froude has laboured to prove that she was, but his arguments are very far from convincing.

What was the real cause why James I. spared the life of the Earl of Southampton, after his conviction of the murder of Sir Thomas Overbury?

Who was the man in the Iron Mask? Who wrote the letters of Junius?

It is extraordinary how few of the anecdotes which pass current in literature will bear the test of critical inquiry, and the result of a careful investigation of the evidence is apt to dispose the mind to general scepticism on such subjects. Let me mention a few instances which will serve to enliven what otherwise, I fear, has been rather a dull discourse.

The first I shall mention is not an anecdote, but a so-called historical fact.

We find it stated in Lempriere's Classical Dictionary that the army which Xerxes led into Greece consisted of upwards of five million souls, and he says that "the multitude which the fidelity of historians has not exaggerated was stopped at Thermopylæ by 300 Spartans under King Leonidas." The thing is simply impossible, and therefore incredible, unless we adopt the maxim of Tertullian, and say, *Credo quia impossibile est*.

The story of Canute commanding the waves to advance no farther first appears in Henry of Huntingdon, who wrote a century after the Danish king. The legend of Fair Rosamond is treated by Hume as fabulous; and the greatest suspicion rests on the account of St. Pierre and his companions delivering up the keys of Calais to Edward III., with halters round their necks, and having their lives spared at the intercession of the Queen. The popular story of the origin of the Order of the Garter, as owing to the accident that happened to the Countess of Salisbury when dancing at the court of Edward III., is first mentioned by Polydore Virgil, who wrote 200 years later. In his Lives of the Judges, Mr. Foss has shown that the story of the re-appointment of Sir William Gascoigne as Chief Justice, by Henry V., who, when Prince of Wales, had been committed by him to prison for an assault, is the reverse of true, for it seems that Henry V. actually deprived him of the office of Chief Justice a few days after his accession to the throne. The interesting story that Cromwell, Hampden, and Hazelrig had actually embarked for New England in 1638, prepared to abandon the country for ever, when they were stopped by an Order in Council, has been proved to have no foundation in fact.

The celebrated phrase attributed to Francis I. after the

battle of Pavia, *Tout est perdu fors l'honneur*, turns out to have been *l'honneur et la vie qui est sauvé*, which deprives it of all its point. As to the story of the chivalrous interchange of courtesies between the English and French guards at the battle of Fontenoy, "Monsieur, bid your men fire." "No, sir, we never fire first,"—Carlyle says, in his *Life of Frederick the Great* (vol. iv. p. 119), "It is almost a pity to disturb an elegant historical passage of this kind circulating round the world in some glory for a century past; but there has a small irrefragable document come to me which modifies it a good deal, and reduces matters to the business form." This document is a letter from Lord Charles Hay, lieutenant-colonel of the Guards, written or dictated about three weeks after the battle, and giving an account of what happened. In this no mention is made of the occurrence, and we may confidently believe with Carlyle, that "the French mess-rooms (with their eloquent talent that way) had rounded off the thing into the current epigrammatic redaction."

We all know how French historians, including M. Thiers, repeat the story of *Le Vengeur* refusing to strike her flag in the action of the 1st of June, 1794, and going down into the depths of the ocean while her crew shouted *Vive la République!* This has been shown by Admiral Griffiths, who was living in 1838, one of the few survivors of the engagement, and who wrote a letter on the subject, to be as he calls it "a ridiculous piece of nonsense." When the *Vengeur* sank, the action had ceased for some time. She had been taken possession of by the boats of the *Culloden*; and as to the crew, Admiral Griffiths says, "never were men in distress more ready to save themselves." There was "not one shout beyond that of horror and despair." And yet the lie will live in the annals of French heroism, and will perhaps be believed to the end of time.—See *Carlyle's Essays*, vol. v. pp. 356–359.

Before I conclude I will, with reference to the special objects of this Institute, state in as terse a form as possible the reasons why we are justified in believing on historical grounds the truth of the narratives in the New Testament, excluding all consideration of its doctrines:—

- (1.) The contemporary nature of the testimony.
- (2.) The artlessness and *apparent* truthfulness of the writers.
- (3.) The substantial agreement, together with the circumstantial variety of the statements, of four different contemporary eye-witnesses.
- (4.) The undesigned coincidences which exist between the Gospels and Acts on the one hand and the Epistles on the other.

- (5.) The absence of any conceivable motive for fraud or falsehood.
- (6.) The difficulty, if not the absurdity, of supposing that the teachers of the purest morality should be engaged in the immoral work of propagating an imposture and forging documents.
- (7.) The utter absence of any contradiction to their statements during the first four centuries.
- (8.) The frequent reference to the words of the four Evangelists by writers who lived in the first two centuries, showing that their narratives were then current and well known.
- (9.) The adequacy of the cause for miraculous interposition, if we believe in a benevolent Creator and in the immortality of the soul.
- (10.) The sufficiency of the accounts to explain the phenomenon of Christianity as a religion which now exists in the world, whereas no other theory has or can explain it.

If these be not sufficient grounds for believing the truth of the accounts that have come down to us, I know not any historical fact which we are justified in believing.

The CHAIRMAN.—I am sure I may offer to Mr. Forsyth the thanks of the meeting for the very interesting and learned paper which he has read. We shall now be happy to hear the remarks which any one present may have to offer upon the subject of the paper.

The Rev. G. CURREY, D.D.—Perhaps I may be allowed to offer some opinions at which I have arrived, for I have had the opportunity of reading the paper before I came here, which of course places me in a better position for commenting upon it than if I had merely heard it read for the first time in this room. I will not waste the time of the meeting by expressing my opinion on the general merits of the paper, or by pointing out those parts of it which I think are deserving of praise. In such a meeting as this, it should rather be the part of those who speak to see if there be anything which may strike them as defective, in order to give the author, in replying, an opportunity of supplying any such defects, or of showing to objectors that they really have no existence. I would say, then, that my first impression on reading this paper was rather a melancholy one; for it seemed to tell me very much that I was not to believe, and to leave very little which I was justified in believing. That is the main point which I have to bring forward, and I shall be very glad if the author in his reply will show that I was wrong in entertaining this impression. I am thankful to see that he has not failed to explain the grounds upon which the evidence for Holy Scripture rests. On that point we can have no difference of

opinion, but shall all acknowledge the clear and distinct manner in which the author has set forth our belief in the historical facts detailed in our Scripture history. (Cheers.) But, apart from this, I must say that there is left but little for us to believe, nor does it appear to me that the rules of evidence, as applicable to the credibility of history, have been as clearly drawn up in this paper as I might have desired. I should have preferred seeing them in a more distinct and clear, and perhaps tabulated form, in order that I might apply those rules to any particular case, or to any particular historian, in order to ascertain the credibility of the fact which I was considering, or of the historian whom I was examining. There appears to be in that respect, a want of clearness, owing, probably, to the scantiness of information adducible on the numerous topics introduced by way of illustration. One of the reasons which leaves this impression on my mind is, that the greater part of the paper is occupied in showing what we should *not* believe, and because there is a certain confusion between the leading facts of history, and smaller incidents contained in anecdotes, sometimes of a slight though interesting character. The laws of evidence indeed may be unalterable, but there is a difference in their application to anecdotes and to the more important facts of history. Many of these anecdotes, we are told, are not to be believed in at all, and it seems to me that in a paper in which we hope to find rules laid down to point out what we should believe, too much space has been given up to the introduction of trivial anecdotes which we are not to believe. We know that, as time goes on, small anecdotes, worthy of our attention as amusing or beautiful stories, but not to be accepted as claimants to the dignity of history, gather round great acts. Several of the anecdotes which have been given to-night seem to me to be of this kind, and appear to have been brought forward in order to be rejected. They are simply illustrations of what few will deny, that much of history, commonly so-called, is not to be received without question. I would separate anecdotes from the consideration of a subject of this kind. They are too apt to become like the fringe described in that well-known story, the "Tale of a Tub," where a coat is represented as being decorated with such a quantity of fringe, that the original material is altogether hidden by the superfluous mass of adornment. You will remember how one of the brothers carefully took off the fringe without injuring the coat, but the other tore it off with so much vehemence that he rent the coat as well. In the same way, when we are disposing of anecdotes, we should take care not to lose sight of the historical truth which lies underneath. With regard to the story of William Tell's shooting at an apple placed upon his son's head, I reject it, not simply because it appeared for the first time many years after the occurrence itself was alleged to have taken place, but also because, as Mr. Forsyth has pointed out, it appears in connection with other persons and other countries. But while I reject the story of the apple, it does not follow that I reject the story of the fact that William Tell arose as an heroic defender of liberty to rescue his country from the oppression of a foreign yoke; this is the great historical fact that

lies underneath the story of the apple, and the rejection of the anecdote need not affect the historical fact. It is of great importance that we should put aside those parts of history which form merely the adornments of its earlier days. We know that former ages were far less critical than the present, and that anecdotes then formed a considerable part of history. But we can dispense with many of these anecdotes without losing the substantial facts. I would, therefore, lay stress upon the difference between anecdote and history. Mr. Forsyth has introduced into his paper certain passages from Dr. Newman's *Grammar of Assent*; but, with regard to them, it seems to me that we ought to draw a distinction between assent to the statements of history and to propositions relating to natural phenomena; the grounds, for instance, on which we believe that the sun will rise to-morrow, or on which we believe we shall die. I do not consider that such questions bear very much on the laws of evidence as applicable to the credibility of history, and I cannot but think that the introduction of these passages from Dr. Newman's *Grammar of Assent* tends to confuse our apprehension of the laws of evidence with regard to history. These laws need to be clearly stated. The first ground of our belief in history must be, the evidence of contemporaries, as stated by Sir George Cornwall Lewis in a passage which Mr. Forsyth has quoted,—a forcible passage, no doubt, but making rather too much of an obvious truth. There is no great discovery in the fact that we must rely on contemporary information for our historical facts; but if we say that we are to believe nothing but the evidence of contemporaries, we shall destroy history altogether. We must believe those things which, although not stated by contemporaries, are stated by persons who had information which can be traced up to contemporary sources. And then the question arises, what ground is there for believing that the historian in a particular case had the means of obtaining such information? We believe, for instance, the statements of Hume in his *History of England*; for we know that he had many documentary sources of information, which he made use of.

MR. FORSYTH.—Hume is full of errors.

DR. CURREY.—I am not saying that I believe everything he said; but I say that we accept his statements as historical because we know there were many documents open to him, which he carefully examined, and therefore, on the whole, he produced a true history, though he lived long after the times of which he wrote. Errors he may have made either from carelessness or prejudice. The critic may examine and discover these, but he does not reject the whole history because it was not written by a contemporary. That is the method we pursue, I suppose, in any history. We first examine what were the sources of information which the historian had at his command. In modern history this is not very difficult, but in more remote times it is not always easy to ascertain what sources of information were open to an historian. There must have been many with which we are not acquainted, and which are not in our possession. This is clearly shown in the case of

Herodotus, who gives us a history of the Egyptian kings, going back to a remote antiquity ; and the great value of his history is that he accurately reported what he saw and heard, after making diligent inquiry. He reported the history of Egypt from the priest-kept registers which were to a great extent supplied to him when he travelled in Egypt ; and it is a remarkable fact that those registers have been confirmed in the most striking manner by the discovery of monuments, whose inscriptions we have of late years been enabled to decipher. There are many differences, but, on the whole, the general history of the kings of Egypt, particularly of the later ones, has been confirmed, and we can from Herodotus illustrate the difference between anecdote and history. Take, for instance, the Saitic dynasty which began with Psammetichus. Herodotus gives us a list of kings confirmed in a very striking manner by the monuments, and we feel quite certain that the list is correct, being derived from the records of the priests ; but while he gives us this list correctly, he fills up his history with anecdotes utterly incredible ; so that when we speak of Herodotus as being accurate and careful, we admit that he was accurate in relating what he saw, and careful in recording what he heard ; but, at the same time, we are bound to confess that he accepted almost anything he was told with reference to history. Take the case of Psammetichus himself : Herodotus gives a very true account of him as the first of a dynasty which succeeded to the sole government of Egypt after it had been divided among a number of (Herodotus says twelve) independent princes. But he gives us a very curious account how it arose from an oracle that any one who offered a libation from a brazen bowl should be king. At that time they had golden bowls ; but on a certain occasion a bowl being wanted, and none forthcoming, Psammetichus used a brazen helmet. He was suspected and driven into banishment, whereupon he rose up in revenge, overthrew the twelve princes, and so fulfilled the oracle. Now we have monumental records which confirm the fact of Psammetichus having succeeded to the throne, after Egypt had been governed by many princes ; but when we come to the story about the oracle and its fulfilment, which Herodotus either received from the priests, or invented for himself, we have no record of it at all, we have only the account of Psammetichus succeeding to the throne of Egypt, and of the princes being tributaries to the great Assyrian monarchy. There were thirty subordinates when Psammetichus threw off the yoke. So there we have a simple historical fact, and around it is a fabulous narrative. That is quite characteristic of Herodotus, whose leading facts are borne out by records, but who surrounds each fact with poetical and legendary accounts, which he accepted without much reflection. What I would maintain is this : that in determining the basis of history, we must be content with less precise evidence than in the case of natural phenomena, or in establishing occurrences of the day. We have not, and cannot have, a series of events precisely similar to each other, which would determine a truth by the law of induction, and we must often be content with the testimony of persons far removed from the times at which they

wrote. Our first step then must be to examine the genuineness of the books which profess to give us an account of what happened—in times past. But the presence in ancient histories of much which we are unable to accept, does not necessarily invalidate the whole. Often under very fable lies a substantial truth, as in the history of the Egyptian Psammetichus. It is the province of the student of history to exercise his faculty of discrimination, to separate the substantial facts from the accidental and sometimes fabulous anecdotes by which they are accompanied, and to be careful to weigh the relative importance of different parts of a narrative. It may be doubtful whether Wellington at Waterloo used the words, "Up guards and at them"; but there is no doubt that the battle of Waterloo was fought and was decided by a final charge of the British Guards. Anecdote sometimes is purely ornamental, sometimes it illustrates in a semi-poetical form the historical fact to which it is attached. The historian must distinguish between these two classes of anecdotes, and be upon his guard against viewing every part of a narrative as of equal consequence, and so confounding anecdote with history.—Were certain books really written by the historians whose names they bear? This generally depends on the recognition of those works by a series of writers from a very early time. We must then examine as to whether it was probable that the historian had access to information which might be derived from contemporary sources. After this we must examine the character of the historian, and see whether he was likely to be honest, or whether there were any motives to induce him to disguise the facts; and then we must see whether he had the faculty of really understanding and interpreting the documents which he examined. The laws of evidence, therefore, require us to see first, what sources were open to the historian; secondly, whether he was capable of making proper use of these sources; thirdly, whether his character was such as to lead us to suppose that he would use them with ability and honesty, and on this point we must judge in a great measure from the internal evidence supplied by the books themselves. Then, fourthly, we must examine the facts themselves, and see if they are such as seem to be consistent with what followed upon them. Do they give a good account of institutions that rise up in consequence, and are they consistent among themselves? Fifthly, we must see, if possible, whether there is any concurrent testimony. These seem to me to be the leading points which affect the laws of evidence with reference to history. (Cheers.)

The Right Hon. STEPHEN CAVE, M.P.—I have not had the same advantage which the Master of the Charterhouse had, in seeing the paper before I came here; but still I should like to make a few observations on the subject. I think that a great deal of what has fallen from Dr. Currey is true criticism, but I also think that he has rather underrated the value of anecdote in history. (Cheers.) The fact is, if you go back to the Old Testament, the oldest of all histories, you find it is made up of anecdote; and history generally, as accepted by the bulk of the people, is one mass of anecdotes, some of which are most valuable. That, I think, is a point which Mr. Forsyth intended to bring out in his paper; at all events, it struck me. We

know perfectly well that what he wanted to show was that many anecdotes currently believed in cannot be true, while many others which appear to be impossible, and which bear much upon history, are really true. In other words, he says:—"Oh, infidel, great is thy faith! You believe things which are in themselves absolutely incredible; but you reject those things which are really capable of proof!" Lepsius, the Prussian, who wrote on Egypt and the Holy Land, says, in speaking of the Israelites on their journey to Palestine, that they lived upon manna, which he describes, not as "angels' food," but as a natural exudation from the tamarisk. Fancy the absurdity of supposing that two millions of people could have existed upon the exudation of the tamarisk, which would not have served one half of them for one day's luncheon. (Laughter.) This shows how credulous a sceptic may be on certain points. Then you may find anecdotes, which apparently at first sight are very incredible, and yet, on examination, are capable of almost perfect proof. Anybody would suppose that the house of Simon the tanner in Jaffa would have perished out of the memory of man; and yet, as Dean Stanley says, there is hardly any tradition which is so perfectly authenticated as that which points out the site of Simon's house. A tanner requires fresh water for carrying on his trade, and there is only one well of fresh water in Jaffa, and that is in the courtyard of the house which is pointed out as the house of Simon the tanner, which must necessarily have stood there, unless, indeed, an earthquake had altered the face of the neighbourhood. Then, there are many traditions which we know are not true; take, for instance, the traditions with regard to our Saviour, and His appearance, and many circumstances which took place soon after His death. We reject altogether the miracles which He is said to have performed as a child, such as making clay birds and bidding them fly. We reject these things because they are childish, and there is no object in them. Again we have had handed down to us the idea of our Saviour's face and of His appearance, derived very much from a bas-relief which was supposed to have been sculptured in very early times,—at the time of His death, indeed,—and sent to Tiberius by Pontius Pilate, but, falling into the hands of Saladin, it came into Europe after many vicissitudes. It was carved on an emerald. I have also seen a bronze medal with a similar profile, of which nearly the same story is told. But we know that for many centuries after His death there was no likeness of Him at all, and that His disciples rather avoided touching on His crucifixion, which they considered a very degrading punishment; and in all the catacombs and the famous mosaics at Ravenna you find allegorical representations, but no portrait of our Lord as an individual until 300 years after His death, and then it first occurs in the catacomb of St. Calixtus at Rome. We find that there is no proof whatever of the monkish traditions with regard to the early ages after the life of our Saviour. Again, take the case of Herodotus: we acknowledge that he was an historian who intended to speak the truth so far as he knew it, notwithstanding that he is called "the father of lies." He no doubt recorded an immense number of lies; but he said, "I do not say these things

are true : I did not see them : I simply say what the priests told me." We find something of the same sort in quite modern history. Most of you have read the book of Huc and Gabet, the Jesuit travellers, who went through China and Thibet into Russia. They accurately record what they saw, but they also speak of things which we consider impossible, though in those cases they carefully abstain from saying that they saw what they describe. But, unfortunately, they went from Paris before their work was published, and gave their manuscript into the hands of a publisher who thought he would give the public something sensational, so that they would be the more likely to buy the book. In one remarkable instance in which the travellers were referring to the sacred tree of Thibet, they were made to say that they saw the sacred verses growing upon the leaves and upon the bark of the tree, and, of course, every one was ready to say, "These men are deceivers." It turned out, however, that nobody was more astonished at the story than the authors themselves, who had merely given it as a story which they had heard from the priests, but whose publisher had omitted that important qualification. This shows how difficult it is, after the lapse of a number of years, to find out what is the truth of the historian, and how far he has been misrepresented, or how far he has been misled. Nobody knows who wrote *Ossian*, and it is doubtful whether Rowley's poems were written by Chatterton, or by some one else. On the last page of this paper Mr. Forsyth has laid down a great many canons for the belief or disbelief of history, and I think he has laid them down in a satisfactory way ; but if we are to take the testimony of contemporary writers, I would ask every one to take the history of the last ten years, as written by the *Standard*, and as written by the *Daily News* ; and I maintain that nothing which Lord Macaulay has said about the Duke of Marlborough or William III. would differ from any other author more than the writers in these two newspapers differ from each other, and yet, for want of anything better, we must take them as the historians of the present day, for future times. What I desire to show is that the reception of anecdote in certain cases goes a great way to prove what is the belief of the people with regard to the history of their times, but I admit it does not follow from this acceptance that that history is true. There is an instance in the time of Pope Leo X. : some people went from Spain to that Pope, and told him that they had found a new saint, and had got his grave-stone, on which was inscribed his name, St. Viar, and they wished him to be canonized, as it was quite proper that he should be added to the calendar. Pope Leo, who was much more learned than most of the men of his age, had never heard of St. Viar, and doubted the whole case exceedingly ; but he sent competent people into Spain to investigate the matter, and obtain information. I dare say you all remember the case of "Bill Stumps, his X mark," in *Pickwick*. (Laughter.) Well, the case of St. Viar turned out to be something like it. They found on a large stone the letters "S VIAR," and they saw at once that it was a piece of an old Roman mile-stone, which had been signed by somebody who held the post of Prefectus Viarum, but all the letters had

been worn or broken away except five. (Laughter.) Would anybody who accepted that anecdote as historical be a good judge of the truth of the history of those times? I think not. I believe it was Walpole who said: "Do not read me history, because that must be false," and there is a certain amount of truth in that. You cannot go back to the time when some histories were written and find the crass ignorance which then prevailed, without feeling a considerable doubt as to what was accepted as history in those days, without even taking into account the personal danger incurred by those who ventured to take a view opposed to that of the government of the day. Perhaps the most reliable evidence in former days is derived from the drama, especially from comedy—from Aristophanes down to our own day; plays, which are subjected to contemporary criticism of all parties, are most valuable adjuncts to tests of contemporary history. I think we ought all to feel very much obliged to Mr. Forsyth for his paper, and also to Dr. Currey for the able speech which the paper has called forth from him.

The CHAIRMAN.—I hope we shall have the advantage of hearing many speakers this evening. We have already had some valuable remarks on historic anecdote; but we must not forget that the subject of the evening is upon the rules of evidence.

The Rev. Prebendary C. A. Row.—I think the meeting is in considerable danger of missing the subject of discussion, which is the rules of evidence that are to be applied to the credibility of history. I think Mr. Forsyth has pointed out with sufficient distinctness, first, that history must be founded on contemporary testimony; and secondly, that all those things which are now called history, but concerning which we have no knowledge that they were founded on contemporary history, must fall to the ground. In a paper which I read myself, on the same subject, some twelve months ago,\* I confess that I failed on one point, and I do not think Mr. Forsyth has supplied the defect. I failed from not knowing how to lay down a canon as to how far the principle of historical conjecture may be legitimately applied in the reproduction of history. I satisfied myself that there is a vast amount of conjecture which has been introduced into history without warrant, and has been propounded as representing real and positive facts. Dr. Currey mistook me on that occasion as absolutely denying that the principle of conjecture is applicable to historical inquiry; but that was far from my view. My point was, how far may we go in that direction? And it is a point of the deepest interest, because it is on that ground that all the sceptical criticism of the Old and New Testament is based. I have just been reading, with much interest, the last published work of Renan; it is, really, a history of Christianity from the year 60 to the year 75, and contains a number of facts, which the author has managed to unite by a considerable amount of historical conjecture. But this is the point which presents itself to my mind,—How can I dis-

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\* Vol. vii. p. 287.

tinguish facts from fictions, and how far is the conjecture valid.\* Let me take an example which will show that historical conjecture is valid within certain limits. Whoever has read the first epistle of Clement knows that it contains an obscure passage referring to the death of Peter and Paul, and ascribing it to envy. I candidly confess that I never could conceive what the writer referred to. But Renan has gone over the ground, and I think he has dispelled the doubt as to what was meant: there was an enormous amount of Jewish influence at the court of Nero; the empress was a Jewess, and many others at the court were Jews. He has shown the danger which the Christians were under of being accused of seeking to overturn the established worship; but he points out that those charges would have fallen with equal weight upon the Jews. Why, then, did Nero persecute the Christians and not the Jews? Renan has solved that question by showing that the Jewish influence at the court caused the accusations to fall only on the Christians, and that the Jews were actuated by feelings of envy. I think that is a very fair instance of what may be called legitimate historical reconstruction. There are many other cases to be found in Renan's book, but I cannot deny that that principle of historical reconstruction is also employed to establish several points which are of the greatest danger to us. All this is done by Renan with the greatest degree of plausibility, and I should have been glad had Mr. Forsyth done something to aid us in judging as to when we may rely upon these historical conjectures, and under what circumstances we must reject them.—It is astonishing to find what a large amount of history is sometimes reconstructed from a very small quantity of isolated facts.—On one point, however, it is satisfactory to find that Renan has set himself in opposition to the German critics, by denying that it is possible to write history on *à priori* principles. This is a most important point, because, as you are aware, all the great German critics construct history upon *à priori* principles, and it is a very satisfactory thing to see that Renan emphatically denounces this method. He admits that eight of the epistles of St. Paul were written by him; two more he is in doubt about, but the others are authentic, and were certainly written before the year 70. This is a great concession from such a writer as Renan, who, while he fully admits that it is impossible to reconstruct history on *à priori* principles, and that the Germans who have attempted it have only reproduced the subjective creations of their own minds, I regret has not carried that principle out throughout his own work. It is of great importance to get some light on this point, namely, as to how far in the dark periods of history one may be entitled to go upon historical conjecture, and how far historical conjecture is valid. Many modern historians have dealt largely with that principle in applying it to secular history; but in writing ecclesiastical history it is enormously prevalent, and we are much in the dark as to what was the real nature of

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\* In the Annual Address for 1874, Dr. Thornton has commented upon this mode of dealing with history.—ED.

the ecclesiastical history of the first three centuries. It has been written through the spectacles of narrow views, and we have as many ecclesiastical histories as there are narrow views. We want a thoroughly critical analysis of the evidence on which a great deal of what is called the history of that time rests. We have much evidence that we can trace to distinctly conjectural sources, and we ought to be careful in ascertaining how far the evidence rests upon direct historical testimony. Dr. Currey is fearful lest a large portion of so-called history should be consigned to the grave; but it is better to do this than to set up myths and call them history.

The Rev. J. SINCLAIR.—It is difficult to speak upon such a subject as that before us with precision and scientific accuracy. What we want is some test whereby we can determine the truth or falsehood of some events alleged to have taken place in the past. That is the desideratum, and my impression on listening to this paper is, that it contains an answer to that question, but that it does not put the answer in a sufficiently definite form. This may seem a bold statement to make, but I hope the author of the paper will excuse it, as I am simply expressing the feeling produced on my mind by the paper. There is one point which has been distinctly enunciated, both in the paper, and more or less in all the comments upon it, and that is, that the proper evidence on which to believe a statement with respect to anything alleged to have taken place in the past, is the testimony of witnesses who are competent, from their ability, their opportunity, and their honesty, to bear witness to the point. So far we have got something positive and satisfactory, but we require a great deal more than that, in order to test the accuracy of an historical statement. In the first place, we want evidence as to the moral and intellectual competence of the witnesses. We are not personally acquainted with them: none of us have had an intimacy with Thucydides, with Herodotus, with Livy, or with any other of the old historians. We want some evidence of the old historians; we want some evidence of their intellectual and moral capability of testifying as to those matters of fact with which they have dealt, and anything which can be discovered as to the characters of such men, and which throws light on their mental or moral character, assists us in judging how much credit we may attach to their testimony. This only indicates the direction in which the historical student has to look for the grounds of rational belief. Another question is suggested to the mind of one who stands in this attitude, and that is: How do we know that these statements were actually made by the person whose name is attached to them? How do we know that they are the genuine statements of Herodotus or Livy, or any one else, when we had not the privilege of seeing them make the statement? We must look for evidence in confirmation of this, and that points to another line of inquiry. Anything which tends to prove that a book was actually written by the particular person whose name is affixed to it, helps us in forming a rational judgment as to the trustworthiness of that history; there has not been much allusion to these

matters in the paper. But I come to some things of great importance which have been stated with considerable clearness. As confirmatory of such statements as may constitute the body of a particular author, Mr. Forsyth has said that the consistent and concurrent testimony of independent witnesses adds very much to the claim of such testimony upon our belief; and I would add to this unquestionably correct canon, that if it is known that those witnesses are not only independent, but of an opposite bias, there is much greater reason for giving credit to their statements. For example, if we should discover some statement with respect to a matter of fact made both in the *Standard* and in the *Daily News*, the fact being one in regard to which they had some inducement to take an opposite view, nothing could be more conclusive than that such evidence related to an absolute fact. Another thing mentioned is the recognition of such statements in contemporary authors, besides those who have actually advanced or expressly made them. The allusion of a contemporary author to a statement as embodying a fact, is a very great confirmation of that fact, upon whosoever authority it was originally made; and sometimes the more delicate and indirect the allusion, the greater is the evidence it affords of the historical truth of the statement. These are the primary and essential grounds of historical truth—conditions which our intellect and reason must demand as the grounds of belief in any statement with respect to the past. My only complaint with regard to the paper is, that it does not distinguish, with sufficient clearness, between the primary evidences and those which are indirect and secondary. Reference has been made, with great propriety, to the truth-likeness of a statement; its consistency with general experience, and with known and admitted facts, whether ascertained by our own experience, or sifted and tested and established by others. Then, the moral tone of the authors; the consistency of the statements with the characters of the persons by whom they were made; and the apparent motive with which they were made: these things, taken together, constitute a very formidable body of internal evidence, which, in the absence of external evidence, have almost conclusive weight in the mind of any intelligent inquirer. That of which I complain in the paper is that it has not, with sufficient precision and definiteness, and not in sufficiently logical order, stated these canons of historical credibility, if I may so call them, and thus put the matter before us in a way which we could remember, so as to be able afterwards to make proper use of the conclusions to which the arguments of the paper really lead. One word with regard to the question of the last speaker, as to the use of historical conjecture. It seems to me that the past and present make, in combination, what you may call historical phenomena,—facts about which the mind is naturally curious and desirous of explanation. Now, according to my view, it is just as legitimate for the student of history to form a theory by which these phenomena or facts may be accounted for, as it is for the student of natural science to form a theory which accounts for the phenomena of nature. Such theories are called provisional, or working theories, and, as such, they are of great value; and, if we

keep their true use and value in view, theories of conjecture are just as valuable with regard to civil or political truth, as they are with respect to science. (Cheers.)

Mr. FOSSYTH.—I will detain you with very few remarks in reply. With reference to what was said by Dr. Currey, who complains that I have devoted too much attention to historical anecdotes, if he looks at the paper again, he will find that there is but one page of anecdotes, and there are twenty-one pages devoted to the rest of the subject. I have to thank my right hon. friend, Mr. Cave, for his defence of the use of anecdotes in history. You will find that many so-called historical facts to which we attach importance, are simply anecdotes. Let me mention one case,—that of the Treaty of Utrecht; it is said that that treaty was made by the Tories because Mrs. Masham spilt a cup of tea on Queen Anne's gown, whereupon Queen Anne, in a pet, quarrelled with the Whigs, and went to the Tories, which led to the Treaty of Utrecht, and changed the face of Europe. It is objected that I did not in my paper lay down, in a tabulated form, the canons of historical criticism. I did not do so, because nothing is so dull and repulsive as such a tabulation. It is all very well for the blue-book of a statistician; but in the paper I thought it out of place. I am happy to say that every single rule which has been suggested by Dr. Currey and Mr. Sinclair, will be found implied, and even stated and illustrated, in the paper. Not one single rule has been suggested which is not to be found in the paper. Only one other remark; Dr. Currey has said that my paper has supplied him with nothing to go upon. I am very sorry for it; but I do not think it is so useful to tell people what they are to believe, and to make them as credulous as possible with regard to the history of the past, as to caution them with reference to the kind of evidence they ought to rely upon, and with regard to what they ought to believe. We have lately had a most humiliating spectacle in England of the credulity of mankind. I would not have alluded to it for one moment if the trial\* had still been going on, but to me nothing has been more humiliating as regards the British public, than to find that for a period of two years and a half it has been possible to keep up a gross and gigantic imposture, when the whole question was a question of evidence and perfectly germane to the subject. Minds which are accustomed to deal with and to weigh evidence—conflicting evidence—in evenly-balanced scales, could have had no doubt as to the result. In every case that can be mentioned, or in almost every case, there are arguments for, and arguments against. As Dr. Johnson said, there are arguments for a *plenum* in nature, and arguments for a *vacuum* in nature, but there must be either the one or the other. Let us illustrate this by the case in question. A man is said to have perished eighteen years ago. After twelve years have elapsed, a man comes forth and says:—"I am that man, and have risen, as it were,

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\* The Tichborne Trial.

from the grave. I am one of eight men who were saved from the ship that was lost. Those eight men, including myself, were taken on board another vessel, where there were twenty-three men, and these twenty-three men took us to the port of Melbourne, where we were all landed safe and sound. I now come forward to claim the estates." But not one single living soul ever heard of any one of those men, or ever had a line from them, and from that hour to this there has been a dead, unbroken silence with regard to these thirty-one men. Now I say that any man who could believe that story, because this claimant remembered a number of trifles, has just that want of the proper knowledge of the principles of evidence which belong to a man of a very low condition of intellect. The habit of testing evidence, and of being sceptical, is rather more important than the habit of swallowing evidence without examination. (Cheers.)

The Meeting was then adjourned.

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## ORDINARY MEETING, APRIL 13TH, 1874.

J. ELLIOT HOWARD, ESQ., F.R.S., IN THE CHAIR.

The Minutes of the last Meeting were read and confirmed, and the following Elections were announced :—

ASSOCIATES :—Bisset Hawkins, Esq., M.D., F.R.S. (Life), 146, Harley Street ;  
John Rendall, Esq., M.A. (Barrister-at-law), 9, New Square, Lincoln's  
Inn ; and Rev. E. W. Fenwick, M.A. (Cantab.), Rectory, Bridport,  
Exeter.

Also, the presentation of the following works to the Library :—

- “ Transactions of the Geographical Society.” Part 2, vol. xviii. *From the Society.*  
 “ Transactions of the Syro-Egyptian Society,” 1 vol. *From the Society of Biblical Archæology.*  
 “ Transactions of the Chronological Society,” 1 vol. *Ditto.*  
 “ The English Institutions.” By P. Vernon Smith, Esq. *From the Author.*

The following Paper was then read by the Author :—

*THE PRINCIPLES OF MODERN PANTHEISTIC AND  
ATHEISTIC PHILOSOPHY, as exemplified in the last  
Works of Strauss and others.* By the Rev. C. A. Row,  
M.A., Prebendary of St. Paul's.

THE following passage from the *Autobiography of the late Mr. J. S. Mill* demands the earnest attention of all those who believe that there is a personal God, who is the moral governor of the universe:—"The world would be astonished if it knew how great a proportion of its brightest ornaments—of those most distinguished even in popular estimation for wisdom and virtue—are complete sceptics on religion, many of them refraining from avowal, less from personal considerations, than from a conscientious, though now in my opinion most mistaken apprehension, lest by speaking out what may tend to weaken existing beliefs, and by consequence, as they suppose, existing restraints, they should do harm rather than good."

2. The first question which strikes the mind on reading this passage is, is the assertion true, "that a large proportion of the 'world's brightest ornaments' are complete sceptics on religion"? If so, it is of the most serious import. Mr. Mill has probably exerted a greater influence in the higher regions of thought than any writer of the existing generation. No holder of his philosophy can any longer entertain a doubt that certain portions of it are the philosophy of scepticism. The peculiar idiosyncrasies of mind which the *Autobiography* discloses, may have led Mr. Mill somewhat to over-estimate the sceptical tendencies of others. Yet the large number of writings, which have been recently published, of a similar tendency, is a sufficiently clear evidence that the principles of a pantheistic or atheistic philosophy are widely diffused among cultivated minds. Strauss, in his recent work, distinctly affirms that he is only acting as the spokesman of a wide range of pantheistic thought.

3. I quite concur with Mr. Mill in opinion, that the time is come for speaking out plainly. In fact, unless morality is nothing better than expediency, there never has been a time when it has been right to profess adhesion to a system of thought, which in secret we utterly despise. I fully concede that theologians no less than philosophers would do well to act

on this opinion, and not to have an exoteric doctrine for the vulgar, and an esoteric one for themselves. But it is with the latter that I am now dealing. A sound philosophy requires, that the too frequent example of the ancient philosopher, who acted the part of the high priest of the god whose moral character he despised, and whose existence he disbelieved, should be utterly repudiated. What can be more degrading than the spectacle of an atheist Cæsar, dressed in the pontifical robes, uttering solemn vows to Jupiter in the Capitol? Persons capable of acting such a part must have a supreme contempt for the vulgar herd of humanity; and are at one in principle with the priests whose conduct they denounce. It is satisfactory to be informed that in the opinion of Mr. J. S. Mill, his father's prudential principle of not avowing his opinions to the world "was attended with *some* moral disadvantages." The italics are ours; in place of "some" we would read "great."

4. Before entering on the consideration of some of the principles of pantheistic and atheistic philosophy, to which I propose drawing attention in the present paper, it will be necessary to state what Atheism, as held by men of culture, really means. The son's account of the character of his father's atheism will clearly define its nature. "Finding," says Mr. J. S. Mill, "no halting-place in Theism, he yielded to the conviction, that concerning the origin of things nothing whatever can be known. This is the only correct statement of his opinion, for dogmatic Atheism he looked on as absurd, as most of those whom the world have considered atheists have always done." Atheism, therefore, as a philosophic theory, does not consist in the denial of the being of a God, but in the affirmation that there is no evidence that there is one. The moral value of the distinction between these two positions is *nil*, but the intellectual one is great, for it frees him who entertains it from the necessity of proving a negative.

5. The following is worthy of quotation, as an illustration of the nature of the elder Mill's atheistic reasonings. "He impressed upon me from the first that the manner in which the world came into existence was a subject about which nothing was known; that the question, 'Who made me?' cannot be answered, because we have no experience or authentic information from which to answer it; and that the answer only throws the difficulty a step further back, since the question immediately presents itself, 'Who made God?'" It is almost incredible that such reasoning could have commended itself as valid to a man of the mental acuteness of the elder Mill; and it is

quite a relief to be informed by the son that his father's atheism was rather moral than intellectual.

6. I now proceed to examine some of the philosophic principles on which modern Pantheism and Atheism are based; and, first, their principle of causation. It is an accepted dogma of the Positive philosophy that a cause is nothing but an invariable sequence between an antecedent and a consequent, and that the notion of any efficiency in the cause to produce its effect is a fancy which has been exploded by the discoveries of physical science. This opinion is the natural outcome of a philosophy which teaches that the whole of objective nature, and even the fundamental principles of the mind, are nothing else but a bare succession of phenomena; and that a knowledge of any truth objectively valid for all time and space is unattainable by man.

7. It strikes one at first sight as a strong objection against such a system of philosophy that language has been formed on the assumption that it is not true. Its forms embody the universal experience of mankind, and have grown out of that experience. Now, nothing is more certain than that whenever we use words denoting causation we mean by them something very different from the mere invariable following of a consequent on an antecedent. If this is the true idea of a cause, nothing is more misleading than human language; for it is impossible to express the conceptions of this philosophy in it except by using it in a non-natural sense. One of the first duties which it owes to truth is to revolutionize human language, for, in its present forms, it is incapable of being the vehicle of accurate thought. If, therefore, this philosophy is a true representation of ultimate realities, one of its first duties is to attempt to construct a language capable of expressing them. At present it is a strong argument against the truth of this system of philosophy, that a few philosophers are committed to a particular theory on the one side; and, on the contrary, is the universal experience of mankind, as testified by the fundamental structure and the forms of language.

8. This philosophy also carries out to its utmost limits the doctrine of the relativity of human knowledge. Of this Mr. Mill is one of the strongest advocates; he even considers it possible that in some distant region of the universe, two and two may make five. Beyond this, it seems impossible to push the doctrine in question. Such an affirmation is a strange one to be made by a philosophy, which professes to ground all human knowledge on experience, for it certainly transcends all experience. Next, it is directly contradictory to the principles of at least one science. Astronomy has penetrated into regions of the universe immeasurably

remote. Its calculations are based on the assumption that in the remotest regions two and two make four; and if any region existed in which they did not make four but five, the whole of its apparatus of calculation would be subverted. Next, the assertion that two and two make four and not five, is a truth self-evident to the mind as soon as it is capable of comprehending the terms. It is marvellous that any man should have made such a statement. What is two?  $1 + 1$ . What is four?  $1 + 1 + 1 + 1$ . What is five?  $1 + 1 + 1 + 1 + 1$ . It is therefore evident that the proposition  $2+2$ , *i. e.*  $(1+1) + (1+1)$  must make 4, *i. e.*  $1 + 1 + 1 + 1$ , and not five, *i. e.*  $1 + 1 + 1 + 1 + 1$ , must be valid for all thought, all space, and all time, and that to affirm the contrary is to assert the possibility of contradictions being true. It follows, therefore, that all our knowledge is not relative.

9. If all our knowledge is only relative and phenomenal, on what does our belief in the existence of an external universe rest? It will be answered, on experience. But what renders such experience valid? How do we know that any sensation or mental conception has anything to correspond to it outside our minds? This cannot be the result of experience alone, for all that we are actually cognizant of are certain mental states. Yet our belief in the reality of an external world is so strong, that it cannot be shaken by any amount of reasoning. Moreover, it is no mere result of a balance of probabilities, but it is a firm and ultimate persuasion, on which it is impossible to avoid acting. If the alternative of idealism or materialism were presented to our minds as a matter of abstract reasoning, the balance of the evidence would turn in favour of idealism. Still we cannot help believing in the reality of an external world, and we shall continue to do so despite of all philosophy.

10. To say that this belief is derived from experience is to beg the question at issue, because there must be something to give validity to the primary experience; and which has enabled us to infer from some primary act of sensation, the externality of the cause producing it. The only possible account of our belief is, that there must be some principle in the mind (be it what it may) independent of sensation, which compels us to believe in the externality of the cause producing it. This power may be called into activity by an act of sensation; but it is impossible that it can be its mere result. Such beliefs the mind pronounces to have a universal validity. Of a similar character are the great truths which lie at the foundations of our reasonings. It is impossible to conceive of them as true in one place and not true in another. It is impossible, therefore,

to view them as the mere result of our experience of phenomena.

11. Of a similar nature must be our idea of causation. Its primary conception is unquestionably derived from our own self-consciousness. Experience may aid in its evolution; but it is impossible that it can have originated it. All that we can have experience of is, a succession of events one following the other in which we observe no variation. We advance one point beyond experience, when we arrive at the conception of an invariable succession. Yet there are innumerable successions which are in no sense causes. It may not be possible fully to develop the idea in the formal intellect. But we know it, we believe in it, we feel it; it lies at the foundation of our reason.

12. But further, it is not strictly true, that whenever there is an invariable antecedent and consequent, the one is the cause of the other: day and night stand to each other in the order of an invariable antecedent and consequent, and they must have done so from their first origin. Yet the absurdity of affirming that the one is the cause of the other is apparent. Many instances of invariable antecedents and consequents exist which it would be absurd to designate causes. It follows, therefore, that a cause must be something more than an antecedent, followed by an invariable consequent.

13. Our primary idea of causation has been unquestionably derived from our own self-consciousness, and has thence been transferred to the forces of external nature. Our conception of ourselves as voluntary originators of actions constitutes our only adequate idea of a cause. The consciousness that we are capable of originating actions forms one of the highest of our certitudes. It is one which is anterior to all reasoning, and forms the groundwork of its possibility. We know that our volition sets an entire chain of antecedents and consequents in action. We are certain that they derived their impulse from a voluntary act of our own, without which they would have had no existence.

14. Let me illustrate this by an example. Let us suppose a city to be blown to pieces by applying a match to a barrel of powder in a large magazine. It is incorrect to say that the match is the cause of the explosion. The true cause was the voluntary act of the agent who applied the match. No other of the agencies adequately satisfies the idea. But are the other unconscious forces which bear their part in the work of destruction nothing else but bare antecedents and consequents? Does it satisfy our conception of a physical force,

when it is in active energy, to describe it as such, and nothing more? I contend that it does not. What follows the ignition of the match, and its application to the barrel? The calling into activity of a number of forces, which are adequate to effect their destructive work. Are they nothing but antecedents? The mind refuses to regard a bare antecedent as fulfilling its conception of a force.

15. What is the real state of the facts? A volition determines on the action; and the understanding suggests the means adequate to accomplish it. The volition sets in action the bodily apparatus of nerves, muscles, &c. These kindle the match by friction. The match ignites the powder in the barrel, and liberates its forces; the barrel, the entire magazine. The explosion calls into activity a terrific force: this occasions a concussion of the atmosphere: the concussion effects the details of the work of destruction.

16. In a popular sense all these things are designated causes. Some of them are evidently more than bare antecedents. They are forces in energy. The conception of such a force implies the presence of a power adequate to effectuate the result. If it be urged that the force and the result are necessarily united together as antecedent and consequent, a true philosophy is bound to account for that necessity. It cannot be given by experience; and is something different from a mere phenomenon. If we affirm that the necessity is the result of a primal law, then we have arrived at the existence of a truth which must have a universal validity independently of phenomena.

17. Now, a necessary law cannot be arrived at as a bare result of experience, or have any place in a phenomenal universe. It is only conceivable as inherent in something underlying phenomena. It follows, therefore, that whenever a pantheistic or atheistic philosophy postulates the existence of necessary law, without which it cannot advance a single step in creating the universe without a God, it is compelled to admit the existence of truths valid for all space and all time; and thus to subvert the foundation on which it rests. How can we affirm that such exist in a universe in which we can know nothing but phenomena? If there be none other, philosophy must be impossible.

18. A system which refuses to take cognizance of the facts of consciousness, and to probe them to the bottom, must be necessarily one-sided. It is true that they cannot be weighed in scales, or measured by the finest instruments; which a certain class of thinkers assert to be the only criterion of truth.

Yet we can have no higher certitudes than these. If they are not certitudes, none other can be; for unless they are such, experimental knowledge is impossible.

19. But further: while this philosophy affirms that all our knowledge is the result of experience, and that we have only experience of phenomena, a modern form of it endeavours to escape from the difficulties in which it is encircled, by allowing that the experience may not be that of the individual, but the inherited experience of the race. Accordingly, it affirms that that portion of our knowledge which appears to transcend experience is really the result of a transmitted experience, derived from a long line of ancestors. How this relieves us from the difficulty it is difficult to see.

20. To deal with such a question adequately would render it necessary to discuss the relation between subject and object. This alone might well occupy an entire volume. Still, without entering into these depths, there are a few obvious facts which will be sufficient to test the truth of the position which this philosophy seeks to establish.

21. First. The assertion that all our knowledge is phenomenal, and that we are incapable of arriving at any knowledge of universal objective validity, is absolutely suicidal. The most sceptical philosophy would be still-born, unless there was some one truth which is not of this description,—viz., that which affirms the universal validity of its own assertions. Unless it was objectively valid, universal scepticism must be the result; otherwise it might be true in one part of the universe, and not true in another. So, again, the affirmation of our reason that one of two contradictory propositions must be false, must be a knowledge which transcends experience, and be universally valid. To affirm the contrary would destroy the basis on which even the most sceptical philosophy must rest. Again: it is affirmed by a popular form of philosophy, that all propositions which transcend the phenomenal are unknowable; into which region it banishes the conception of a God. If it be so, it follows that this proposition must possess a universal objective validity independent of the subject which affirms it. Some knowledge, therefore, must be attainable which transcends experience. Even Pyrrhonism is compelled to affirm that one truth exists which is universally valid,—viz., that all truth is impossible.

22. When God is banished by this philosophy into the regions of the unknowable, it confounds under a common name a number of conceptions entirely distinct; and boldly affirms that they all alike transcend the powers of rational thought.

The only ones which do so are those, the truth of which is positively unthinkable. Others vary greatly in distinctness and adequacy; but the fact that we habitually think and reason on them proves that they lie within the limits of rational inquiry.

23. Again, as far as this question is concerned, to affirm that many of our certitudes are not the result of the experience of the individual, but of his remote ancestors, is to transfer the difficulty, but not to solve it. I ask, on what did the primary experience of our remote ancestors rest? What gave it validity? However small its results, it must have possessed some principle, which rendered it possible. Let us suppose, for the sake of argument, that the affirmation, that things which are equal to the same thing, are equal to each other, is the result of a gradually accumulated experience, which, after repeated transmissions, now exhibits itself in our minds in the form of an intuition. Does this account of it as the result of a transmitted experience give any account of the primary conception of equality; or of the affirmation, that when two things are equal to the same thing they must be equal to one another? Does it inform us, how the power of comparison between two equal things originated? The being who could thus compare must have been separated from one who could not—not by a small interval, but by a wide and deep gulf. Will the tracing it through myriads of years help us to dispense with a commencement of the conception? The only possible account of the matter is, that there must exist some fundamental principle in the mind, which enables us to see that it must be objectively valid for all time and all space. I do not deny that experience may be the medium through which such a power may be called from a dormant into an active state. Yet this does not affect the proof that some truth must transcend experience. Were it not so, all universal affirmations would be impossible.

24. Further: some principle must exist in the mind, which is the foundation of its conviction that past events, when the conditions are the same, will repeat themselves in the future. Unless this be so, the affirmation of universal law, embracing alike the past, the present and the future, would be invalid. It is impossible that it can be given by experience alone.

25. It is evident that every affirmation respecting the future must transcend experience; for experience can be only of the present and the past. The future has not yet existed, and therefore experience of it is impossible. How, then, have we arrived at the belief that the future will be like the past? To put the question into a concrete form. How are we justified

in inferring, because the sun has risen every day of our past lives, that it will rise again to-morrow? It has been urged that our experience of the past, and that of others, justifies us in inferring that the future will be like the past; that the past events of our lives were once future, and that from their having taken place, we are justified in inferring that similar ones will take place hereafter.

26. It is evident that this belief does not in any respect participate in an axiomatic character. The contrary of it is quite conceivable. Thus we are fully able to conceive the possibility that the sun may not rise to-morrow; though we feel perfectly certain that it will. So firm is our conviction that events, under precisely similar circumstances, will reproduce themselves, that it forms the foundation on which all human activity rests.

27. Is it possible, then, that our experience that past events have repeated themselves under similar conditions, can account for our belief that they will do so in the future? I ask, to what does experience extend? We have had experience of past events. As what was once future has gradually become the present, we have seen events, which once were future, repeat themselves. But how can this justify us in arriving at the conclusion that nature is uniform, and that they must continue to do so? Our belief that they will do so is an inference, and cannot therefore be founded on experience alone. Some principle, distinct from it, must exist in the mind, which justifies us in arriving at this conclusion.

28. Nor can it be arrived at by any process of deductive reasoning. No premiss can be found, resting on any self-evident principle, which can justify the conclusion that the future must, under similar conditions, resemble the past.

29. Let us recur to the example, that the sun will rise to-morrow. How do we know this? The answer which this philosophy gives, is that we believe it, because we have had experience that it has always done so; and that our experience has reached the point that what was once future has become past. But this can say nothing as to a future which has not yet become past. Now, it is both conceivable and possible, despite of any amount of past experience, that the sun may not rise again to-morrow; or, to put the same truth in general terms, that the blind forces of nature may suddenly or gradually cease to repeat themselves.

30. If the first man who saw the sun rise had been in full possession of his reasoning powers, it is evident that from seeing it rise once, he could have drawn no inference as to what it

would do in future. All he could have done would have been to draw the conclusion that it might rise again. Nor would two or three repetitions have justified the conclusion that it would do so. But a large number of such repetitions—it is impossible to say how many—would generate the feeling of certainty. How comes this? The only possible explanation is, that there is some principle in our mental constitution which compels us to arrive at this conclusion, and that it cannot be given by experience alone. The device of referring it to a number of experiences of our remote ancestors, which may have generated an intuitive belief in us, their descendants, as an account of its origin, only removes the difficulty without attempting to solve it. The necessity of explaining what gave validity to the original experience remains in full force. Similar reasoning applies to every axiomatic principle, and to all certainties which lie at the foundation of all valid reasoning.

31. All proof must rest on something which does not require proof. Premises cannot run up into infinity. To assert that everything must be proved is to deny the possibility of reasoning. Some premises are acquiesced in owing to their self-evidence, or to something in our mental constitution which compels us to assent to them. They must therefore possess an universal objective validity, independent of our experience of phenomena, however closely they may be connected with it. It is unnecessary to determine whether these principles are few or many: it is sufficient that they exist. Their existence destroys the basis on which the philosophy of pantheism and atheism rests.

32. We must now consider another most important principle on which this philosophy is founded, viz., its denial that the order and adaptations of nature are a sufficient ground for inferring the existence of an intelligent and conscious mind, which the philosophy of theism designates as a Personal God. The affirmation of certain systems of current philosophy is clear, and leaves no doubtful issue, viz., that we are not justified from the presence of order in nature in inferring the existence of an arranger; or from adaptation, of an adapter, or from apparent contrivance, of a contriver; or from the suitability of the means by which a definite result has been brought about to effectuate it, of a designer. In one word, it is affirmed, when we see in nature results which elsewhere are unquestionable evidences of the presence of intelligent mind, that all such inferences are invalid in the domains of nature; and that in making them we are only transferring the subjective impressions of our own minds into objective facts. On the contrary, this philosophy teaches that the order and adapta-

tions of nature are not due to the presence of conscious intelligence; but of latent unintelligent self-evolution. To put the matter broadly: it is affirmed that intelligence has not produced nature, its order and adaptations, but that nature is the storehouse from which unintelligent law and latent forces have evolved all these wonderful phenomena. Non-life has generated life; unintelligence, intelligence; unconsciousness, self-consciousness; impersonality, personality; necessary law, freedom; latent forces, moral agents. One aspect of pantheistic philosophy postulates the presence of unconscious intelligence in nature. But what is its nature, how it acts, or in what it is inherent, it leaves involved in a haziness which far exceeds that of any mystery involved in theism.

33. Let us do these theories justice. It is affirmed that our conceptions of order and adaptation are essentially human, and have no validity when they are applied to anything which is not the product of the human mind. Also it is affirmed, that all analogy fails between the works of nature and those of man; and that this renders invalid the conclusions which the theist seeks to draw from them.

34. I reply, that the objection is invalid, because, if true, it condemns us to universal ignorance. Our conceptions of law, force, and energy, are human conceptions, the creation of our own minds. If this is a reason why they must be invalid in the one case, it is no less so why our reasonings respecting them must be invalid in the other. The objection is suicidal, and one which would render all philosophy impossible.

35. But further: when we contemplate order and adaptation, we do not infer from it the presence of any particular form of intelligence, but of intelligence generally; just as when we speak of matter, time, and place, we do not confine them to the special subjects from which we have derived our conception of them; but we apply them to phenomena generally. It is perfectly true that within the range of our experience, men and animals are the only beings who are capable of producing the results of order and adaptation. We have evidence that among these, different orders of intelligence exist. We are therefore justified in concluding that different orders and degrees of intelligence may exist in regions beyond our experience; though they may differ in some respects from that of men.

36. I admit that there are a few cases in which order and adaptation have resulted from the action of that which, for want of a better term, we designate chance. Such, however, are so rare, and the instances so imperfect, that they are not worthy of consideration in the present argument. One thing is certain. As far as our experience goes, chance is only

capable of producing such results on a very diminutive scale, and after long intervals of time. Yet, the principle of chance is largely invoked in aid of the theories of this philosophy; though all experience affirms that it is incapable of producing the results in question.

37. The all-important fact to be observed is that, as far as experience goes, lucky chances have no tendency to repeat themselves. On the contrary, the occurrence of one once is a reason why we should expect it not to occur again. Whenever such a result takes place frequently, we cannot help inferring that this must be due to the intervention of mind. Let us take an example. If we were to throw up twelve dice into the air at hap-hazard, it is possible, though in the highest degree improbable, that they might all fall with their aces uppermost. But if the operation were repeated one hundred times, and the same result followed, there is no one who is capable of understanding the operation who would not draw the conclusion that the dice were heavily loaded as the highest of certitudes. The case is precisely similar with respect to the order and adaptations of nature. They are not only numerous but innumerable. It follows, therefore, that nature in every part is loaded heavily, and that that which loads it is the Divine mind.\*

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\* I am quite aware if twelve dice should fall with their aces uppermost, that, mathematically speaking, it is quite as probable that they would do so a second time, supposing the operation to be repeated under precisely similar conditions. Just in the same way, if a person held twenty bonds in a foreign loan, of which there were annual drawings, if one of these should be drawn, the chance that one or all of the remaining nineteen would be drawn at any subsequent year would be equally good, and would be entirely unaffected by the drawing of the twentieth. This, however, in no way affects my argument, which is founded entirely on experience and fact. There can be no doubt that if twelve dice were thrown up into the air, and they fell one hundred times in succession with their aces uppermost, every one possessed of common sense would consider it the greatest of certitudes that foul play had been had recourse to; or in other words, he would attribute the result, not to the action of blind forces or laws, but to the presence of intelligence. The same remark is true respecting the bonds. If a particular bondholder were to draw a prize at every drawing, and others never, the inference would be arrived at, that the whole matter was managed dishonestly, and had resulted, not from the action of blind forces acting according to invariable laws, but from fraudulent intelligence. In a similar manner, when order and adaptation are the result of the action of natural forces, and are brought about by these forces intersecting one another at the right time and place, the inference is no less certain, that such results cannot be due to the action of a number of blind forces, but to intelligence. Those against whom I am reasoning profess to found their philosophy on an ultimate basis of fact and experience. I reply to it by a conclusive appeal to the same principle.

38. It will be objected that this philosophy nowhere affirms that order and adaptation have been evolved by chance action, but by forces working in conformity with immutable law. I reply that chance is only another name for the blind action of unintelligent laws and forces, and that the only additional factor introduced by the term chance is, that two or more of these forces or laws happen to intersect one another at a time and place suitable for producing a particular result, and without which concurrence the result could not have existed. When these do so at such a time and place, that a particular effect is the result of their intersection, this is what we call a lucky chance. What I mean will be more easily understood by an illustration. Let us suppose a rock undergoing the process of disintegration. The action of water and of frost has opened in it several fissures. In accordance with another set of natural laws, the wind, or some other force, carries into them at this particular moment a number of seeds. These take root; fresh disintegration takes place. The operation is repeated; and thus the process is accelerated far more than it could have been by the action of a single force. This philosophy is compelled to invoke the aid of such lucky concurrences of forces in numbers numberless. Without them it would be powerless to impart to its speculations even the appearance of probability. In addition to this, it demands the right of drawing to any extent on the eternity of the past for an indefinite amount of time for the purpose of carrying on its operations. What is not possible in one hundred years may happen in one million. In this manner, with the bank of of eternity at command, all things are possible.

39. I submit that this mode of reasoning is not to solve the question, but to evade it. It gives no real account of the origin of those adaptations with which the universe abounds. On the contrary, there is something in the constitution of our minds which compels us when we contemplate an adaptation of complicated parts, exactly fitted to produce a suitable result, and observe that the result is brought about by the adaptation, to infer that it has been effected by the action of intelligence. Reason arrives at the conclusion that order and adaptation cannot have resulted from the action of unintelligent forces, but of intelligent mind. This will be the invariable inference, except where the exigencies of a particular theory compel those who hold it to renounce the convictions of common sense. Let it be observed that I am speaking, not of some imperfect condition of the human savage, but of the fully developed intellect of cultivated men.

40. The importance of this principle in reference to the philosophy of Pantheism and Atheism is strikingly brought before us in the celebrated work of Strauss, entitled *The Old Faith and the New*, in which he professes not simply to state his own opinions, but to be acting as the mouthpiece of a large number of German unbelievers. As this work has already gone through more than one edition in our language, besides the large number that it had previously gone through in Germany, it will be necessary to give it a special attention, for the purpose of exposing the unsound basis of its philosophy. The questions discussed in it are such that it is impossible to exaggerate their importance. They are as follows: In answer to the question, Are we still Christians? in the name of advanced thought in Germany, he answers in the negative. In reply to the question, Have we a religion? the answer is of a similar import. In answer to the question, What is our conception of the universe? his reply assumes the form of a material Pantheism, which differs in nothing from Atheism except in an illicit use of the language of Theism. Lastly, wonderful to say, in answer to the question, What is our rule of life? he announces himself a thorough-going German conservative, and utters a loud protest against the various forms of Communistic Atheism. It would appear that he and those in whose name he speaks are of opinion that the only effective mode to bar out the ocean is to demolish the old strongly-built sea-wall to its foundations, which has for ages past successfully repelled its billows, and in future to attempt to dam them out by substituting for it a thin layer of sand.

41. The faith into which the author's philosophy has conducted him, and those in whose name he speaks, is that of the existence of a Cosmos, the sum total of all being, material, mental, and moral, including all existence and its laws, but which is void of personality, which is deaf to the voice of prayer; in which the place of volition is supplied by necessary and unyielding laws; of an intelligent Creator, by a self-developing power utterly unconscious, which to man is incapable of being the object of either hope or trust; which in the course of its self-development has evolved both the individual and the race, and will crush them again beneath the heel of iron destiny. This power will, through the endless whirl of the eternities of time and the infinities of space, go on evolving fresh worlds out of the ashes of preceding ones, and endless successions of systems and of galaxies, in which we as individuals shall take no part, to be again absorbed into the bosom of the mighty infinite. At death our self-conscious existence shall perish, never to be renewed. The atoms which compose us, after having been absorbed into

the unconscious infinite, may be useful as materials for future life : but the hope and the destiny of the individual is eternal silence. To this, the only alleviation which this philosophy affords, is the consideration that while our conscious selves have utterly perished, the cosmos will go on evolving fresh forms of life and beauty throughout eternity, and will crush them again beneath the iron wheels of its chariot. No feeling of responsibility for the past need disturb us. Our destiny is non-entity.

42. Such is the general sum total—the net result which this philosophy propounds to us in lieu of Theism. A few quotations from it will place its principles in a striking light.

43. "The argument of the old religion was, that as the reasonable and the good in mankind proceed from consciousness and will, that, therefore, which on a large scale corresponds to this in the world must likewise proceed from an Author endowed with intelligent volition. We have given up this mode of inference. We no longer regard the Cosmos as the work of a reasonable and good Creator, but rather as the laboratory of the reasonable and good. We consider it not as planned by the highest reason, but planned for the highest reason. The Cosmos is simultaneously both cause and effect, the outward and the inward together." Again, "We stand here at the limits of our knowledge. We gaze into the abyss, we can fathom no further. But this, at least, is certain, that the personal image which meets our gaze there is but the reflection of the wondering spectator himself. If we always bear this in mind, there would be as little objection to the expression 'God' as to that of the rising and setting of the sun, when we are all the time conscious of the actual circumstances." After these and numerous similar assertions, the following utterance is remarkable: "At any rate, that in which we feel ourselves entirely dependent is by no means merely a rude power, to which we bow in mute resignation; but is at the same time both order and law, reason and goodness, to which we surrender ourselves in loving trust. More than this, as we perceive in ourselves the same disposition to the reasonable and the good, which we recognize in the Cosmos; and find ourselves to be beings by whom it is felt and recognized, in whom it is to become personified; we also feel ourselves related in our inmost nature to that on which we are dependent; we discover ourselves at the same time to be free in that dependence, and pride and humility, joy and submission intermingle in the feeling for the Cosmos."

44. Such is the substitute which this philosophy provides for

a personal God. We are to feel all this for a being (if an infinite Cosmos can be called a being) who has neither personality, intelligence, nor will, who is the prey of inexorable law, who is incapable alike of affection and of thought; who, if he has children, has not made a single provision for their wants, cares not for them, and in due time inexorably devours them. Surely the theories of Atheism are rational compared with a Pantheism, which offers such adulation to a Cosmos which can neither see, hear, feel, nor think, which is alike incapable of affections and intelligent volition. Truly, one is reminded of the mocking of Elijah, "Cry aloud, for he is a god. Surely he sleepeth, and must be awaked."

45. One of the atheistic friends of our author, whose works he advises the reader not to glance at but to study, pronounces that it would have been better if the universe had never existed; and if no life had ever arisen in the earth any more than in the moon. This assertion is certainly not invalidated by Strauss's thin logic. "If it be true," says he, "it follows that the thought that it would have been better if the universe had never existed, had better not to have existed likewise." One can hardly help thinking that the following passage must have been written in irony.

46. "Sallies of this kind, as we remarked, impress our intelligence as absurd, but our feelings as blasphemous. We consider it arrogant and profane on the part of a single individual to oppose himself with such audacious levity to the Cosmos whence he springs, from which also he derives that spark of reason which he misuses."

47. But I must now draw attention to some of the principles from which the author considers that these are natural conclusions.

48. He begins with the conception of the Cosmos, which he defines "not only as the sum total of all phenomena, but also of all forces and of all laws. The All," says he, "being the All; nothing can exist outside it; it seems even to include the void beyond." After having pointed out the various changes through which its various parts have passed, he goes on to assert that this infinite Cosmos constitutes a unity. "The Cosmos itself," says he, "the sum total of infinite worlds, in all stages of growth and decay, abides eternally unchanged in the constancy of its absolute energy amidst the everlasting revolution and mutation of its parts."

49. I have quoted these passages for the purpose of showing that the fundamental difficulties of this philosophy fully equal those of theism, against which it is in vain for it to urge that it enters into the regions of the unknowable. If the universe is

the sum total of all phenomena, forces, and laws, a few questions may be propounded for its solution. Is it nothing but these? Are phenomena and laws possessed of an objective existence, or must something else underlie them? Are laws existences, or modes of existence, or what are they? Are its forces actually existent things, or qualities inherent in them? Again, "the Cosmos is the sum total of infinite worlds." It is therefore infinite, but consists of finite parts. Can it therefore be a unity? It follows, then, that that which is infinite is not absolutely unthinkable, and that some of the conceptions which are derived from our finite modes of being may be projected into it without violating any principle of sound philosophy. But further, this infinite universe consists of parts several of which are infinite; it follows, therefore, that an infinitude which is composed of subordinate infinities, can constitute a unity. But, as a crowning mystery, we are told that it abides eternally unchanged in the constancy of its absolute energy amidst the everlasting revolution and mutation of its parts. Surely a philosophy which admits a number of such positions among its fundamental principles may be asked to show a little modesty when it assails the difficulties of theism. The one contains unfathomable mysteries equally as the other.

50. But, says our author, "the Cosmos is a phœnix, ever recovering itself from its ashes." Yes, surely, it is a consolatory truth for men who will never renew their personal existence to be assured that their remorseless parent never had a beginning to its activities, and never shall have an end, but that it shall continue throughout the infinities of time and space to cast up the bubbles of phenomena, and devour them, to reappear again in endless progression. Yet this is the god of this philosophy, who goes on endlessly reproducing himself, under the impulse of blind forces directed by equally blind laws, in endless forms of life and death, of reproduction and decay, throughout the dismal eternity of the future. Full well may Strauss's Atheist friend satirize the folly of such a god. But, no: he is alike incapable of wisdom and of folly; though he contains in himself potentiality, and evolves into actuality all wisdom and all folly, all order and disorder, all growth and decay, all good and evil, all virtue and all crime. Verily, such a god cannot be a phœnix, but a Proteus. Yet our author, and those in whose name he speaks, assert that they think it worthy of a reverent regard, and that to insult it is a blasphemy!

51. There is an obvious difficulty which confronts this philosophy, of which it does not attempt to offer a solution. If the Cosmos is thus eternally reproductive, why may it not at some

period during the infinity of future time reproduce our own personal existence, and even hold us responsible for what we have done in our previous state of being? To do so would only be to add one wonder more to the multitude of wonders which it is declared to be able to effect. Against this most serious contingency this philosophy has nothing to offer, but its dogmatic assertion that personal existence, after its fleeting phenomenal appearance, must sink into eternal silence.

52. Let us now examine some of the processes by which it attempts to account for the origin of the existing order of things. With respect to some of the processes by means of which it affirms the universe of matter to have been constructed, we need have no difficulty. They may have been the very means which the Creator has employed to effectuate His purposes; and to accept them as denoting the law according to which creation has been evolved is quite consistent with a belief in Theism. As all His manifestations with which we are acquainted are in conformity with law, and involve the use of means, so there is no difficulty in conceiving that God's creative work has been conducted in conformity with a definite law and order, and that He has made use of means in effecting it, instead of creating each separate existence immediately. On the contrary, it is highly probable that such would be the mode of His action.

53. But this is widely different from the assumption that the Cosmos can have been built up by the action of blind forces without the aid of intelligence and will. Law, however convenient as a term, denotes nothing but an invariable mode of action. In itself it embraces no conception of energy or power, although nothing is more common even in philosophic language than to confound this conception with it. But it is impossible to build the universe without the energetic action of both these. Unless forces have an action given to them, they can effect nothing,—confusion, not harmonious arrangement, will be the results of their operations. These can only be found in intelligence and will. As far as human experience extends, forces acting in conformity with blind laws, have never produced a single adaptation, order, or arrangement, but destruction only. This philosophy, for the purpose of enabling it to dispense with the directing power of intelligence and will, postulates an eternity of time, during which forces have acted, and affirms that this can produce all the results of intelligent volition.

54. Having evolved the matter of the universe into planets, suns, and systems, by means which the Theist need not dispute, as long as they have an omnipotent intelligence at their back,

energizing in and through them, our author is compelled to face the question of the origin of life. He is fully aware of the difficulty of the problem, and admits that it is no solution of it to say, that its absence may be accounted for in the lower strata, by the supposition that causes may have been in existence, which have destroyed all traces of it. "There was a time," says he, "when the temperature of the earth was so high, that living organisms could not exist on it. There was once no organic life on the earth: at a later period there was: it must consequently have had a beginning, and the question is how?"

55. Yes, truly; that is the question. Kant judged that it might well be said, "Give me matter, and I will explain the origin of the world; but not, Give me matter, and I will explain the origin of a caterpillar." Let it not be forgotten also that Kant bowed in reverence before the moral nature of man, and its authoritative affirmation of the obligation of the moral law. These mighty gulfs, however, the philosophy of Atheism and Pantheism has attempted to bridge over. "Here," says Strauss, "faith intervenes with its miracle." This philosophy postulates an operation no less miraculous, viz., the action of blind forces under the direction of blind laws, continued throughout an eternity of time.

56. I need hardly say, that our author resolves all difficulties by boldly assuming the truth of the theory of spontaneous generation. Here let it be observed, that Atheism is obliged to use a word, which implies the presence of will. He admits the uncertainty of previous experiments; but nothing daunted, he affirms, "If the question of spontaneous generation could not be proved in regard to our present terrestrial period, this would establish nothing with respect to a primeval period under totally different conditions. The existence of the crudest form of life has however never been actually demonstrated. Life too, after all, is nothing but a form of motion."

57. On questions of pure physics I shall not enter. But it belongs to the present inquiry to point out the conditions of the problem which this philosophy has to solve; and not to allow it to substitute an unreal for the true issue. That issue is not the one here stated. Before it can advance one step, proof positive of the truth of the theory of spontaneous generation must be given. It is no solution of the problem, to take refuge in the assumed possibility, that it may have taken place under widely different conditions during the uncertain past. To do so is cunningly to assume the question at issue. Professor Huxley tells us that proof of the theory of spontaneous generation has yet to be given.

58. But further: supposing a living being of the lowest type could be constructed in the laboratory, does this bring us one atom nearer to the point at issue? The real question is, whence comes living matter? and what is the distinction between it and non-living matter? There our opponents, being the judges, differ *toto cælo* from each other. Is there any evidence that matter which has never lived, can be made to pass into living forms? Till this can be shown, the mere formation of a being in the laboratory, which possesses the lowest form of life, proves nothing. The only adequate solution of this question on the pantheistic and atheistic side is proof positive that life is a mode of motion, and nothing else. This proof has certainly not yet been adduced, and even if it could be found, there is yet a further question which demands an answer; viz. how, whence, and where has originated this peculiar modification of motion which constitutes life; and how has it come into existence at the favourable moment for its existence? Had it not been favourable, the feeble germ would have been crushed by the mighty powers of nature in the struggle for existence. All this and much more must be answered before it can be proved, that mechanical or chemical forces can become vital ones by any powers which they possess of self-transmutation.

59. Our author endeavours to evade the question by concealing it behind a mass of scientific jargon. He says:—“Life is only a special, viz. the most complicated, form of mechanics. A part of the sum total of matter emerges from time to time out of the usual course of its motions into special thermico-organic combinations; and after having for a time continued therein, it returns again to the general modes of motion.”

60. When we are famishing for scientific bread, it is cruel for philosophy to throw us a stone. As an account of the matter we are considering, part of the above sentence is unintelligible, and the remainder attempts to answer one difficulty by raising others far greater.

61. The perusal of this work affords a striking proof that the philosophers in whose names it is written were far from being satisfied with their position, even after they had obtained possession of an inorganic cell, from whence they might commence the operation of creating the various forms of organic life, of which man is the crown. They felt deeply, in the words of our author, “that no acorn ever produces a fig; that a fish always produces a fish, and never a bird or a reptile; a sheep always produces a sheep, and never a bull or a goat.”

They have therefore hailed, as the rising of a new sun, the theory of natural selection as a means for constructing the worlds of life and organism, without the intervention of a Creator. For the use they make of it it is possible that its author will owe them little thanks; but they are almost ready to forgive Mr. Darwin for his postulate of the original intervention of a God to infuse into inorganic matter the principle of life, in consideration of the greatness of his discovery. He is with them, the founder of the new age, in which the belief in the being of a God is destined to become an old wife's fable.

62. Let it be observed, however, that the Darwinian theory, whatever be its merits or defects, is only a special form of a theory of creation by evolution. It assumes, in the first instance, a creative act, by which some cells had infused into them the principle of life. It then proceeds to account for the existence of every living form by the aid of two principles, designated natural and sexual selection, without any subsequent intervention of Divine power. Whatever may be thought of this particular theory, it is evident that a principle of evolution, by which I mean that all existing organisms have been gradually evolved from one another by the Creator's wisdom and power, through certain forces of which He possesses the absolute control, is as consistent with Theism as any other theory of creation. The only theories which are essentially atheistic and pantheistic are those which lay down that God is not the author of the laws of nature, nor their contriver, nor the director of their operations, and that blind forces can produce the phenomena which result from the operation of intelligence, and that forces can exist independently of His constant energy. The old theory of creation was, that each species was produced by a separate creative act, the idea being that its progenitors must have started into being entire and complete. This may or may not have been the *modus operandi* employed by the Creator; but, as a theory, it leaves us in the dark how creation was effected, except that it was the result of the exertion of the divine will. A theory of development professes to give the law of progress and to account for some of the means through which creation has been accomplished. Whether it has been effected in this way, or in that, can only be determined by the facts of nature which throw light on the subject. To speak of creation out of nothing as an adequate solution of how creation has been effected is only a confession of our ignorance. The real point is, is the theory suggested an adequate account of the facts of nature? Are the means

adequate to produce the result? Or must other agencies have contributed to it, and among them the direct intervention of God?

63. There is, unquestionably, a tendency among religious men to charge every theory of creation by evolution with pantheistic and atheistic tendencies. This would be just, if it were a necessary part of such theories, that blind forces and laws are able to produce this result independently of the power and intelligence of a personal God. But where I ask, is the Pantheism and Atheism, if we assume that the Creator has followed a definite order and law in His creative acts, and has carried them on, as He does all the acts of His providence, by the use of means? Or if, instead of causing the first progenitors of a species to spring up from the ground, He has produced them out of beings previously in existence? Our present knowledge is very inadequate to determine how creation has been effected. This is a strong reason why we should avoid prematurely dogmatizing; but, certainly, none why we should not make it the subject of careful study.

64. There are not wanting indications that in the formation of the universe the Creator has acted through the agency of means, and not by that which we designate direct action. Of this the evidence is considerable. Whether this be an entire account of the matter is quite another question. Still more clear is it that His creative acts have followed a sequence and order, and been constituted on a general plan. This latter point must be admitted even by those who refuse to admit the theory of creation by evolution. We might have hoped that the general acquiescence in the well-known illustration of Paley's watch, would have been a sufficient safeguard against wholesale denunciations of those who hold this theory as if it were destructive of Theism. As he observes, if a watch could be so constructed as to produce another watch by its mechanism, and should thus go on producing a succession of watches, each possessed of the power of self-reparation, we should feel the most profound admiration for the skill of the artist. Nor would it be diminished, if the mechanism could construct a first-rate chronometer; and this a succession of still more perfect instruments. The only point in which such a theory can be either pantheistic or atheistic is when it is assumed that such harmonies can have resulted from the action of blind forces, without the intervention of intelligence,

65. Still more remarkable is it that such a theory should be suspected of pantheistic or atheistic tendencies, when we reflect that the mode in which God has created every individual

is by a process of evolution. Yet, surely, it will not be pretended that He has not made each one of us, and every individual of every species. Yet He has unquestionably effected this by a process of evolution. The media through which He works may be very obscure; but this does not affect the fact itself. History also teaches that in man the evolution of more perfect from less perfect states, is the order of God's providential government of the world. The New Testament declares that revelation has been communicated in a similar manner. Why, then, may not the Creator have created different species by producing one out of another by a process unknown to us. It is absurd to attempt to shut up all inquiries on this subject, by asserting that all such theories are either pantheistic or atheistic.

66. Still, it is undeniable that the Darwinian form of this theory has been widely embraced by the philosophic schools in question, as affording an apparent solution of some of their difficulties. The joy with which they have hailed its advent is very remarkable. It becomes, therefore, a duty thoroughly to examine into its ability to produce the results in question, and to estimate the difficulties with which it is attended. Yet, it must not be forgotten that its author distinctly assumes the necessity of a Creator to infuse into matter the first forms of life, and to impress on it its laws. This difficulty can only be got over by Pantheists and Atheists by the exercise of a hearty faith in some unknown powers of the past or discoveries of the future. It follows, therefore, that the faith which they deride in connection with religion and Christianity is essential to this philosophy. It demands the exercise of faith in the unseen, viz., the discoveries of the future or the unknown possibilities of the past, for without it it is destitute of even the semblance of proof. It would seem as if faith in the unseen is only objectionable when it is demanded in connection with religion.

67. It follows, therefore, that it is impossible for these systems to bridge over the interval which separates life from not-life. There is also another interval which can be spanned by no arch, viz., the production of the power of sensation. According to these theories, there must have been a time when there was no sensation in that part of the universe to which we belong. There, therefore, must have been a time when the first being which was capable of sensation sprang into existence. Pantheism will, perhaps, affirm that the infinite Cosmos has ever possessed within itself sensation and intelligence. If so, particles capable of sensation must have existed in that fire mist out of which the present order of things has been evolved,

the heat of which was sufficient to have sustained all existing matter in the form of gas. If so, their existence must have been very uncomfortable during the countless ages the matter of the solar and sidereal systems has taken in cooling. The alternative will doubtless be preferred, that a time once was, when the first being capable of sensation began to be. But a vast interval separates the sentient from the non-sentient, not a succession of trifling variations. The philosophy which attempts to construct a universe without the intervention of a God is bound to give us an account of how the first sentient being began to be.

68. But there are several other states of being which are separated from each other, not by short steps but by vast intervals. Among these self-consciousness occupies a conspicuous place. It is obvious that it exists. It is as certain as any fact of time or space. We can all and each of us utter the mysterious word "I," and attach a distinct meaning to it. It is the most mysterious of words. Who shall fathom its profound depths? It is that which separates between self and not-self, person and thing. It is that which constitutes us a unity in the midst of plurality and change. As beings capable of self-consciousness, we feel that we have existed through long intervals of time, surrounded by and deeply interested in multitudes of things which are not ourselves. Not one particle of matter constitutes our present bodies which composed them twenty years since, yet we are the same. There must have been a time when self-conscious beings existed not. There must, therefore, have been one when a self-conscious being first began to be. Here then is an interval the depth of which the imagination can but imperfectly fathom. It is not too much to say, that no theory of evolution can bridge this over without the intervention of a self-conscious Creator.

69. There is yet another interval. A being may be a person, and yet have no conception of right or duty. I select this conception as representative of the whole moral nature of man, of which it forms the most remarkable characteristic. It is immaterial to my argument whether the utilitarian philosophy is correct in its analysis of the origin of the idea. I firmly believe that it is not. But the fact cannot be gainsaid, that vast numbers of minds, of the highest order, have a clear conception of duty quite distinct from any reference to utilitarianism. On the contrary, they feel the strongest obligation to sacrifice themselves to it in contradiction to the strongest dictates of expediency. There is something within us which says, let right prevail, even if the heavens fall. There must, therefore, have

been a time when the first being, who was capable of feeling a sense of duty, who could bow before a moral law, and say, "I ought," began to be. The interval is one which separates the conception of duty from non-duty; of conscience from non-conscience; of a moral nature from the want of it. The difference is not one of degree but of kind. Between laws of motion and their modifications, and conceptions of duty, there is no one thing in common. When the idea of duty first originated a new order of being entered the universe.

70. Even if the principle of the utilitarian philosophy is correct, that duty is the obligation to seek the greatest happiness of the greatest number, the argument is unaffected by it. The question still imperatively demands solution, how came it ever to be felt to be a duty, to seek the greatest happiness of the greatest number? When and how has this sentiment arisen? Of what form of motion is it the modification?

71. Such are some of the gaps which must be bridged over by means of clear and indisputable facts, before a philosophy which has no other forces at its command but blind, unintelligent ones, can account for the origin of things. But supposing for argument's sake that these have been surmounted, the question at once arises, whether the pantheistic and atheistic theory of evolution is adequate to account for the existence of the various orders of beings which lie within these bounds. I will now examine some of the special agencies by which it has been attempted to be shown that the various forms of organized life have been developed without the agency of a being possessed of personal intelligence and power. The only principles which this philosophy presses into its service for that purpose are Darwin's two principles of natural and sexual selection.

72. I by no means wish to affirm that these may not have been potent instruments in the hands of Omnipotence by which God has carried on His creative work. That they act within certain limits is an obvious fact. The question is, what are those limits? Are they the only agencies? Are they alone adequate to the work? Must not other principles, known and unknown, have contributed to it? Is their distinct and separate agency conceivable without Omnipotence at their back?

73. We must begin by assuming that life has somehow originated in the earth. The problem before us is as follows: given matter and force acting in conformity with invariable laws, both alike destitute of intelligence, to evolve everything in the sentient universe, which bears the indications of the action of intelligence. Let us even suppose that one or more cells have been evolved from which our course of evolution is to com-

mence which is ultimately to culminate in the production of man.

74. There is one resource to which this philosophy flies in every difficulty, and which it uses with unbounded freedom,—an infinite storehouse of past time. If a thing cannot be effected in one thousand years, it can in a million; if not in a million, it can in one hundred million. If the last period is inadequate, boldly multiply, for it is impossible to break the bank of the eternity of the past. With this agency at its command, all things are possible. Let us hear Strauss:—"Short steps and longest intervals of time are the magic formula by which actual science at present solves the mystery of the universe: they are the talismans by whose aid she quite naturally unlocks the portals, formerly reputed to fly asunder at the sole bidding of miracle."

75. Yes, truly: there is more truth in this passage than its author probably intended to convey. The action of this principle is truly magical and talismanic; it is worthy of the deep consideration of those who invoke it, whether it can effect any results more real than the magical formularies and talismans of the *Arabian Nights*. Little jumps, and infinite time to jump in, is all that is required to evolve all the order and adaptations of the universe, which exist in numbers passing all comprehension. The proposition that, if we have time enough to walk to a galaxy, compared with which the distance of Sirius is a speck, by taking steps of an inch long, we shall get there in the course of infinite time, may be incapable of being disproved; but it is absurd. I submit that this continual invocation of infinite time is not a rational solution of a difficulty, but an evasion of it.

76. The truth is that physical science breaks this magic wand in the hands of the operator. While it tells us that the universe has existed a vast interval of time in its present form, it affirms that it cannot have existed for an indefinite one. The laws of its physical forces assign to it clear and definite limits, which it cannot have exceeded. It follows, therefore, that indefinite demands on a past eternity cannot be tolerated by a sound philosophy.

77. Not only is this philosophy compelled to assume that a number of small variations must have taken place, which for any practical purpose it is impossible to distinguish from infinite; but it is compelled to take for granted that all those have been on the side of progressive improvement. Yet the history of man testifies that nature has made many failures and retrogressions. Human progress has been, unhappily,

full of them. But these are easily got rid of by the theory of the destruction of the weakest and the survival of the strongest in the struggle for existence. Yet history informs us that some of the weak races of mankind have a remarkable tenacity of life.

78. But if such a tendency exists in nature, this philosophy is bound to give us some account of its origin. Tendencies in nature on the side of progress are very useful ones. It is, therefore, a serious question, How got they there? For ought that appears, blind matter, force, and law might have produced tendencies suited to shiver systems to pieces, and not to construct them. Does not the existence of such tendencies imply the presence of superintending mind?

79. But, says this philosophy, all that is necessary is to continue advancing by slow and gradual variations; and this glorious universe, with all its complicated adaptations, crowned by man, will appear at last! We need not care for the shortness nor the variety of the steps, nor for occasional movements in a backward direction; for have we not infinite time at our command? The cell, with its lowest forms of life, or the intellectual or moral atoms diffused in yonder fire-mist, will in due time produce all the complicated organisms of living beings, with their wondrous adaptations, and at length a Newton, a Shakespeare, and a self-denying Howard.

80. But, I ask emphatically, are such short steps all that is required? Shall we not be brought to a standstill by the absence of necessary conditions? Blind forces cannot effect their work except by the aid of things which, for want of a better name, we must call favourable chances, by which I mean forces intersecting one another at the right time and place. What myriads of forces must have worked in vain for the want of this condition of successful operation? Let me illustrate this by the example which Strauss has chosen as an illustration of the manner in which we may readily account for the production of the various organisms of nature. "Let us suppose," says he, "a herd of cattle in primitive times to be still destitute of horns, only possessed of powerful necks and projecting foreheads. The herd is attacked by beasts of prey: it defends itself by running against them and butting with the head. The butting will be the more vigorous, the bulls the fitter to resist the beasts of prey, the harder the forehead with which he butts. Should this butting in an individual have developed into an incipient horny accretion, then such an individual would have the best chance of preserving his existence. If the less equipped bulls of such a herd were torn to pieces, then the

individual thus equipped would propagate the species. Unquestionably there would be some at least among its descendants in whose case the paternal equipment would be repeated; and if on renewed attacks these very ones again survived, and, moreover, principally those whose horns were most developed, then little by little, by transmission of this weapon to the other sex, a completely horned species would be formed, especially if the other sex would of its accord give the preference to the males thus ornamented; and here Darwin's theory of natural selection is supplemented by the so-called sexual selection, to which he has recently devoted a special work."

81. Few of the operations of nature would seem to be more simple than the manufacture of a horn; let us, therefore, carefully examine the amount of time and lucky chance which this theory finds it necessary to postulate as necessary for its formation. This will give us a clear idea of the difficulties which must have been surmounted in the course of the evolution of man from an inorganic cell, if there was nothing but unintelligent forces to operate with.

I. The theory before us presupposes a very favourable concurrence of circumstances with which to commence our operations. Nature has already kindly furnished us with a herd of cattle, with powerful necks and protruding foreheads. How long it must have taken to form these latter appendages this philosophy does not tell us. Having eternity at its command, it simply brandishes its magic wand and says, as indefinite a number of eons of past time as you require.

II. Another favourable condition is provided all ready for our use. It seems that a horn cannot be grown on a hornless animal without the exercise of butting; accordingly, a number of beasts of prey are at hand at the proper time and place to offer battle to our unhorned herd—these, be it observed, are supposed to be fully equipped with all their weapons of offence. But suppose that these latter had come into existence at a different time and place, or that instead of our oxen being surrounded by beasts of prey, they had come into existence among a number of peaceful creatures, the whole operation of horn-growing must have come to a standstill. The concurrence of such favourable contingencies could only have occurred after the lapse of indefinite eons.

III. The herd, when attacked, defend themselves by butting. It was fortunate that nature should have furnished them with this impulse. This looks like the presence of intelligence, for unintelligent nature might quite as well have provided them with a disposition to run away when attacked, as she has the

hare, and there would have been no tendency to generate a horn. Such a disposition must have required the concurrence of multitudes of favourable circumstances for its formation, as well as that of indefinite eons of time.

IV. The act of butting has a tendency to harden the skull; this we know to be a fact. Still, a philosophy whose object is not theory, but truth, cannot help inquiring, Whence came this tendency? It might have been one in an opposite direction.

V. We are next invited to assume that repeated acts of butting have not only hardened the skull, but developed a horny accretion. The remarks of our author might lead the reader to believe that all this could have been effected in a single generation of bull life. But it is quite evident that it could only have been the result of the struggles of protracted generations, who succeeded in transmitting to their descendants a gradually increasing horny appendage. If it were not so, bull life in those primeval ages must have been protracted to a period compared with which the age of Methuselah must have been as nothing. Let it be observed also, that the concurrence of every one of these favourable conditions must have been continually repeating themselves.

VI. The bulls, says our author, who have succeeded in developing these horny appendages will have the best chance of preserving their existence. Still this is a chance only, but not a certainty, for many other contingencies might have destroyed them. Deaths from disease were probably not unknown in primeval times, and against this the possession of an incipient horn would have been no prevention.

VII. We are next asked to assume that these bulls go on continually fighting until all the less-equipped ones are torn in pieces, in order that an individual with incipient horns may become the progenitor of a race. This philosophy, however, is utterly silent as to the number of years and of favourable contingencies it would have taken to bring about this result. It simply brandishes its magic wand, and the unhorned oxen disappear.

VIII. It is necessary that the bull with incipient horns should procreate descendants similarly equipped. It is undoubtedly in accordance with natural facts that he should do so. Still this philosophy is bound to tell us how came this law into existence, for it has the appearance of being a result of that intelligence, the existence of which it denies.

IX. Our incipient horn has yet to grow into a longer one, and then into a longer one, until it attains its full length. For this purpose, these processes of fightings and buttings, and

throwing out of small variations and survivals of the strongest, besides ever-recurring favourable contingencies, have to be repeated times without number. To evade these difficulties, our only resource is again and again to brandish our magic talisman of infinite time.

X. As yet this long and painful process has only led to the evolution of horned individuals, and not a horned race. We must therefore invoke the theory of sexual selection, and suppose that the horned females fall in love with the horned appendage of their male companions. It is not easy for us to say what are the precise ideas which cows entertain of beauty. We know, however, that it is far from an invariable fact that the most handsome men and women unite in matrimony. Still, however, the assumption must be made, that the horned bull is irresistibly attractive to the horned cow before a horned species can be finally established by the forces at the service of this philosophy.

82. It is hardly possible to go through these successions of indefinite eons of time, and of concurrences of lucky chances with gravity, and suppose that they constitute a true account of the past history of the race of long-horned oxen. But the consequence which I deduce from it is a perfectly grave one. Few operations of nature can have been more simple than the evolution of a horn. But if by the aid of these forces alone the operation must have been so complicated, involving indefinite eons of time, and the casual concurrence of multitudes of happy chances, for its accomplishment, what must we say of the period requisite for the production of the other peculiarities of the race of oxen? What must we say of the infinitude of them, which must have been necessary for the production of all the complicated organisms and adaptations of animal life? This philosophy affirms that the bodily, intellectual, and moral nature of the most highly gifted man has been slowly evolved by a few unintelligent forces in a long line of ancestry from a simple cell. Will it endeavour to compute the number of distinct species which must have evolved in this long succession; the number of eons which must have elapsed before each stage could have been accomplished? or the number of happy chances which must have concurred before each step could have become a possibility? When it has done this, let it multiply these arrays of figures, which it is scarcely possible to embody in any finite conception, and present us with the result? Surely this philosophy has stumbled on the regions of miracle without observing it. Far more miraculous is this mode of evolving the universe than the intervention of an intelligent Creator.

83. The number of intersections of independent forces, directed by nothing but blind laws, which this system is compelled to postulate, is alone sufficient to destroy its claim to be received as a philosophy. We know, as a matter of fact, that the occurrence of one lucky chance is a reason for expecting that it will not occur again; but this system is compelled to postulate them in endless succession. What right has it to make unlimited drafts on the infinite past, or the infinite future? What can positive science have to say to either of them? To affirm that blind forces can effect all things, if they have only sufficient time in which to operate, is not to propound a philosophy, but its negation. Our author, however, is not insensible to the difficulties with which he has to struggle. "It was doubtless," he says, "no small achievement, when, in yon ape-like horde, which we must consider as the cradle of the human race, the thoroughly erect posture became the fashion, instead of the waddle or partially developed gait of the higher apes; but step by step it went on improving, and time at least was no consideration. . . . More astonishing still does this progress appear, from the harsh scream of the ape to articulate human speech."

84. Yes, doubtless, vast is the gulf which separates the two, for it involves the entire interval which separates the rational from the irrational, the self-conscious from the non-self-conscious, the capacity of moral obligation from the absence of it. Strauss is well aware that without language as an instrument, all real thought is impossible. He therefore summons to his aid a race or races of intermediate beings, of whose existence the evidence is *nil*, and supposes that they have existed. He also observes that monkeys have a kind of language, although he candidly admits that, whatever else they are capable of being taught (and they can be taught many things), they have never learned to speak, even when they have been brought into the closest contact with man. Nor has our constant companion, the dog, with his half-rationality and his apparent desire to give utterance to his feelings, made the smallest approach to the use of articulate speech, although he has been the friend of man for thousands of years. If a pantheistic or an atheistic philosopher could educate either the dog or monkey to use rationally even the lowest elements of human language, he would do more to prove his theory than by millions of conjectures.

85. But, adds our author, "Ere that prehuman branch little by little elaborated something of a language, periods of immeasurable duration may have elapsed; but after he had once hit upon speech, in however imperfect a condition, the speed of his progress was vastly accelerated," &c.

86. I ask emphatically, is it reasoning, to have recourse to the magic talisman of infinite time, as the solution of every difficulty? Is it not more rational to invoke the aid of an intelligent Creator? If it be replied that an intelligent Creator belongs to the regions of the unknowable, does not an inexhaustible past eternity equally belong to them? Does it not leave the origin of intelligence utterly unsolved?

87. Our author justly remarks, that if the power of thought fills us with astonishment, that of feeling is no less marvellous. "A divine force," says he, "reveals itself in the sensations of the lowest animal as much as in the brain of a Newton." After giving utterance to this great truth, a number of reasonings follow, for the purpose of proving that neither the one nor the other is divine. "If," says he, "under certain conditions, motion can be transformed into heat, why may it not, under other conditions, be transformed into thought, into sensation, or even into self-conscious reason and will?" Why, indeed? Because the one class of phenomena are entirely different from the other. Any philosophy worthy of the name ought to give proof of its assumed facts, instead of taking them for granted, by asking others to prove their impossibility.

88. This school of philosophy is forced to admit that there are certain organisms which are formidable obstacles in the way of elaborating the universe without the aid of an intelligent Creator. Of these, the eye may be taken as a crucial instance. "It is formed," says Strauss, "not in the light, but in the darkness of the womb, yet it is admirably adapted to light which has had no concern in its formation." A similar difficulty is well put by another writer, quoted by our author, respecting the instincts of animals. "These latter enable them to perform from their birth, with hereditary finished art, to which the highest reason might have prompted them for their well-being, without any thought, experience, or practice on their part, or any instruction, example, or pattern." Pantheism endeavours to account for this by assuming the presence of unconscious intellect in the universe.

89. Let it be observed that our sole experience of intellect is as an attribute of conscious beings. If philosophy is to rest on a basis of fact, the existence of unconscious intellect diffused in the universe is a gratuitous assumption. No doubt many intellectual processes take place in our minds without leaving any trace on the memory; perhaps without emerging into direct consciousness. This is especially the case with such actions as have become habitual. But this affords no proof of the presence of intellect in a wholly different class of beings. If unconscious

intellect can exist independently of any thinking subject, and aid in the construction of organisms, it follows that it must be inherent in every particle of matter of which they are composed. Also, that these unconscious intellectual atoms must have the faculty of acting in unison for the production of a common end; and from the various means by which it may be accomplished, of selecting the most suitable. The bare statement of such a proposition is its most effectual refutation.

90. Next, our author invokes a theory of an unconscious absolute, which, "acting in all atoms, and organisms, as a universal soul, determines the contents of creation, and the evolution of the universe, by a 'Clairvoyant Wisdom,' superior to all consciousness." Such a theory may safely be consigned to the regions of dreary mysticism, though it is one which was hardly to be expected from one who imagines that he has escaped from the regions of the miraculous, by eliminating the conception of God from his philosophy.

91. But to enable him to account for the production of beings endowed with these faculties our author supplements these two principles by a theory of inherited habits, transmitted through a long line of ancestors, which have been gradually accumulated through indefinite successions of eons. "It is not," says he, "the seeing individual which forms its own, or its offspring's, eyes by acting in concert with light . . . . the individual finds itself put into possession of an instrument which its predecessors, during immemorial time, have gradually brought to an ever higher grade of perfection." Again, "It is not our present bee which plans its skilful constructions, neither is it instructed in them by a Deity; but in the lapse of thousands of years, since the lowest instincts were gradually developed into the various forms of Hymenoptera, the increasing needs produced by the struggle for existence have gradually fashioned these acts, which are now transmitted without effort as heirlooms to the present generation."

92. In the case of the eye there are two problems which require a definite solution, and we must not have our mental vision distracted from the point at issue by any phantasmagoria of words. First, the admirable adjustments and adaptations of the instrument itself—How come they? Secondly, How has this instrument, formed in total darkness, become perfectly correlated to the properties of light? There is one solution of these problems quite simple, and fully adequate to account for the facts—the existence of a God of boundless power and matchless skill, and fully acquainted with all resources and the end to be attained, who has framed the mechanism and adjusted it to external nature.

93. But there is also the solution of Pantheism and Atheism. Some of the simplest forms of life in the shape of cells burst into existence we know not how. These in the course of indefinite eons developed themselves into organisms of the simplest character, and these into others of endless variety impelled by blind forces alone; these grew into more perfect forms in the struggle for existence. Though why, until life had become abundant, there should have been any struggle at all it is hard to conceive. A power of sensation originated somehow, but how or whence we have no means of telling. These beings gradually differentiated themselves;—but how, whence, or where this power originated, or how each became possessed of another power, that of propagating its like—this philosophy is silent. After long courses of indefinite eons, a general power of sensation, diffused throughout the entire animal, concentrated itself in special senses, and produced the lowest form of eyes. Eon after eon rolled on its relentless course; variation arose after variation. Struggles for existence were ever ready to destroy imperfect specimens; at length one of the most perfect forms of eyes emerges. But all this leaves the problems with which we started utterly unaccounted for, viz., whence has originated the adaptations of the instrument itself; and how, being formed in darkness, has it become perfectly adapted to external light.

94. With respect to the origin of instincts, our philosophers take refuge in a theory of transmitted habits during something like an eternity of time. Step by step they have grown from the smallest origin, and by gradual accretions have been handed down from remote ancestors until they have assumed their present form. But if this were conceivable, the question arises, How came habits to be thus transmissible? Is it the result of the action of blind forces or of intelligence? Again, why is it that the inherited habits of instinctive intelligence, which must have been possessed by multitudes of ancestors in the long line of man's pedigree, have not been transmitted to him; but in this respect he is utterly distanced by the inferior animals? Let it be observed, that it is not a single instinct which has to be accounted for, but numbers numberless, spread over the wide regions of animated nature, and each adapted to the external circumstances of the animal.

95. The philosophy which we are considering is never wearied with urging the objection that our conception of a personal God is nothing more nor less than a magnified man. A very popular writer has recently had the bad taste to assert that the belief in a personal God differs little from a magnified Lord Shaftesbury. Such a question is one far too grave to be settled by ridicule.

96. It is perfectly true, that as long as man is man he can only represent truth in human conceptions. No less so is it that multitudes of his conceptions are inadequate representations of the realities beyond. If our reasonings were to be confined to conceptions which are adequate representations of things, they would be few indeed. The truth is, there is a law of our intellectual being which compels us to transcend the limits of the finite, and to assert that there must exist something beyond our highest conceptions of it. It is the very condition of thought.

97. But this philosophy affirms that the conception of a being who is at the same time personal and infinite involves a direct contradiction, and that a philosophy which asserts the existence of a personal God must be rotten at its foundations.

98. It is perfectly true that we have no experience of personality except as an attribute of finite beings. Let us inquire what we mean when we affirm that we are persons. A being who is a person is one who can predicate "I" of himself, who is conscious that he is distinct from all other persons, and non-persons, whose identity is preserved throughout all changes, and through protracted intervals of time, who feels himself to be a free agent, and is the subject of moral affections. There is no reason why an infinite being should not be capable of all these. The objection would be equally valid against introducing infinite quantities into calculations, because all our conceptions are finite. These, however, exist for the practical operations of mathematicians.

99. There is no doubt that the habit of theologians of reasoning about the infinite in the abstract, and not in the concrete, has involved the whole controversy in serious difficulties. What do we really mean when we assert that God is infinite? I answer that He is a being who transcends our highest thoughts, and that He is something beyond which we cannot fathom; that there is no point of space where His energy is not present; that there is nothing which is possible, which He cannot effect; nor any knowledge which He does not possess. His moral attributes ought to be designated perfect rather than infinite. The conception of infinite is quantitative, a moral one has nothing to do with quantity. Perfection, not infinitude, is properly applied to our ideas of justice, holiness, truthfulness, benevolence. The conception of a personal being, who in this sense is both infinite and perfect, plainly involves no contradiction; and is evidently not unthinkable, though our conception of Him may be inadequate.

100. Now, while it is a law of our nature that all our ideas must be human ones, there is no possible reason why they may

not represent attributes of other beings as well as of ourselves. If I see an animal perform actions of a certain character, I am justified in drawing the conclusion that they are the results of intelligence, although I am only acquainted by actual experience with human intelligence. I infer justly that the animal mind possesses in these respects an intelligence similar to my own. If, then, I can conceive of an imperfect form of intelligence, and reason on the fact, why may I not attribute our highest powers, freed from the imperfections with which they exist in man, to God? To assert that such an act is merely to manufacture a gigantic Lord Shaftesbury is not to appeal to reason, but to the worst feelings of our nature.

101. Nothing more clearly shows the impotency of this philosophy to grapple with the difficulties in which it is involved than the necessity it is under to use language which contradicts the truth of its own assumptions. Our author endeavours to apologise for the practice: "In so far as we speak," says he, "of a purpose in the universe, we are clearly conscious that we are expressing ourselves subjectively, and that we only express by it what we seem to recognize as the general result of the co-operation of the entire powers of the world."

102. In one word, all such expressions are bluffs to enable us to impose on ourselves. A purpose in the universe is no purpose. It exists only in a delusive fancy of our subjective selves. Numbers of similar conceptions made use of by this philosophy can only exist as attributes of personality, and are utterly inapplicable to an impersonal something, whether we designate it Universe or God.

103. Yet our author writes as follows:—"The general deduction from the existence of the universe appears to be, as a whole, the most varied motion or the greatest abundance of life; this motion or life specialized as one developing itself morally as well as physically, struggling outwards and upwards, and even in the decline of the individual only preparing a new uprising."

104. Such language is a plain stultification of the principles on which this philosophy is based. Still more remarkable is the following passage:—"From our standpoint the object of the terrene development seems much nearer its attainment now, when the earth is filled by men and their works . . . than many thousands of years ago, and when she was still exclusively occupied by mollusca and cretacea, to which fish were added later, then the mighty saurians with their allied species, and, finally, the primeval mammals, yet without man."

105. What object? I ask; for an impersonal Cosmos can have none. Is man, then, the end of creation, its complement and crown? Is the purpose of an impersonal Cosmos getting near its realization? Unless this philosophy utters absolute nonsense, it has arrived at the same conclusion as Theism, that a purpose exists somewhere in the universe. Common sense must draw the conclusion that a purpose can exist only in a personal intelligence, *i.e.* in God.

106. But there is a future which this philosophy must face, and which the mind of man, despite of all philosophy, will inquire into with the profoundest interest. What, then, are the destinies of the Cosmos? What are the future prospects of man as an individual and a race? Let us hear the answer which it returns. "Nevertheless a time must come when the earth will be no longer inhabited; nay, when we shall have ceased to exist as a planet. Then all which in the course of her development was produced, and in a manner accomplished by her—all living and rational beings and all their productions, all political organizations, all works of art and science—will not only necessarily have vanished from existence without a trace, but even the memory of them will survive in no mind, as the history of the earth must necessarily perish with her."

107. Surely this is a dark prospect which this philosophy unfolds. Man, as an individual, and as a race, shall pass into eternal silence; and no trace of him or his works shall remain in any mind. Still, if this is the inevitable destiny of the future, let us face it boldly and honestly; and not imitate the ancient philosopher, who wished, if the doctrine of man's immortality were not true, that no one should deceive him while he lived. No; if this philosophy is true, the most cultivated intellects, the greatest moral elevation, and the lowest baseness of wickedness, shall alike rest in peaceful, but eternal silence.

108. Again, "Either the earth," says the author, "has missed her aim here—no result has been produced by her protracted existence—or this aim did not consist in something which was intended to endure, but has been attained at every moment of her development." Let us take courage then, for the gospel of despair can only express itself in the terms of the gospel of hope. Nature, then, has an aim and a purpose! Aims and purposes are not attributes of an impersonal infinity, but of intelligence, personality, and will. It also announces that the infinite All perishes not, nor ceases from its perfection. "The All in no succeeding moment is more perfect than in the preceding one, nor *vice versâ*. There exists in it, in fact, no

such distinction as sooner or later, because all gradations and successions, stages of contraction and expansion, ascent and decline, becoming and perishing, exist side by side, mutually supplementing one another to infinity." This, then, is our consolation. Though we perish, the mighty All remains unchanged in its perfection. The elements of which we are composed may, during the evolutions of eternity, help to build up glorious galaxies, though of ourselves, as conscious individuals, there shall be no resurrection.

109. There is something in human nature too strong for the reasonings of pantheistic and atheistic philosophy to crush. Danton, when questioned at his last trial as to his abode, replied, "My abode shall soon be annihilation; but I shall live in the pantheon of history." This philosophy teaches that even this hope is only a fond delusion. What are the substitutes it furnishes to satisfy the eager cravings of the human heart? Ah! a reverent regard for a Cosmos for which it is impossible to feel either reverence or regard. The memory of a departed wife, to be to us in place of a religion; the worship of humanity, typified in a female form, the destruction of which humanity is certain. This is its substitute for a personal God, the moral governor of the universe, which He has created; whose attributes are justice, mercy, and truth; whose providence embraces all His works; who shall continue reigning for ever and ever. Religion teaches an hereafter, which shall give a scope for the exercise of man's mighty powers, which is denied him here. But this philosophy affirms that one destiny awaits the holiest and the most abandoned, the man of the most disinterested benevolence and the most refined cruelty, a Nero and a St. Paul—a silence from which there shall be no awakening—the conscious being of both alike shall be swallowed up in the infinite Cosmos. The only conclusion of such a philosophy must be, let each man enjoy life as he best can, for we shall die to-morrow, and sleep for ever the sleep of unconsciousness. The best safeguard against such a philosophy is, that human nature will refuse to accept it as a true account of its aims, its aspirations, and its destinies.

The CHAIRMAN.—I am sure that I shall fulfil your desires by expressing our thanks to Mr. Row for his very ably reasoned out paper. Some letters will now be read by the Honorary Secretary.

The HON. SECRETARY.—The first letter which I have to read is from the Ven. Archdeacon W. LEE, D.D., Professor of Divinity at Trinity College, Dublin.

"My dear Sir,

"April 12th, 1874.

"Mr. Row's paper is excellent, and is remarkably successful in embracing within a very limited space a very large field indeed of controversial matter. It is calculated to be most useful, and I desire to bear my humble tribute of assent to the soundness of the conclusions maintained, and of the principles upon which they are grounded.

"I thank you much for allowing me to study this valuable paper, and I congratulate your Society on having the privilege of giving to the world so powerful an antidote to the unbelieving tendencies of Positivism and Pantheism.

"I remain, faithfully yours,

"Capt. F. W. H. Petrie."

"WILLIAM LEE.

Rev. Canon MOZLEY, D.D., Regius Professor of Divinity at Oxford, writes as follows:—

"April 18th, 1874.

"I have read with the greatest interest the Victoria Institute paper, which is full of important thought upon the question of the day. The discussion of the Darwin question seems to be especially able, and charged with strong argument upon the turning-points. The resort of a blind infinity, to which everything is referred, and which is thought to carry off any amount of contrivance under the shape of chances (of which it includes an infinite number), is admirably exposed. The paper shows, with great power, that contrivance cannot be identical with an infinite chaos of jostling chances, one going against another; and that an infinity of time does *not* give you a reasonable foundation of apparent works of design,—if there is nothing to be taken into account but that, to reduce a confusion and medley of blind laws to order.

"The terrible melancholy of Strauss's system must, one would think, limit its adoption to the most determined of the despairing school. He seems to grasp with considerable power in his mind, the frightful end of annihilation, as he maintains it, and to make that power which he exerts a consolation to him for the dreadful truth, as he regards it; but it is a barren consolation indeed.

"I am, yours very truly,

"J. B. MOZLEY."

The Rev. Prebendary COLERIDGE writes:—

"April 11th, 1874.

"I have read Mr. Row's able paper with much interest, and very general approval. I shall not be able to be present at the discussion, and even if I had more time at my disposal, I feel that any remarks of mine would scarce be worth the attention of the meeting.

"As regards the great question at issue, my main reliance under God is:—

"First, on the *zeal*, the *discretion*, and the religious *wisdom* of the Christian ministry; on their good example and personal influence. Christianity, truly and rationally exhibited, shines by its own light; while as regards pure theism, the Gospel of Christ, in its fullness and purity, I believe to be at once the best exponent, and the only safe guardian, of the great fundamental truth which it pre-supposes and embodies.

"Secondly, in the spread of a spiritual philosophy, not set forth in overt opposition to the materialistic tendencies of the age,—rather embracing and welcoming the discoveries of modern science, though placing them in a truer and fuller light,—a philosophy underlying what now assumes, too exclusively, the name of science—*scientia scientiarum*.

"Still, there may be need of direct controversy in the way, whether of

attack or defence ; and here there needs, what is too often wanting, a thorough understanding of the adversary's stand-point, his arguments, and conclusions, with a manifest disposition to do justice both to him and to his views : not to aim at a mere argumentative triumph ; not to take advantage of any accidental slip or error in his ratiocination ; rather to place the position combated in the best light of which it is susceptible : not to trust too much to the argument *ex concessio* or *ad hominem*. The cause may be right, though the pleading be weak ; and, in fact, the good cause has suffered far more from its friends than from its assailants. In a word, to seek *truth*, and we are told to seek peace, as to ensue it, impartially, if not dispassionately.

"And, when all is done, any belief in God worth contending for, must, in my judgment, rest upon a ground of *faith*. There must be a suitable attitude and energy of the *will*,—a *moral* element, which cannot and ought not to be eliminated.

"It may be added, that the most telling arguments against the truth of religion, whether natural or revealed,—that is to say, Scriptural,—lie out of the domain of physics. They are either metaphysical, or, much more commonly, of a moral nature, and appeal to the conscience. It is with these that we have mainly to deal.

"Mr. Row's assault upon the Darwinian hypothesis is very powerful ; and it is remarkable that one strong objection,—want of time,—has been anticipated, but not answered, by Darwin himself. But the question is not vital, however Strauss may have regarded it. Whatever the *process* may be, the result is not less admirable, nor the original less divine. Such inquiries into the course of nature may be examined with entire equanimity. The mystery of creation is not hereby solved, nor the divine truth any way compromised.

"As regards *causation*, my impression is that John S. Mill was latterly opposed to Comte on this point, and that he recognized a true causality. Anyhow, I entirely agree with the lecturer.

"I am, &c.,

"DERWENT COLERIDGE, M.A., Prebendary of St. Paul's."

The Rev. Prebendary GRIFFITHS says :—

"April 10th, 1874.

"SIR,—I regret that I am unable to be present at the reading of Mr. Row's paper, but avail myself of your invitation to give utterance to some thoughts of which it is suggestive.

"I.—And first. The quotations from Strauss appear to me striking instances of what I conceive to be the fundamental fallacy which pervades the whole school of thought of which he constitutes himself the mouthpiece ; namely, the deluded and delusive worship of mere empty words. With them, as Caro says, 'les mots prennent la place des êtres ; l'axiome *Nomina Numina* est à la lettre une vérité pour ces nouvelles écoles.' Thus we find them substituting adjectives for substantives ; relations of things for things related ; appearances for things apparent.

"1. Take their first principle (paper, sec. 9), that 'all our knowledge is merely phenomenal.' This very fact, instead of justifying our stopping short at the phenomenal, suggests, and by the laws of our mind obliges, the recognition of *things*—realities—underlying this phenomenal. For 'phenomenal' is an adjective, and 'phenomena' equally an adjectival term, has no meaning till you supply the suppressed substantives. And these substantives force themselves on our notice from two different sides ; you must complete the phrase by the admission of an *object* or objects of which

phenomena are phenomenal, and of a *subject* or subjects to which they are phenomenal. The images in a mirror are phenomenal; but they, by the very force of the word, imply objects of which they are the reflection, and a subject to whom they reflect their objects. To speak of 'phenomena' taken alone is as absurd as it would be to speak of 'greennesses' instead of things green. And universally, a 'phenomenal' world does not exclude, but by the very adjectival nature of the term implies and demands, the recognition of non-phenomenal realities which present these phenomena to a reality which perceives them. 'No appearance without reality,' is a principle which Herbart has thoroughly established in his *Hauptpunkte der Metaph.* and throughout his works.

"2. A similar sophism runs through Strauss's words in (paper, sec. 43). 'We must regard the creation as the laboratory of the reasonable and the good.' The phrase is perfectly empty, unless you fill it up with its proper contents, 'reasonable and good things.' And reasonable and good things can have their origin only in a reasonable and good person of whom they are the emanation, and who has (to use Strauss's own words) 'a disposition to the reasonable and the good.'

"3. Again, when it is affirmed (paper, sec. 56) that life is 'nothing but a form of motion,' the question immediately presents itself, 'but what is motion?' Motion is not a *thing per se*, but simply a term expressing a relation of things—a state of relation between things. It implies therefore and demands the recognition of things (entities) existing in certain relations to each other, the changes in which relations are manifested to us in the form of motion. There must be life, or lives, existent, in order to present to our eyes this 'form' or these varying 'forms' of existence which we designate as 'motion.'

"In short, on this whole subject M. Caro's answer to M. Taine is irresistible: 'Qu'on essaye de concevoir ce que serait un fait s'il n'y avait pas d'êtres, un phénomène s'il n'y avait pas d'existences. 'Nous ne saisissons,' dit M. Taine, 'que des couleurs, des sons, des résistances, des mouvements.' Mais la couleur, le son, la résistance, le mouvement, voilà certes les plus intelligibles des abstractions si vous n'entendez pas quelque chose qui est coloré, sonore, mù et résistant, ou bien encore si vous ne concevez pas ce rapport particulier entre telle chose extérieure et le moi qui constitue la sensation de couleur, de son, de mouvement, et de résistance.' (Caro, *L'Idée de Dieu*, p. 165.)

"II.—In regard to the theory of Evolution, I hold that it has as much consistency with Theism as any notions of 'creation' hitherto held. For 'Evolution' seems to me only a wider generalization, from wider premisses, of the notion of production. And it matters not through how many or how few stages this production runs. Our views of the mode of production must vary with our insight into the processes of nature; but the fact of production remains the same. All processes, mediate or immediate, are still the processes of an ever-present and originative Deity. God always *is*. 'My father works without intermission up to this present moment, and I similarly so work.' The *vis genetrix* (the Father) and the *vis formativa* (the Son) are constants (John v. 17).

"III.—Once more I would suggest, in connection with sections 98, 99, that it seems to me a hasty assumption of our opponents, too generally conceded, that 'Personality' involves of necessity the antithesis between self and not-self; the predication of 'I' in conscious distinction from 'not I' (sec. 98). Animals have clearly this distinction; they are individuals, and feel themselves to be individuals as much as we do; yet animals have not what we mean by Personality. The essence of Personality I am disposed to place (with I. H. Fichte, who has elaborated the point) in the power of self-

inspection and self-regulation ; the ability to take in by the mental glance the whole compass of our conceptions, in their proper order and associations, and to govern ourselves at all times, in all things, in accordance with this comprehensive view. In this sense, individuals attain Personality only in proportion to such self-knowledge and self-government, and the divine Being, so far from being incapable of such Personality, is the only Entity in whom it perfectly exists.

"I therefore fully agree with Mr. Row (sec. 99) in deprecating the use of the abstractions—'infinite,' 'absolute,' &c., as applied to this divine Being. It is only by analogy that we can speak or think of Him at all ; and this analogy we can borrow from no other quarter but our own nature, seeing that this nature is incontestably the highest known to us. In cases where men were more degenerate, they often represented their Deities under terms borrowed from animal superiority ; but in proportion as we are human, we can fitly conceive God only in terms of the human : as the Image of God in us makes itself clear we can (reciprocally) *think* God only after the image of man. We must conceive Him as the perfect Model of those highest qualities which glimmer in us imperfectly ; and this, too, in the *order* in which these qualities unfold themselves. Whence, in successive stages of human development the Deity is figured, mainly, at one time as the All-Powerful ; at another as the All-Wise ; at another (as the culminating point of the idea) as the All-Good.

"I am, &c.

"THOMAS GRIFFITH, Prebendary of St. Paul's."

The CHAIRMAN.—It is an exceedingly happy circumstance that Mr. Row has brought before us so clearly the tendency of the philosophy of Mill, and also that of Strauss. Perhaps Mr. Row has been less successful in grappling with Dr. Darwin's views, and in stating the views of the objectors to his theory ; for I do not suppose any one who is acquainted with Dr. Darwin would accuse him of *intentional* atheism or of pantheism. What the result of his theory may be is another matter, concerning which I have a strong judgment of my own. But I conceive from all I have noticed in studying Dr. Darwin, that he has formed his theory independently of the question as to whether there was any Supreme God or not,—not taking the trouble, if I may so speak, to decide logically that question. He always speaks with a kind of reverence of the Almighty ; and in his theory the Almighty holds a place which has been objected to by some as being extremely illogical ; for he brings in the notion of the Almighty, but it is such an Almighty that when we come to consider the idea we find it is not the Omnipotent Being of either Christianity, Judaism, or Mahometanism. It is a being who, having given rise to, and originated certain creations, seems to have lapsed into silence, very much like the Indian Brahm, who finished up by producing an egg which shone like ten thousand worlds ; out of which egg was produced Brahma, the active intelligence : and that active intelligence had to have his works perfected by the Indian Vulcan, who wrought everything into perfect order. The notion that Darwin brings before us, of natural selection, certainly involves a personality always and continually at work. That personality many persons suppose to be a divine power ; but then it is a strange conception of a divine power that that power should be

attendant upon a series of changes and chances ; and that when a good change is made which produces an improvement, divine power should be always ready to pick up the change which opportunity thus offers, and to perpetuate it for the future. All this theory seems to me so very illogical that I cannot conceive how it is that persons of intelligence can be satisfied with it. But it is not atheism, nor is it pantheism, although to my mind it is something more like polytheism than either.

Mr. CADMAN JONES.—There is only one point to which I should like to call attention, and that is a mathematical one with which I happen to be familiar. There has been brought forward here what all mathematicians would pronounce to be a mathematical heresy. It occurs twice,—first in the 37th paragraph, where it is stated that, “as far as experience goes, lucky chances have no tendency to repeat themselves. On the contrary, the legitimate inference is that the occurrence of one once, is a reason why we should expect it not to occur again.” Then it is repeated in the 83rd paragraph, “We know, as a matter of fact, that the occurrence of one lucky chance is a reason for expecting it not to occur again.” Now, according to the theory of chances, let us take the instance of twelve dice, and suppose that they were perfectly fair, so that on an average each die would bring up its ace once in six throws. If they fell all aces at the first throw there would be no reason, from its happening that time, why it should not be just as likely to happen again upon the next throw. It is a most improbable event that they should turn up all aces, but, assuming the dice fair, whatever the probability was at the first throw there is just the same probability at the second. The only way in which the fact that they all came up aces the first time bears upon the probability that they will all come up aces on the second throw, is that it raises an inference that they were loaded. On this ground if a certain contingency happens once, it is rather more likely than that it will happen a second time than it was before the first occasion. If it happens several times successively, the probability is considerably increased. I notice this point, because I think Mr. Row is pushing the argument a little further than he ought when he states that the occurrence of a lucky chance is a reason for expecting it not to repeat itself.

The Rev. Prebendary IRONS, D.D.—Would not that entirely change the conditions of the probability? When Mr. Jones assumes that directly the dice have fallen in the manner suggested, he should come to the conclusion that they were plugged, or not fair dice, he changes his hypothesis at once. I require him to keep his hypothesis as it was, that the dice should be fair dice, and that they should fall in the way suggested, and then I think the doctrine of chances would be rather against him.—I must express my sense of obligation to Mr. Row, whose paper is full of thought, though it does not pretend to exhaust the whole subject. We are bound to recognize thankfully that it will enable all persons who care to do so, to reason out many parts of Strauss's metaphysics, in a way that no other paper which I have seen has yet done. With reference to the general subject, I think the fact is a startling and painful one, that such a philosophical theory as that of Strauss

(and not Strauss's only) should be so popular in these days ; and we ought to ask ourselves how it happens that Christianity, having had possession in the world, having had the field greatly in its own hands for so long a time, should have admitted such an intellectual development as that which we notice in the present day. Surely there must be some grave blot among us, that such a thing could be possible. Is it not that we have been content to soften down the distinctive philosophy of our religion, and accept a very vague and thin theism, instead of the doctrines of Christian theology ; and that that has led men to stray into those indistinct shallows, where the faith of many young and untaught persons will unfortunately be lost ? The fault is clearly our own ; and it can only be removed by our endeavouring, hereafter, not to be so much afraid of deep inquiries\* as some people are. Even the conception of a personal God—the idea of Him in whom we live, and move, and have our being—has been so vaguely contemplated among us for several generations, and especially in our own time, that I can scarcely wonder that things have come to this pass. For the whole of the work of the Christian Church for the first 500 years was intended to clear in the mind of Christians the truth of the Trinity and, in some degree, even the ontology of that awful Being with whom we have to do. The true doctrine of the Godhead, as the very fountain and object of our worship, was proclaimed, as far as human language and thought will admit definition. But after Athanasius lived, and his great work was done, there was an intellectual pause ; and as we, in our days, have fallen back on anthropology, and have rather dimmed our theology, we must take the consequences. Some of these consequences are to be seen in the writings of Strauss and his followers. If we look back, and contemplate the time when this creation was not, we come at once to the greatest difficulty of all theology, the fact that He, who had not created us, began to create. We have to conceive, as St. Athanasius pointed out, how it was possible for the infinite God to begin that form of action for the first time, which we call creation, without any change in Himself ; for we hold Him to be unchangeable. We cannot struggle through this problem without a thoughtful ontology ; and that at the present day is despised as too dogmatic. But people must come back to dogma, and to the conclusions of the Christian schools,—if they do not wish to end with such men as Strauss and Mill.

The Rev. Dr. CURREY.—I do not feel equal to entering upon a discussion of a paper that contains so much matter for thought as this one, for which we are deeply indebted to Mr. Row. I merely rise to call attention to an occurrence which took place in Germany some thirty-three years ago, which shows how the natural instincts of men speak in favour of the existence of a God. The account is to be found in Hundeshagen's *Deutsche Protestantismus*, who quotes from a report, given by an unbeliever, of a meeting which was held by

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\* Lord Bacon has remarked that "a smattering of philosophy leads to atheism ; whereas a thorough acquaintance with it, brings him back again to religion."—Ed.

some of "the freest spirits" in Germany. Certain of those men met together for the purpose of discussing and proclaiming the choicest theories of the freest school of thought, and the witness recording the circumstance says, that one person rose, and after declaring several new views and theories, proclaimed distinctly his disbelief in the existence of a God. The writer goes on to say:—"I found at that time that his remark was ill placed, for though I entirely agree with what he said, still our education as yet is so imperfect, that we are not prepared to receive this statement in the naked form. The result was what I expected. A shudder, followed by a complete silence, passed over the whole assembly; and this occurred in an assembly of the freest spirits of Germany. At last the thought, which I felt sure was in the minds of a large number of those present found vent in the speech of an honest Swabian, who rose up and with a trembling, but distinct voice said,—'Gentlemen, I cannot help expressing a thought that comes into my mind, whatever may be said of it. I have the greatest desire for freedom of thought, but still I cannot help declaring my firm belief that there is a God.' At these words a thrill passed through the whole assembly, a clattering of glasses followed, a shouting and uprising, and the whole assembly seemed as if they had found a friend whom they had lost." I think that this is a strong testimony, especially when we find it given by an unbeliever. (Cheers.)

The Rev. C. M. DAVIES, D.D. — I should like to have some one like Mr. Row with me on the platforms, where I find the atheists and secularists carrying everything before them; for now the weakest possible theists and critics seem to be put forward as so many ninepins for Mr. Bradlaugh and his colleagues to knock down.

Mr. Row.—In replying to the discussion which has taken place, I may say that a very few observations are necessary, for the criticism upon my paper seems to have been confined to one point only. As to the subject of the dice, I treated that as a matter of common sense; and I am sure of this, that if I were to produce a dozen dice, and every time I threw them they turned up aces, there could be but one opinion upon the subject. As an example, I know an instance in which a person had two Turkish bonds—one for £500, the other for £100—who actually, at one drawing, drew both. A broker told me that it was the most remarkable circumstance that had ever come under his notice. But if the owner of the bonds had gone on buying and drawing in the same way, you would have said that there was some cheating at work. Viewing the question as a practical fact, I am perfectly sure there is not a person who does not apprehend the nature of the argument which I used to exhibit the impossibility of these unusual concurrences in nature, which must take place if these theories are correct. A number of such concurrences is like the chances I have referred to, and they must intersect one another in certain points in numbers numberless to render these things possible. I have put it fairly in the point about the oxen; here it is an actual necessity, that events should intersect at the right time and place; and, supposing the herd had to encounter, not a set of

animals capable of butting powerfully, but a set of horses, there would have been no tendency for the growth of the horn. But here you have to assume the perfected recurrence of favourable conditions, and so on for ever. I quoted the dice simply as an illustration. We all feel it is an impossibility for twelve dice to fall with their aces uppermost, and for this to be repeated, say one hundred times. This is the only point which has been objected to in my paper. These adaptations of nature exist in number, numberless; and I am certain the only adequate solution of them is, that the universe is loaded by Deity to bring about a corresponding result. My object has been to test the thing simply from the closest logical point of view, and to see whether these arguments of Strauss and others will bear argument. I think that my paper shows that they will not. Whatever may be said about the theory of evolution, I have distinctly laid it down that there are certain gaps in that theory which it is hopeless to attempt to bridge over. There is a self-consciousness, there is that in the moral nature of man which says "I ought." I do not wish to enter into a discussion about mutation; that was beside the object of my paper; but my object was to take certain data as laid down, and to ask, "Will the conclusions deduced from them legitimately follow?" I quite agree with Dr. Davies, who says that unbelievers are frequently confronted by men of straw, who do not know what they are talking about.

The Meeting was then adjourned.

REMARKS ON THE SUBJECT OF THE REV. PREBENDARY  
C. A. ROW'S PAPER,

BY THE REV. PROFESSOR CHALLIS, M.A., F.R.S., F.R.A.S.

IN bringing before the members of the Institute the following remarks relative to the subject of Mr. Row's paper, namely, "The Principles of Modern Pantheistic and Atheistic Philosophy as exemplified in the last Works of Strauss and others," it is not my intention to criticise the views expressed in that paper, the general tenor of which I entirely assent to. I agree also, in almost every instance, with the particular arguments which Mr. Row has adduced in support of his views; as well the arguments that rest on independent grounds, as those which attack the reasoning of the opponents on their own principles. The only reservation I have to make is, that I think the treatment of the subject is not as complete as it might be, and requires to be *supplemented*. In order to encounter effectually the philosophy of such reasoners as Strauss, Mill, Darwin, &c., it seems to me necessary, not only to expose the consequences of their reasonings, but also to inquire how their modes of thought have *originated*. This inquiry, as I hope to show, turns upon the view that is taken of the essential character of *physical causation*. I ask, therefore, as having devoted a life both to the advancement of physical science by mathematics, and to the study of its fundamental principles, to be allowed to submit for consideration the following arguments:—

1. It is a singular circumstance, not generally recognized, that the philosophical systems of the above-mentioned writers have had their origin in the great step taken by Newton in physical science by the demonstration of the laws of gravitation. Newton proved that two bodies attract each other in proportion to their masses, and according to the law of the inverse square of the distance between them; but did not *prove* that this attraction is effected by means of an *intervening* substance. He has, however, left on record that he fully believed in the existence of such intervention, and that he regarded as "incompetent in philosophy" any one who thought otherwise. Newton's discovery was the first instance of a step taken in a philosophy of *causes*, and gave rise to much speculation as to the quality of the force of gravity. Notwithstanding the expression by Newton of a contrary opinion, the occult quality of gravity came to be believed, and the *actio in distans*, as it is called by German physicists, was generally accepted. Thus it was admitted as a philosophical dogma, that a physical operation might be such as not only not to be understood from sensation and experience, but even to be *contradictory* to what we so understand; for by sensation and experience we understand that body acts upon body by *contact and pressure*.

2. Taking advantage of the above-mentioned admission, Hume proposed, in place of a theory of causation, the hypothesis of mere antecedence and consequence according to invariable law. This idea, which has been very generally adopted by modern metaphysicians, is virtually an abandonment of the reality of intelligible causation, and gives a kind of omnipotence to law. The denial of the possibility of miracles is a logical consequence of accepting it; and, in short, the same dogma forms the basis of all the sceptical and neological opinions that have in recent times prevailed so much in Germany and France, culminating, as it were, in the writings of Strauss and Renan.

3. The natural philosophy of which Newton laid the foundation, and indicated the rules (in Book III. of the "Principia"), leads, when legitimately applied, to conclusions in direct contradiction to Hume's principle of antecedence and consequence without assignable cause. Newton conceived that all the physical forces, inclusive of gravity, might be modes of action of a universal elastic medium (the *æther*), the sensible existence of which is now generally recognized. Such a medium acts necessarily by *pressure*, and, therefore, in a manner comprehensible by us, because we know by personal sensation and experience what pressure is. In fact, on the hypothesis that the *æther* is so constituted that variations of its pressure are always and everywhere proportional to variations of its density, all the modes of its action are such as come within the province of calculation by mathematics. It is thus known, for instance, how *light*, which is one form of physical force, travels by means of the *æther* uniformly with an immense velocity through illimitable space.

4. Besides the existence of the *æther*, the antecedents of physical science point to the fact that all visible and tangible substances are composed of indivisible parts, called *atoms*, to which, on the above view of the nature of the physical forces, there is no need to attribute any qualities other than inertia, and constancy of form and magnitude. The *æther*, the atoms, and the juxtaposition of atoms in definite arrangements and proportions so as to constitute the simpler natural bodies, being given, together with the intrinsic qualities of the *æther* and the atoms, all the elements for constructing the material universe are furnished, as well as all the data required for submitting to calculation the various operations by which it has been brought into its present condition, and is maintained therein. In short, according to this philosophy, all quantitative relations admit of being ascertained by mathematical reasoning; and the mere fact that the word "square" occurs in the enunciation of the law of gravity is evidence that the proof of the law is within the province of mathematical investigation. I am far from asserting that physical science has reached, or even approached, the completeness and comprehensiveness of which I have here supposed it to be capable; it is sufficient for my present purpose to have ground for saying that arguments drawn from its actual condition afford a reasonable presumption that the above statement correctly describes its essential character. (Such arguments will be found in my work on the "Principles

of Mathematics and Physics," which was published in 1869 ; and in a smaller work, entitled "An Essay on the Mathematical Principles of Physics," published in 1873.)

5. I am now prepared to indicate in what respect the Newtonian philosophy, legitimately employed, contradicts the assumption that phenomena can only be accounted for on the principle of mere antecedence and consequence according to law, and that, consequently, it is not possible to understand causes. From what is argued above, it will be seen that in direct contravention of that assumption, Newton's philosophy admits of the existence of no *consequence* the relation of which to an antecedent cause is not cognisable from common sensation and experience. If we had no other sense than that of sight, we might conclude that matter is capable of moving matter without the agency of an intervening substance. But the sense of touch, and our consciousness of will and power, enable us to perceive that matter is acted upon by the *pressure* of other matter in contact with it, and according to the principles of a philosophy which refers all knowledge to personal sensation and experience, no other mode of action is admissible.

6. It is true, however, that thus we do not account for the existence of the æther, the atoms, and the simpler substances composed of atoms, nor for their respective inherent qualities ; because, in fact, these entities constitute the *foundation* of the philosophy. The property of pressing proportionally to its density, which was considered (in Article 3) to belong to the æther, is quite intelligible from what we know of the sensible properties of visible and tangible fluids, in certain of which (as air of given temperature) the law actually exists. Now, although in the case of such bodies this law of pressure might be shown to be due to dynamical action of the æther, inasmuch as all the physical forces (as already argued in Article 4) are to be regarded as modes of its pressure, there is no need to seek for an analogous reason for the same law as respects the æther itself, because the hypothesis of this property is necessary as a foundation for applying mathematics to calculate its motions ; and the law, so far as it pertains to the æther, may be considered to be an ultimate fact.

7. Accordingly, there are *two kinds* of physical realities that human intelligence is capable of taking cognisance of,—those which as ultimate elements or facts constitute the basis of all physical phenomena, and those which are produced from these by causes operating according to ascertainable laws. It is evident that the first kind admit of inquiry only as to their qualities, not as regards any antecedent producing cause ; whereas the other kind are proper subjects of human investigation, both as to the causes producing them, and as to the laws or modes of operation of the causes. The one kind, as having no antecedents, only give evidence of creative power ; the other as consisting of antecedents and consequents, the relations between which are such as we can understand, furnish proofs to us of intelligence and wisdom. The intelligence is of the same kind, however different in degree, as that which the *working of a machine* which accomplishes in an intelligible manner

the purpose for which it was constructed gives of the skill and ability of its fabricator ; for it must be supposed that in calling the elements and their qualities into existence for effecting His purposes, the Creator had prevision of all those consequences from them which we seek to acquire a knowledge of by so much toil in experimental and mathematical research. From the foregoing considerations, it seems reasonable to conclude that the world was created so as to be in reality such as we perceive it to be for the purpose (among others) of making intelligible to us the wisdom, as well as the power, of the Creator ; and that for the same reason "all things have been ordered in number, measure, and weight." (For more that might be said on this part of the subject I beg to refer to the concluding portions of the two works I have already named.)

8. The possibility of a miracle, which the writers before mentioned refuse to admit, as being repugnant to the principles of their philosophy, is quite consistent with the views maintained above, according to which a miracle may be said to be performed by an exercise of power of the same kind as that which created the constituent elements of substances, and endued them with qualities, and which can, consequently, change them in any manner, and even destroy them. The extension of this power to the creating, altering, or destroying, the combinations and arrangements of atoms whereby organic as well as inorganic bodies are constituted, must be conceded to be possible on the principle that whilst from personal acts and consciousness we can understand what it is to make or create, we are wholly unable to assign limits to the creative power of the Maker of the universe. (I shall have occasion subsequently to cite this assertion.) Of course, a miracle, however performed, as being a superhuman act, is to be regarded as the act of the Creator and Upholder of all things, although human agency may have been concerned in the performance of it. It seems, in fact, to be sufficiently established by testimony that on particular occasions, and for special reasons, miracles have been wrought in answer to the prayers of righteous men gifted in a high degree with understanding and faith, but not the less are they wrought by the power of God.

9. The conclusion I draw from the preceding arguments is, that the *πρωτον ψευδος*, or radical fault, in the commonly received systems of physics and metaphysics, lies in the acceptance of the doctrine of invariable antecedence and sequence, to the exclusion of the consideration of causes. This belief may be said (in words that occur in the Book of Wisdom) to be "a betrayal of the succours of reason." It seems, in fact, to influence in various and singular ways the intellectual faculty of those who hold it. Possibly we may thus account for the mental peculiarity which, as mentioned in Art. 8 of Mr. Row's paper, "considers it possible that in some distant region of the universe two and two may make five." Others of the same way of thinking have imagined it to be possible that somewhere space may have more dimensions than length, breadth, and depth. Another instance of false conception, having, it seems to me a like origin, is referred to in Art. 87 of Mr. Row's essay as having been relied upon by Strauss for supporting some of

his metaphysical views, namely, the conception that, "under certain conditions motion can be transformed into heat." It is an undoubted axiom of natural philosophy that motion *per se* is just as incapable as *rest* is of producing motion. But heat is essentially a mode of force, and can produce motion. Hence heat and motion are heterogeneous entities, and inconvertible one into the other; so that Strauss, misled apparently by reliance on faulty principles of philosophy, cited in support of his argument a physical impossibility.

10. But the most signal instance of irrational misconception is that of Hume himself, who failed to see that his system, by which he supposed miracle was excluded, requires a continual recurrence of miracles, inasmuch as a succession of events for which no intelligible cause is assignable is, for that reason alone, miraculous. There are, however, physical circumstances to which Hume's principle of mere antecedence and consequence strictly applies, which, in fact, I had occasion to discuss in the communication I had the honour of making to the Institute on the 5th of last January. I allude to the circumstances that sensations of musical sounds are immediately preceded by vibrations of the air, as are those of colour by vibrations of the æther, although the relation between the sensations and the operative physical conditions is one of mere antecedence and consequence, inasmuch as by no human cognisance or research could it be anticipated that such antecedents would have such consequents. The sensational consequents are such as they are by the immediate volition of the Author of our being, and, therefore, come under the category of miracle.

11. I propose now to say a few words on the principles of Darwinism. The chief remark I have to make on this subject is, that the same radical fault runs through Darwinism as that I have pointed out as being involved in the received physical theories,—the fault of not making the proper distinction between what has received existence by immediate creation, and what has been derived therefrom by causes operating according to intelligible laws. There is, however, this remarkable difference, that whereas in physics too little has been ascribed to evolution,—the derivation, for instance, of the law of gravity from antecedently-created conditions having been overlooked or denied,—in Darwinism, on the contrary, so much has been ascribed to natural development that the idea of antecedent creation is almost got rid of.

12. The following arguments apply directly to the organisms of plants, but *mutatis mutandis* may be taken to apply to those of animals. Naturalists tell us that the most elementary constituents of organic matter, whether the organism be in a state of growth or decay, are hollow vesicles, or *cells*. Let this be granted as admitting of experimental determination. But how a combination of cells, which have apparently no inherent principle of vitality, might *originate seed*, we are not told. Sir William Thomson, when President of the British Association at Edinburgh in 1871, broached the hypothesis that seeds might be conveyed to the earth by *aërolites* projected from distant planets, or other cosmical bodies; whereupon every one, scientific and non-

scientific, exclaimed, "This shifts the difficulty without removing it, for the existence of these extra-mundane seeds is still to be accounted for." The circumstance that so eminent a scientific investigator should have had recourse to such an hypothesis to give a helping hand to Darwinian views is not only evidence of their weakness, but shows also wherein they are weak. It was, in fact, an admission that natural development will not account for the origination of seeds of plants. Now, if the generation of the different species of plants and trees cannot be ascribed to that process, it would seem to be wholly unreasonable to say that natural development, or natural selection, might effect the generation of different species of animals. It can by no means be conceded that the process in one case had no analogy to that in the other.

13. If, then, it should be asserted that the existence at any time of seed of any kind can only be due to the anterior or simultaneous origination, by creation, of the complete form of the plant or animal of which it is the seed, I maintain that, for the reasons above given, the principles of Darwinism cannot be legitimately adduced to controvert this assertion. Notwithstanding all that the advocates of that system may say, we shall be at liberty to attribute the origination of seed to the creation of perfect specimens of *each species*. This inference, which so far has been drawn from physical considerations, accords with the account of the creations of plants and animals given in the first chapter of Genesis. It is particularly to be noticed that in what is said in verses 11 and 12 respecting the creation of herbs and trees, the assertion is expressly made that "the seed of each is in itself after its kind." The way in which seed is thus spoken of in connexion with the creation of herbs and plants, is plainly consistent with the hypothesis that the seeds of different species have come into existence, not by development of one species from another, but by original creation of examples of each species. Although the above citation refers only to the vegetable kingdom, it may by analogy be taken to embrace the animal kingdom.

14. The Scriptural accounts of the creation of Adam from the dust of the ground, and of Eve from a rib of Adam, are quite consistent with the foregoing argument, according to which a single pair, at least, of the human race must have been *created*. It would be altogether unphilosophic to cavil at the specified modes of the creation, because, as already urged in Article 8, it is not possible to assign limits, whether as regards mode or extent, to the creative operations of the Framer of the Universe. It is worthy of notice that the possibility of such creations as those recorded respecting Adam and Eve was asserted by John the Baptist when he said,—“God is able of these stones to raise up children to Abraham.” If the power of the Creator could be conceived of as having limits, there would cease to be meaning in the words, “Almighty,” “Omnipotent.” The particular modes of the miraculous creations of Adam and Eve have special significations, as indeed the miracles of Scripture always have. Adam, we are told, was made of the dust of the ground to indicate the terrestrial and unobiding character of the outward man; and Eve was made of a bone of Adam to signify the intimate

relation that exists between husband and wife. Being originally created as to bodily form perfect man and perfect woman, they were unitedly and severally endowed with intellectual and moral qualities of the same kind as those of their Maker, and in these respects were created in His image.

15. If the foregoing arguments be good, any attempt to trace the origin of animals and of man to an oyster or a monad is altogether chimerical. Nature affords no data for an investigation of the generation of species. What Darwin says about *the generative effects* of "natural selection," "the survival of the strongest," &c., can only be empirical assertion, admitting of no verification from observation or experience. The kind of "development" the laws of which nature *does* afford the means of investigating, and which to my mind is the most wonderful of all natural operations,—more wonderful even than the construction of the heavens and the regulation of the movements of the heavenly bodies,—is that by which a plant or animal passes through successive stages from the seed to the complete organism. What, for instance, can be more astonishing than the development of the chick from the egg by the mere application of animal heat? The supporters of Darwinism, as Professor Huxley, are fond of adverting to the fact that at a certain stage the fœtus of a child differs but little from that of a puppy, as if such resemblance favoured the idea of development of species from a common origin. Here again, as it seems to me, is an instance of perverse judgment arising out of the admission of radically false principles. The similarity above mentioned gives no countenance to Darwinism, being only an example of *economy*, such as is characteristic of natural operations, according to which out of a general scheme or type of development, the most wonderful varieties of effect are produced, owing entirely to original differences existing within the small compass of the seed. How different, for instance, in the case just mentioned is the final development of one fœtus from that of the other! The study of the laws of these developments belongs to two distinct and most interesting departments of natural science, Organic Botany and Physiology, for the prosecution of which Nature gives ample data by presenting to our view, or offering for our researches, vegetable and animal life in all varieties of function, and all degrees of complexity, from "the hyssop that springeth out of the wall to the cedar of Lebanon," and from the ennerite and the oyster to the perfect organization of the human body.

16. I conclude by expressing the opinion, justified, I think, by the foregoing arguments, that so far from Darwinism being capable of giving support to Pantheistic and Atheistic Principles, it has no basis of its own to stand upon.

## ORDINARY MEETING, JUNE 16, 1873.

H. CADMAN JONES, ESQ., IN THE CHAIR.

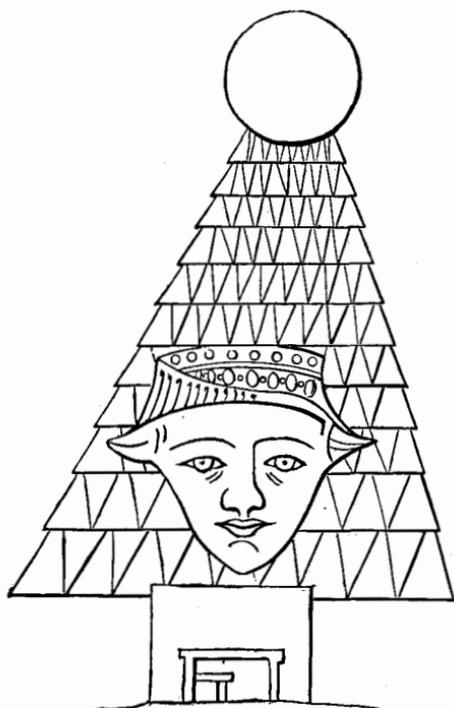
The Minutes of the last Meeting were read and confirmed, and the following Elections were announced :—

MEMBERS :—The Lord A. Churchill, 16, Rutland Gate ; J. Bateman, Esq., M.A., F.R.S., F.L.S., 19, Hyde Park Gate South ; W. J. Coleman, Esq., 2, Park Place, Blackheath ; N. B. Downing, Esq., Clarence Villa, Penzance ; Rev. R. Gunnery, M.A., Carlsruhe, Hornsey ; Rev. A. A. Isaacs, M.A., Leicester ; J. Penn, Esq., F.R.S., Lee, Kent ; C. B. Radcliffe, Esq., M.D., 25, Cavendish Square.

ASSOCIATES :—Right Rev. Bishop Ryan, D.D., Bradford ; Rev. A. I. McCaul, M.A. (Lect. in Hebrew at King's Coll., London) ; Rev. S. Charlesworth, Limehouse ; Rev. E. C. Ince, M.A., Battersea ; I. P. Montagu, Esq., 51, St. George's Road, Pimlico ; S. Sanders, Esq., M.A., 28, Gloucester Place, Hyde Park ; G. Sexton, M.A., M.D., Ph.D., &c., 17, Trafalgar Road ; Rev. J. Sinclair, 2, Rochfort Cottages, Victoria Road ; Rev. W. S. Tomkins, Castle Cary ; Rev. J. T. Waddy, Lincoln ; Rev. B. W. Wright, M.A., M.D., Norton Cuckney.

Also, the presentation of the following works to the Library :—

- "Transactions of the Royal Society." Part 144. *From the Society.*  
 "Transactions of the Royal Institution." Part 58. *From the Institution.*  
 "Transactions of the Royal United Service." Part 71. *Ditto.*  
 "Ancient Flint Implements of Great Britain." By J. Evans. *From L. Biden, Esq.*  
 "Flint Fallacies and Facts." By Rev. W. Robinson. *From the Author.*  
 "Temperature of the Sea." By N. Whitley, Esq., C.E. *Ditto.*  
 "Repository" (June). *From Rev. J. Sinclair.*  
 "Evidences of Christianity." By Prof. W. Smyth. *From S. Vincent, Esq.*  
 "History of England on Christian Principles," By Rev. W. H. Walter, B.D., F.R.S. 7 vols. *From S. Vincent, Esq.*  
 "Human Nature." By H. Boase, M.D., F.R.S. *Ditto.*  
 "Knowledge of Divine Things." By J. Ellis, D.D. *Ditto.*



The head of Osiris above the chest of Typhon, and beneath the sun, which is supported on a pyramid of emblems of fire and water. From the temple at Tentyris, Egypt.



The god Nilus, with the sources of the Nile flowing into the Ocean. Tentyris.



An early Occidental habitation similar to the chest which enclosed Osiris, *suprd.*

- “Record of the Creation.” By Archbishop Sumner, D.D.  
*From S. Vincent, Esq.*
- “Sacred and Profane Literature.” By R. Gray, D.D. *Ditto.*
- “Verbal Inspiration.” By Rev. J. Baylee, D.D. *From the Author.*
- “Glory of the Great Pyramid.” By E. Heine.  
*From Prof. C. Piazzi Smyth.*
- “On an Equal Surface Projection and its Anthropological Applications.”  
 By Prof. C. P. Smyth. *From the Author.*
- “Earth Commensurable Measures.” By the same. *Ditto.*

The following Paper, illustrated with numerous diagrams, photographs and specimens, was then read by the Author :—

*ON PREHISTORIC TRADITIONS AND CUSTOMS  
 IN CONNECTION WITH SUN AND SERPENT  
 WORSHIP (with Subsequent Notes). By J. S. PHENÉ,  
 Esq., LL.D., F.S.A., F.R.G.S., &c.*

**I**N approaching the subject indicated in the title of this paper, I propose to do so in the first instance by a slight sketch of natural and first impressions, for the purpose of weighing the influence they may have exercised on the peculiar worship under consideration.

2. Over the wide world are evidences of what, *primâ facie*, seems so strange and repulsive a custom, that those who hear of it for the first time may be excused expressions of incredulity and disgust; yet, although there is a popular adage that “vice has only to be seen to be abhorred,” experience proves to us that it depends very much upon the garb in which we see it, what amount of abhorrence, if any, will be accorded. So we have examples of those in whom disgust would most probably show itself prominently towards the features of that to which I allude, being drawn, either from ignorance of danger or by a species of fascination, to display towards its symbol at least, admiration rather than disgust, and fondness rather than repulsion. I refer to the almost universal prevalence of serpent-worship in ancient times, the extant remains of which are still to be found on probably all the continents of the earth.

3. The effect upon a person hearing for the first time of the worship of an idol—an actually fabricated god—is, as a rule, one of surprise and pity; but on hearing of the worship of a serpent, it is one of disgust and abhorrence. These feelings are very much the result of education, *i. e.* a knowledge of the dangerous properties of serpents, as it is shown from several recorded instances of children petting snakes they had disco-

vered,\* and of the fondness and reverence exhibited by the priestesses of Pythons, to the good offices of which deities they assumed they were entitled, that, in the absence of a knowledge of danger, fear and repulsion are not necessarily felt. It becomes a question, then, at the outset, whether or not a great part of the worship devoted to serpents has arisen directly from fear of their destructive powers; and this is a feature we cannot altogether discard.

4. But this which might appear, *primâ facie*, as a sufficient cause, must be very much modified when we look a little more closely into the matter. Thus we find in Egypt a good and a bad serpent,—the goddess Ranno (fig. 35), the god Apophis (fig. 36),—the one considered worthy of adoration, the other styled “the great enemy of the human race,”† which was to be opposed or else propitiated. The latter is gravely reported to have been once captured and brought to Alexandria in triumph;‡ and the question naturally arises, How did the other serpent become invested with good attributes?

5. I can not only easily imagine, but it seems impossible to conclude otherwise, that man, simply as man, by which I do not mean a creature in a condition of development from the lower animals, but a wanderer from the home or original hive; a voluntary apostate, seeking forgetfulness of the past in new scenes and distant localities, and dreading his god, from whom, as well as his own race, he was fleeing in dismay; having, moreover, a passion implanted in his breast—that of worship—which neither time nor distance could obliterate; that man, as such, and in such condition, and having still before him the recollection of attributes recognized by others as those belonging to his late god, but which he refused to acknowledge, and which combined grandeur, beneficence, and creative power, must perforce have elected to worship the only representative he could find possessed of any such qualities; namely, Nature, through which, in short, these very powers of his offended god had so far been visibly manifested, and that the first direction of his new worship would be terrestrial; § the second, which he would willingly have shunned, but neither dared nor could dispense with, celestial. At such a period of his experience,—and I am assuming the earliest, the Ocean would have presented a dreary and unknown

\* A curious illustration of fondness for serpents exists at Chelsea at the present time, which has led to alarm in the neighbourhood.

† Samuel Sharpe's *Hist. of Egypt*, vol. i. p. 58.

‡ Diodorus Siculus.

§ So strong was this feeling, that Berosus described Xisuthrus, *i.e.* Noah, on coming out of the ark after the Flood, as first paying his *adoration* to the *Earth*, and then sacrificing to the gods. (Dr. George Smith.)

waste, an eternity of waters, subject to as violent commotions from storm and tempest as his own troubled mind, and again relapsing into a state of calm and purity even more harrowing, by recollection, to the distracted and restless wanderer.

6. Into that Ocean however went, continuously, as it appeared, the only objects that would now seem to him of interest,—his new gods; the sun, followed by his constant satellites; and the refresher and revivifier of his other god,—the earth—indeed a feature of it—the river. This is strongly borne out by Egyptian representation. The frontispiece depicts a very remarkable hieroglyph in the portico at Tentyris; the sun supported on a pyramid composed of the symbols of fire and water, with the head of Osiris in front, placed over the cist or chest in which Typhon imprisoned him. The characteristics of Osiris are shown in his negro lips and in the horns of the bull Apis. From the details the meaning of the figure is apparent; all the symbols of fire are incomplete, the apices being absent  $\Delta$ ; all those of water, on the contrary, are perfect  $\nabla$ ; the pyramid is not a true one, but elongates to the left, or west; the head of Osiris is placed studiously in the western elongation, *i.e.* towards the left or west; the rays slant; and on the left of the cist is an extra enclosure.\* It is clear that this refers to the sun setting in the ocean, water being shown by the perfect symbol, and fire by the deficient one. Moreover, the whole is canopied by a vast female figure, whose garments covered with water-lines clearly represent the Ocean, not the Mediterranean towards the north, but the vast ocean supposed by the ancients to surround the world, as we are told by Herodotus; and which ideal surrounding is completed in the hieroglyph in question, by an equally vast oceanic figure opposite to the above, the hands and feet of both meeting each other. Osiris wearing the horns of Apis in this case strengthens the simile, as Apis, Hapi, or Hapi signifies in Egyptian to conceal.† Beneath the above I have placed a hieroglyph from the same temple, representing the god NILUS holding the sources of the NILE, which, issuing in *serpentine* forms from his hands, and being lost in the ocean, fulfil the remainder of the metaphor I have chosen.

7. The people we call Egyptians probably reached Egypt

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\* The interior of this chest, with its western chamber, corresponds so exactly with one of the old Irish dwellings that it almost seems to indicate the sun going towards the land of a people having like habitations and living westward. A drawing of one is placed at the foot of the chest under description.

† Bunsen, vol. i., Vocabulary, page 462.

from Asia Minor, and their first associations would in that case familiarize them with the idea of the sun setting in the Western Ocean. From their geographical position, the persons we call Orientals (by which I mean those dwelling at the eastern end of the Mediterranean), would observe the sun going into the waters at night, but not rising from them in the morning, as we islanders do. The sun-worshippers it would seem, as I have pointed out in a paper in the *British Archaeological Journal* for March, 1873, were in the habit of worshipping the sun *when he appeared on the tops of the mountains*. I do not think the people, as a rule, ascended, but only the priest, who was seen enveloped in his glory. Indeed, it is found that the inscription on the Moabite stone contains an expression רָקַע (daybreak)\* not known in the Hebrew writings, the nearest approach to which is, "like morning spread upon the mountains," described by the same writer as a time of darkness; *i. e.* idolatry—their idolatry being sun-worship.† Hence such a person as I have assumed would see a similarity in this common act of the sun and the river, the two agents through whose means the earth was fertilized.

8. The river, then, would become in particular an object of veneration. Now, with regard to Egypt, where the sun and serpent were both worshipped, let us take an idea from the description of a late popular writer as to the appearance of the Nile (I prefer such an opinion to that of an antiquary or man of science, or any person having an idea to clothe). He describes the view from a lofty summit thus: "A vast level panorama, bounded by the chains of the Arabian and Libyan hills, lay spread before us, diversified with every shade of green, and watered by the Nile; *creeping, like a silvery SERPENT, through the green savannahs.*"‡ That which meets the eye of the traveller now, so far as nature is concerned, met it then, and, in the eyes of the devotee, the river was a giant god, of which the serpent was but a symbol. Moreover, while it has been frequently suggested that the annual renewal of the serpent's skin would be construed by the observers of nature into a renewal of life, and by inference into the property of immortality, it has never, I think, been pointed out that this

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\* W. P. Walsh, quoting Professor Davidson.

† Joel ii. 2.

‡ Warburton, *The Crescent and the Cross*. It is remarkable that the Hebrew word for green vegetation, רָעַנָן (Cant. i. 15) is almost identical with the name of the goddess Ranno, goddess of harvest, &c.—See p. 2. (W. R. Cooper.)

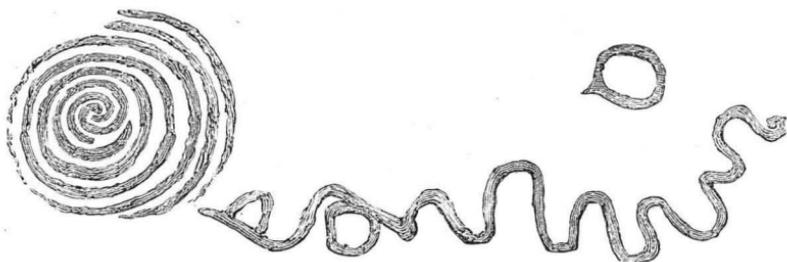


Fig. 1. Ornament in Dowth. (From a Rubbing. By J. S. Phené.)

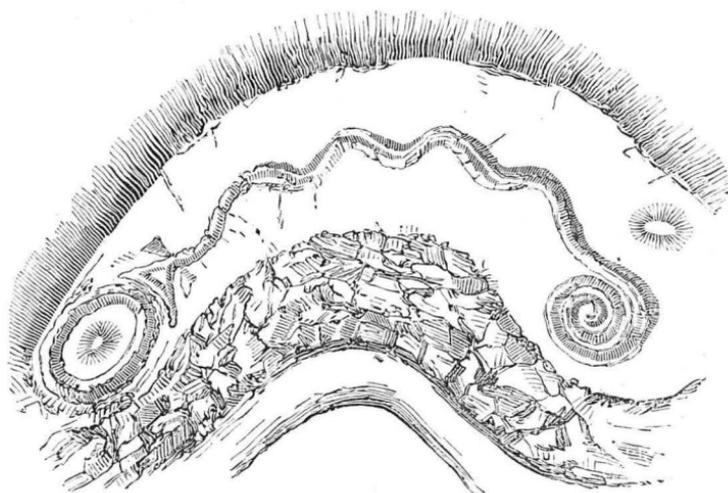


Fig. 2. Serpent and Mound, Ohio.

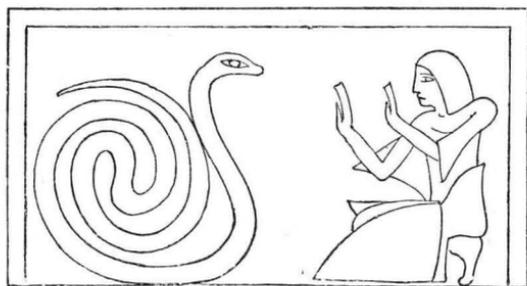


Fig. 3. Egyptian.



Fig. 3a. From New Grange.

peculiarity would cause the serpent to be tenfold more sacred in Egypt than elsewhere, as it would identify it with the renewal of the very life of Egypt itself in the annual revivification by the Nile, which, casting its heavy slough of mud, gave new earth and new water to its worshippers. It was the sacredness of the Nile that made sacred every animal and plant that lived in or emerged from it.

9. There is something very curious also in this symbol as used for the Nile. I admit the evidences are startlingly remote, but that makes it the more curious. In Scotland,\* Ireland, and America is a serpent symbol, as shown on my diagrams (figs. 1, 2, compare these with fig. 21), which in each case has a triangular head or mouth, exactly corresponding to the delta of the Nile; and in the case of the great American serpent mound in Ohio, the effigy appears to be presiding over three mouths of rivers. This, however, I merely mention incidentally, though the details are so exact that it gives evidence of a common symbolism; the orb, a characteristic feature in the Egyptian representations, being also in each case found with this delta-mouthed serpent form. It is very remarkable that the honey cakes carried in golden baskets by noble virgins for the purpose of an offering to, and at the same time the food for, deified serpents, were ornamented with the sacred Omphalos; that is, a boss, on which was described a spiral line, which some think was itself a representation of a serpent (figs. 3, 3a). A glance at the diagrams from Dowth, and that marked with the letter I, will show at once that it would hardly have been possible to design the Omphalos and the serpent more clearly; and the ceremonies of the Omphalos can be distinctly traced to Egypt.

10. To return to the subject. We have traced the supposed wanderer to his distant retreat, and followed his institution of new gods, the sun and the serpent; for his first god—the earth—would soon sink into insignificance in comparison with the powers that made the earth fertile, and as his knowledge of them increased.

11. Man, new from intercourse with the Supreme, was not yet sunk to the level of being satisfied with a passive deity; such, and grossly sensual divinities, were reserved for still greater degradation, or atheistical distance. We have an example in the case of the Greeks, who, while the philosophers and higher classes worshipped the gods of government, war, speed, music, poetry, sculpture, love, and wisdom, appropriated to

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\* The first I assume from Dr. James Fergusson.

the degraded populace the vulgar Pan and the drunken Bacchus.

12. The grandest features of the earth, especially where connected with activity, still remained objects of reverence. In my inaugural address in 1870, on the opening for philosophical purposes, under the presidency of the Earl of Glasgow, of Sir Peter Coats's splendid gift to the town of Paisley, the Free Museum and Library, I pointed out that mountain-worship was evidently a feature in ancient religion, and one which had received too little attention. I cannot fail to recognize the ever-burning fires on the summits of the pyramidal temple in Mexico, and I have no doubt originally on the pyramids of Egypt, as being suggested to the worshippers by their contemplation of the terrible and sublime in the peaks of burning mountains; I further pointed out on that occasion my belief that the Egyptians had *erected the pyramids to supply the place of mountains* near their abodes, on the sandy plains of Memphis, as proper spots for worship. My address was extensively circulated at the time, and I now find the same remark in a work lately published by the Rev. Mr. Zincke, on Egypt,\* and highly eulogized by the *Spectator's* reviewer, who quotes Mr. Zincke as follows: "We may be absolutely certain that had they (the Egyptians) lived in an alpine country, though they might have commanded the requisite materials on easier terms, they would never have built the pyramids, for then an Egyptian pyramid would have been a pigmy monument by the side of Nature's pyramids; *but, built as they were in Egypt*, and seen from the neighbourhood of Memphis and Heliopolis, *they were veritable mountains.*" I have not the least intention of questioning the perfect originality of Mr. Zincke's idea, but I must claim the first publication of it.

13. I look upon it as one of those coincidences arising from any science or study having arrived at a point which must produce new ideas and results, and which we find, as in the case of the electric telegraph, in that of the late invention of instruments to observe the solar photosphere, and also in the labours of Leverrier and Adams, led workers, having no previous communication, to very similar opinions and results.

14. But how are we to incorporate the idea of an evil serpent power with a symbol chosen to represent the beneficent river? Are we to suppose that there was simply a recognition of the actual serpent as an object of dread? Then why choose it at all as an emblem of good? There must be something more in this.

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\* *Egypt of the Pharaohs and of the Kédive*, by F. Barham Zincke. Smith, Elder, & Co.

15. Let us look a little closer at some of the attributes of these gods. The magi,\* we read, authorized the use of fire and water as the *only* emblems of their gods. As the powers represented by the sun, and the serpent-river had to act in unison, if I may so express it, or cease to be efficient, we soon find the sun and serpent combined, and recognized by some worshippers as one and the same; the sun representing the head of the serpent which entwined the world, as symbolized by the circle in which the serpent holds his tail in his mouth (fig. 4). Here, then, we find an emblem which embodies also the idea of the Greek Phoebus, or the "far-shooting Apollo"—the sun—who shot to death the Python, or serpent, or, in other words, destroyed its identity by amalgamating it with his own. An emblem, moreover, seen in the Assyrian representation of Asshur (fig. 5), being a god with extended wings, *bow in hand*, in front of a circle, or wheel. If any ambiguity appears, as to the wheel representing the sun in the emblem of Asshur, I may point out that such emblems often concealed the exact intention, as on the reverse of a Gnostic gem, where, on the obverse, we have the sacred serpent with the solar halo (fig. 6), which would also be understood by the initiated under the sections of triple folds shown on the reverse (fig. 7), while the uninitiated could make nothing of it beyond three folds on a staff or bar. We see this enigma explained beyond question in the Phœnician serpent and tree (fig. 8). And we have in the emblem of Mercury, who was, of course, the messenger of both *good and evil*, the *two serpents*, and the staff or tree in the caduceus (fig. 9). In another Assyrian representation † of a deity, we find the winged orb, formed by a serpent circle, which also forms the body of the god, who, instead of the bow, holds a smaller serpent circle in his hand, probably a symbol of the moon (fig. 10). This deity is supported on a pedestal composed of several rings, three being together and one separate; all of which are covered with the mystic emblems of fire and water, viz. the upright and inverted triangles.‡ In a Bhuddist emblem, we find a serpent intervening *between the points of these triangles* (fig. 11); while, on the Babylonish monuments, the serpent figures in chief with the sun, moon, and stars above him. American Indians as late as 1741 tattooed a serpent on the chest, and a star on the left breast, and had sun and serpent emblems (fig. 12). The object in the hand of the Indian (from an

\* Diogenes Laertius; Clemens Alexandrinus. † Bryant.

‡ The immense urn exhumed by me on the Marquis of Lothian's estate in Roxburghshire, the result of a fragment found upon the surface, is unmistakably marked with these emblems, and is, I believe, an *unique* example. An illustration is in the *Graphic*, February 22nd, 1873.



Fig. 4.



Fig. 5. Asshur.

CHNUPHIS.

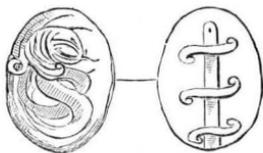


Fig. 6.

Fig. 7.

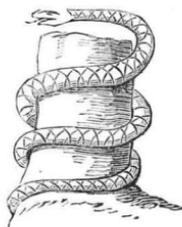


Fig. 8.

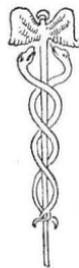


Fig. 9.



Fig. 10.



Fig. 11.

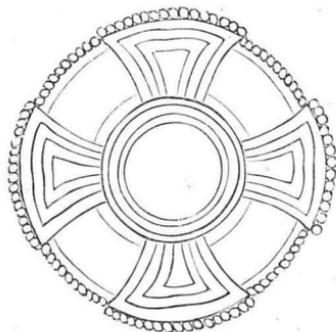


Fig. 13.



Fig. 14.

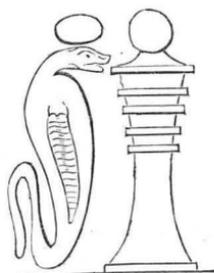


Fig. 15.

illustration by Deane) cannot but recall the remarkable passage in the Acts (ch. vii. v. 43): "Ye took up the tabernacle of Moloch and the *star* of your god Remphan, figures which ye made to worship them, and I will carry you away beyond Babylon." In other words, you shall be captives in the land whose idols you have chosen. It is remarkable that in the Arthurian order of the Garter the cross in the centre of the circle agrees with that of Asshur, and the rays assimilate in each case; while, if we go further east, the order of the Golden Fleece has the *exact* form of that in the wheel of Asshur (fig. 13, and *supra*, fig. 5), which latter the Assyrian sculptor has studiously sacrificed drawing to delineate, showing that the form had a meaning; and these early orders it must be borne in mind were all mystical, and even mythological. The examples will be seen in diagram Q.

16. Although the sun, the serpent, and the sun-serpent were all worshipped before the Greeks went to Egypt, it is not improbable, as the Greeks worshipped Apollo, and the Egyptians the serpent, that the fable of Apollo destroying the serpent may also have received fresh force from the ultimate supremacy of the Greeks over the Egyptians, though apart from nature-worship, it probably arose as symbolical of the Greek and Trojan warfare. Once established, from whatever origin, the idea would of course receive accretions.

17. But the far-darting Apollo, though presiding over the Muses, was apt to send darts which had a baneful influence; and here, also, we find opposite attributes; they could hardly both be innate, and therefore we must look for an explanation in his amalgamation with the serpent. But are we then to suppose the good and bad serpent powers were both embodied in him? If not, whence is the bad?

18. Let us look further. In the figures 14, 15, 16, the Egyptian serpent, known as the Uræus, is shown in positions with the orb, or sun, so often surmounting its head, to say nothing of its other positions, such as issuing out of the sun, &c. (fig. 16a), that the sun for the serpent's head is no longer a matter of conjecture; while in the representation in figure 17, we see the Phœnician serpent deity with its head surrounded with a nimbus, or halo, as of the sun itself, curiously enough reproduced as one of the supporters to the arms of the Highland clan Donnachie. But the arrows of the "far-shooting Apollo" brought him many a victim; and the Phœnicians sacrificed human victims to their deities: we find, then, a good and an evil influence represented here also, for that they considered their deities had good attributes we cannot doubt.



Fig 12.



Fig. 16.



Fig. 16a.



Fig. 17.

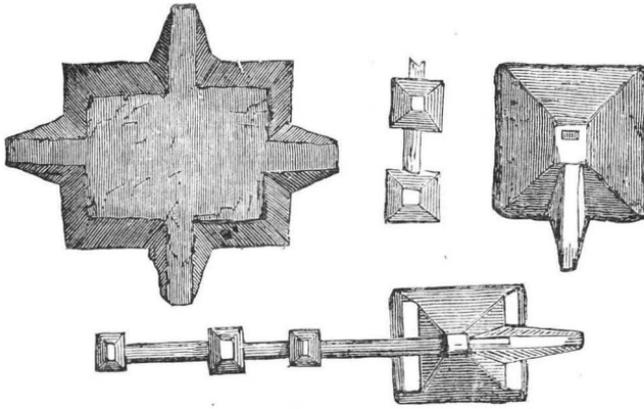
19. Let us go further afield. On the west coast of Africa is the kingdom of Whidah, where the serpent was, till recently, worshipped by two different people or tribes; but although violent antagonism existed as to the qualities of their deity, or the mode of worshipping him, they both agreed in this, that a *human sacrifice was the most acceptable offering to their serpent deity*; and we know, from the recent slaughtering by Dahomey, that the custom of man shedding man's blood was, may I say, naturalized in that district.\* Asthey also attributed benign powers to their god, the mixture of good and evil is again apparent. The name of the deity here is Obion, and indicates the sun, "On," and the serpent, "Ob."† In Mexico we find, not only extensive evidences of serpent-worship, but emblems assimilating to the Egyptian; not only are there vast pyramids, shorn of their apices, as in Egypt (figs. 18, 18), but the ringed serpent is even more explanatory than that already mentioned. It is formed by two entwined serpents, the heads of which meet face to face. One is represented as old and bearded, the other as young and vigorous, clearly indicating the new day about to drive away the old night. These are represented in figure 19, and are in position for comparison with the simple ring formed by the serpent biting his own tail (fig. 4, *suprà*). The Mexican emblems are placed vertically, and in such a position that the new day, or new year it may be, represented by the more youthful serpent, is shown as being not yet quite risen, the head of the old serpent being uppermost. Fig. 19a is Egyptian, and shows the same idea of duality.

20. Again, amongst the animal-shaped mounds of America, we find one device, somewhat rarely, it is true, but which is very remarkable in form, indeed unmistakable; it is figured in the *Smithsonian Contributions to Knowledge*, and is a distinct representation of the winged sphere of Egypt, which is likewise almost identical with that of Asshur, previously mentioned, as found in the Assyrian sculptures, which are all shown in the diagrams (figs. 20 a, b, c); but beyond this is the fact of unmistakable enormous *serpent similitudes* found in America, several of which are in my illustrations. (Fig. 21; compare with figs. 1, 2, and 3, *suprà*.)

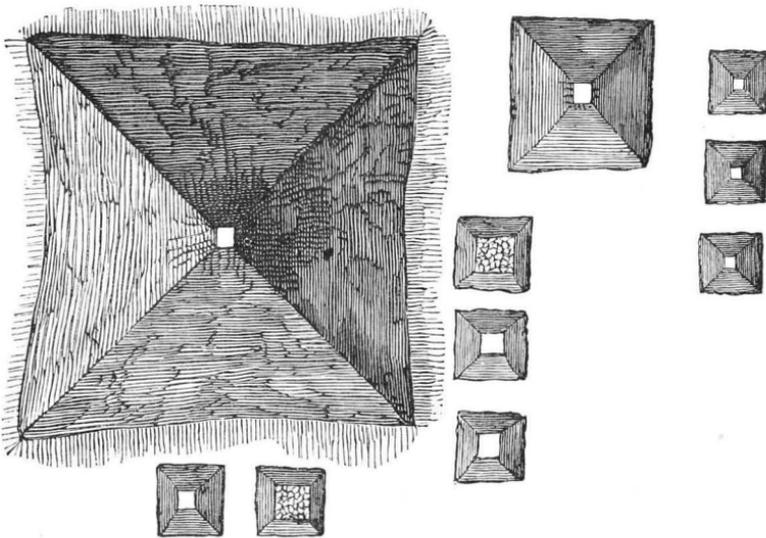
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\* In a communication just made (January, 1875) to the Geographical Society, the writer, at the supposed source of the Nile, states that each time he visited the king several persons were decapitated as a mark of respect to him, the visitor.

† See the author's paper read before the British Association, at Brighton, in 1872, and contained in the official report of the Association, viz., "On some Evidences of a Common Migration from the East."



Figs. 18. Pyramids, Mississippi, America.



Figs. 18. Pyramids of Ghize, Egypt. (Denon.)

21. The mound-builders, whoever they were, can be almost certainly traced from the city of Mexico to the Gulf, and thence northwards up the Mississippi; and the mounds, as well as the ancient ruins, exhibit the serpent prominently: hence their worship of the serpent appears conclusive; and we find, moreover, that they were sun-worshippers, or, rather, Sabian worshippers also, as disks, representing the sun and moon, have been excavated from the mounds, and even a figure representing an astronomical observer (fig. 22) from one of their ruins. Sun-worship in Canaan was symbolized in the same way,—the habit had been contracted by the Hebrews, who used in this worship “sun images,” which Asa is recorded to have taken away (2 Chron. xiv. 5).

22. Here then also we have identically the same worship, and with it we find the same addiction to human sacrifice; moreover, ‘he god or gods must have been considered beneficent, as the victim, according to Prescott, went through a state of preparation to fit him for the glorious result of his voluntary act, and was decked with flowers and external emblems of felicity, showing a further confirmation of the good and evil attributes. The human sacrifices in Canaan are fully recorded.

23. In the Hindoo Pantheon we find a curious instance of the mythical properties of a serpent deity (fig. 23). Crishna, being in jeopardy on one occasion, caused an immense serpent to appear, into the mouth of which he, his followers, and his flocks, entered and took refuge. The fable is illustrated in one of the diagrams, and seems to me to imply voluntary immolation to the serpent god; or it may have reference to an erection constructed for defence, in the form of a serpent deity,—a sanctuary in short,—as we find in an ancient Mexican book \* an account of a temple, *circular* in form, and the *entrance representing the mouth of a serpent*, opened in a frightful manner, and extremely terrifying to those who approached it for the first time. Here in the circular form we have again the ring, the emblem of perfection or eternity, combined with a visible representation of cruelty. Figs. 24 and 24a give examples of similar refuge. The one represents the god Nilus, surrounded by the protecting influence of the eternal serpent. The other a mother and child protected by Chnuphis. On the point of human sacrifice there is one object of it not perhaps so clearly proved to be universal as that of the sacrifice itself, yet sufficiently so, by its wide diffusion as a custom, to make its universality probable: it constitutes a feature, moreover, entirely of the apostate class, viz.:

24. Divination by the death of a victim. This was practised

\* Quoted in J. D. Baldwin's *Ancient America*, p. 28.



Fig. 19. Mexican.



Fig. 19a. Egyptian.

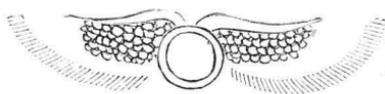


Fig. 20. Egyptian Sculpture.



Fig. 20a. Assyrian Sculpture.

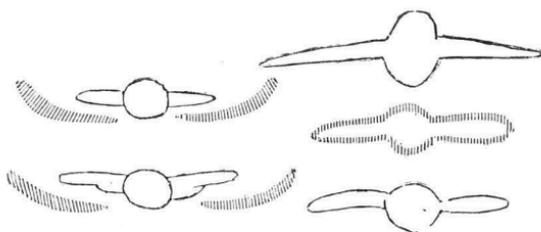


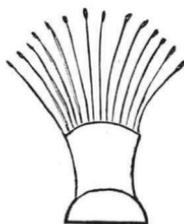
Fig. 20b. Egyptian Sculptures. Fig. 20c. American Mounds.

Fig. 21.



Curved Serpent Mound, America.

Fig. 22a. Egyptian.



Head-dress of the god Nilus. (Denon.)

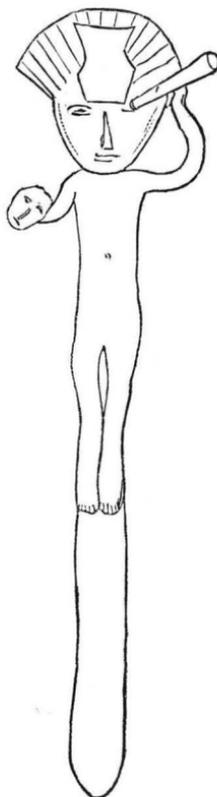


Fig. 22. Ancient American Astronomical Figure in silver, taken from a Chulpa in Bolivia. In one hand a telescope, in the other a mask, probably of the moon. (From *Bolivia and Peru*. By David Forbes, Esq., F.R.S.)

Compare the solar rays on head with head-dress of the god Nilus, from Denon. Fig. 22a.

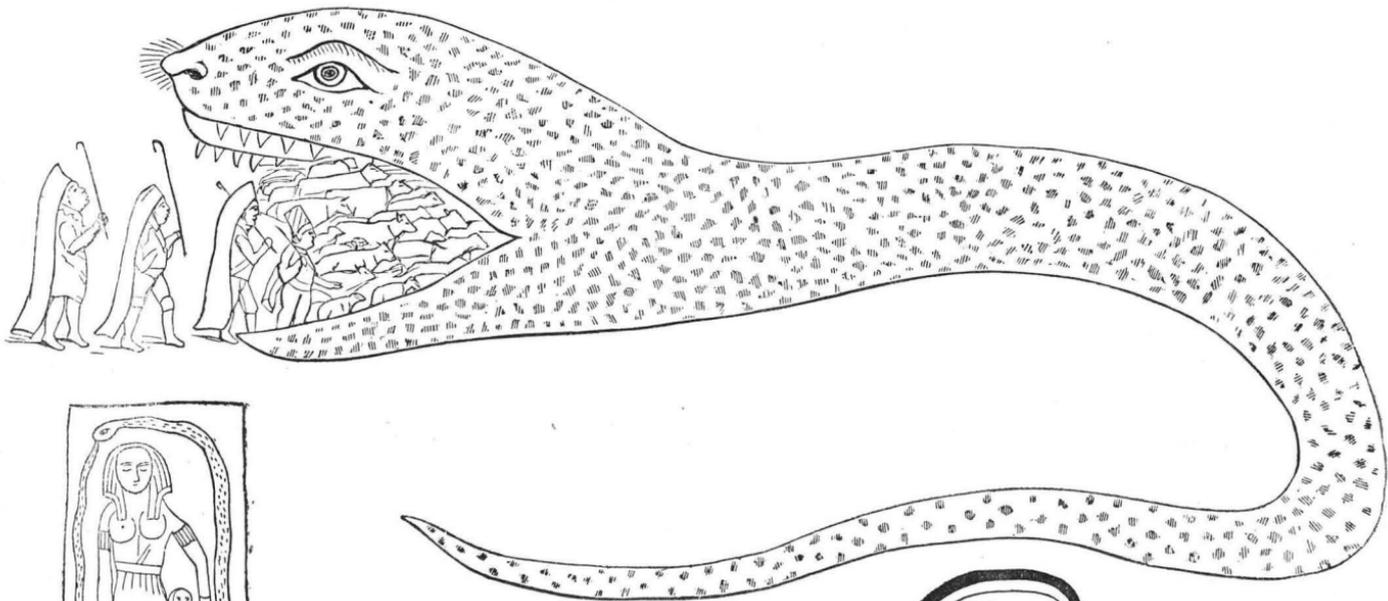


Fig. 23. Avata of Krishna, Indian.

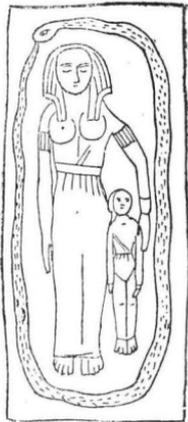


Fig. 24. Egyptian.



Fig. 24a. Egyptian.

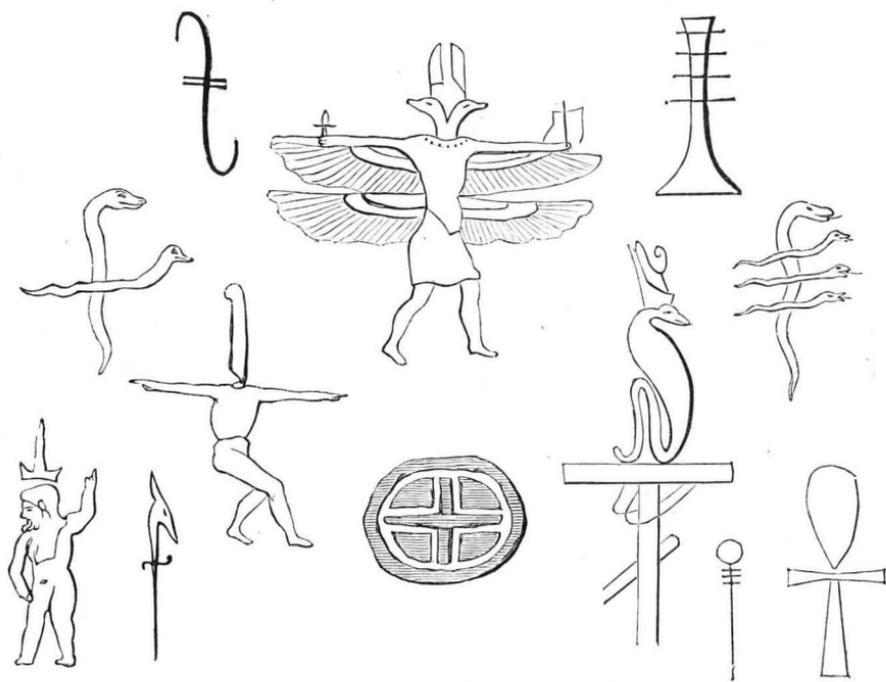
in Assyria, the king of Babylon being represented by Ezekiel as divining *by looking into the liver*. Various authors attribute the same custom to the Druids of Britain, and something very similar was practised in Mexico, and by the Roman augurs, who, it is assumed, also practised this species of aruspicy. Here, at least, we have evidence of a widely-spread custom in different continents associated with death by sacrifice.

25. Impressed in my youth with the remarkable emblems on the Indian temples, I had for many years pursued the study of the symbols of different religions by travel and personal inspection in various countries, and finally devoted several consecutive years to searching the Hebrides, and those remote and secluded districts in the West Highlands of Scotland, in which I felt convinced there ought still to be some remains, beyond mere stone circles and sepulchral tumuli; and I consider, although I have prosecuted the search at a great expenditure of time and cost, I have yet been amply rewarded. The diagrams J, A, B, C, H, Δ, ¶, Y, illustrate several of the remarkable monuments I have discovered, with what appear to me unparalleled results, giving, I think, a further corroboration to the evidence we have in favour of the construction, for religious purposes, of serpent forms and emblems. These diagrams should be compared with G, H, L, I, on which are representations of the American mounds.\* My investigations in the East, and in Greece, Italy, and Spain, were made purely for the satisfaction of my own private desire to know more concerning what appeared to me an interesting subject, but I never deemed the matter one likely to become of public interest in these days, till the valuable work on Serpent Worship by Dr. James Fergusson showed that I was not a solitary student of such forms of religion.

26. There are, moreover, certain other emblems of a very peculiar character, *some of which are markedly identified with the religions to which I have referred*. The cross was evidently one of the very oldest emblems among pre-historic men. I have heard it urged that there is nothing surprising in this, as it is the simplest form of a sign that might be made alike by children and the most uncultivated savages, to indicate any purpose. But it is in the highest positions of veneration, and not in accidental or inferior positions, that it appears. It is

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\* The letters refer to many diagrams exhibited, from which the numbered figures in these pages are a few selections. The reader is referred to *Good Words* and the *Illustrated London News* for figures of some of the Scotch mounds, of the respective dates of March, 1872, and 26th October, 1872; the first being by Miss C. F. Gordon Cumming. Also to a work by the author, *Results of a Recent Investigation into Ancient Monuments and Relics*.



Figs. 25. Egyptian Crosses.

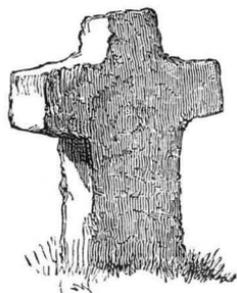


Fig. 26.

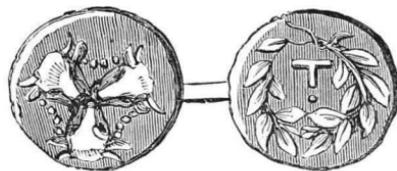


Fig. 27.

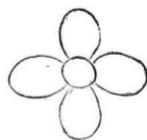


Fig. 29.

one of the most frequent emblems in the temple and tomb sculptures of Egypt (figs. 25, twelve examples); it is found in India (fig. 26); is represented on coins of Phocis, encircled in a laurel crown (fig. 27), with, on the obverse, a trinity of bulls' heads united at the mouths; is one of the most frequent as well as of the most carefully constructed designs of the American mound-builders (figs. 28, 28, 28); is beautifully and elaborately carved in the building, named from this fact "La Cruz," in the ruined city of Palenque, in Mexico, which bears evidence of antiquity long prior to the Aztec supremacy; is known under the form of the letter *tau* (T) as a mark or brand supposed to have been used in pastoral ages to distinguish different flocks; is under that form, *i.e.* a three-membered cross, the actual *mark* directed in Ezekiel to be placed on the *foreheads of those who are to be exempted from slaughter*;\* has been used as a mark placed on those accused of crime but *acquitted*; † was a celebrated emblem of the Phœnicians, and is found on their coins; is also seen in the Assyrian sculptures round the necks of *kings* (fig. 29); and was the peculiar feature in the Tyrian worship, to degrade which Alexander ordered a multitudinous execution by *crucifixion*; while probably the most vast lithic representation of this emblem is to be found in the British isles, as pointed out by me in a paper already referred to as forming part of the inaugural lecture in Sir Peter Coats's Museum at Paisley; namely, the great cross at Callernish (figs. 30, 30a, 30b), in Lews, formed of stones arranged in that shape. We have, then, this emblem also as a marked religious symbol in the four great continents. The *red hand*, moreover, is a most curious emblem of widespread existence, and is still to be found alike in Central America, Mexico, and Ireland. ‡

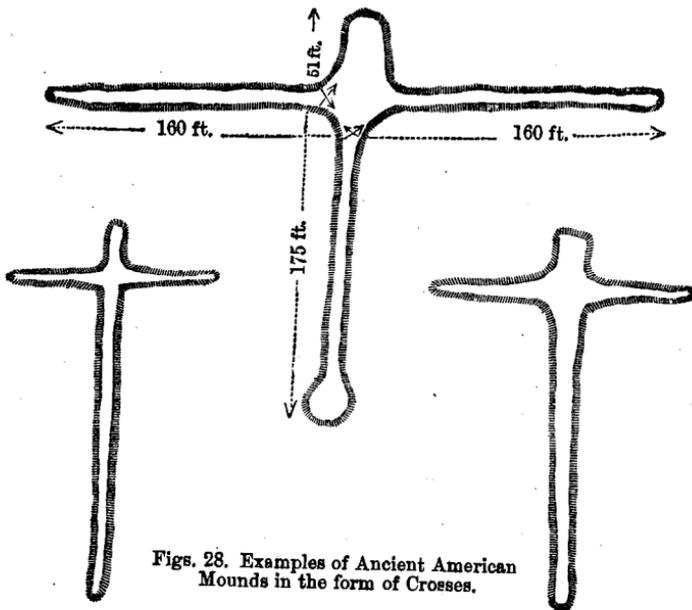
27. In the case of the assumed wanderer, who will be easily recognized, there are two things which would be his distinct accompaniments, *viz.*, a mark upon the *forehead to exempt him from slaughter*, and the recognition of the *red hand*; and we find these two features, *not as marks of disgrace*, but as *most honoured emblems*, in all countries where the sun and the serpent have been worshipped, the *tau*, the mark, and the cross

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\* Vulgate.

† It appears to me also that the habit of marking the caste of a person on the forehead, as in India, is a remnant of this custom; as the person so marked is at once recognized as being entitled to certain privileges, but beyond them he is not entitled. In my youth, in the Madras Presidency, I could identify the status of the natives by this mark of caste.

‡ The red hand is familiarized in our own country by Scott in *Alice Brand*, and by Shakespeare in *Lady Macbeth*, the idea being that the hand of the murderer could not be cleansed from blood.



Figs. 28. Examples of Ancient American Mounds in the form of Crosses.

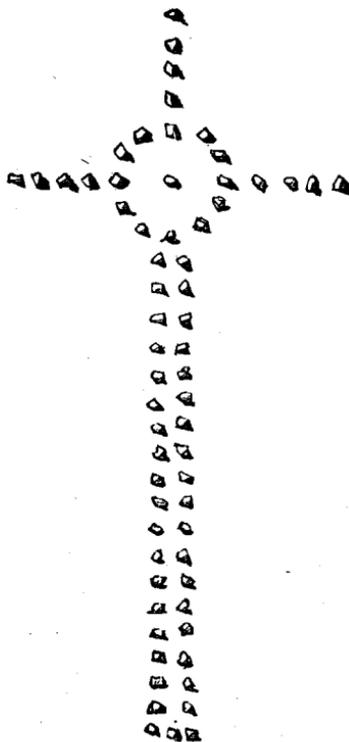


Fig. 30a. Early Celtic.  
Isle of Man and  
Ireland.



Fig. 30b. Early  
Celtic. Brittany.

Fig. 30.—Callernish, Hebrides (380 feet in length).

being synonymous, and the red hand exemplified in religious fratricide, and often also in pictorial illustration.\* But there is yet another distinctive feature in the subject. In early times the great divisions of man were into pastoral and nomad, as distinguished from urban and manufacturing races, and the former were *an abomination* † to the latter. The artificers in brass and iron, and the makers and users of musical instruments, are of very early mention; and though of the same race there are some described as those who dwelled in tents and had cattle, yet there is a special mention of one still earlier, who had flocks.‡ There appears reason for supposing that when this became the distinctive feature of *exclusive occupation*, it was identified as such with the patriarchs, and was looked on with contempt by the rest of mankind, and described as *an abomination*. Now all the nations to which I have alluded as being sun and serpent worshippers, were also the most noted artificers, metallurgists, and miners, the latter either directly or by instigation as purchasers of ores: Egyptians, Phœnicians, Indians, Peruvians, Mexicans. The gold of Peru was so great in quantity that ordinary utensils were made of it; and artificial gardens, the soil of which was granulated gold, and the plants and flowers of which were made of gold, were used as pleasure-grounds § by the Peruvian sovereigns. The Tyrians, Peruvians, and other nations I have referred to, excelled also in the arts of dyeing colours. The Mexicans and mound-builders were miners on so vast a scale, that their richest mines near Lake Superior are, with all the wants and resources of the moderns, only very partially worked now, although abounding in wealth. The Tyrians traded, as Cæsar and others tell us, with the Cassiterides for tin, that is, some of the islands now known as British; while the Indian mines of gold and precious stones, to say nothing of the evidences of immense iron workings, are of note.

28. In conjunction with this is a remarkable statement in the

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\* Indeed, the Phœnicians, according to some authorities, actually had their name from this cause, *φαινός*, blood-red, connected with *φόνος*, murder; hence, *φαινικες* is read by some as equivalent to murderers. Strabo refers to this derivation, though he gives another, but Elsley gives a strong argument in its favour, showing that it would be vainly sought in the Syriac, as it is from *φονίξαι*, ancient Greek for *αιμάξαι*, to slay or murder, and that these people were, in common with the Carians, anciently called by the Greeks *φαινικες*, from their destroying the inhabitants of the coasts in their depredations.

† Gen. xlvi. 34.

‡ Gen. iv. 4.

§ Baldwin's *Ancient America*, p. 250.

first part of the first German edition of Ritter's Geography,\* which gives an Eastern tradition in the form of an inverted history of the enmity between the first two brothers of mankind, setting forth all the circumstances in a party spirit favourable to Cain. The tradition is current amongst the Ishudes, a race occupying a mountain district rich in minerals, and is to the following effect:—That the elder brother acquired wealth by gold and silver mines, but that the younger becoming envious, drove him away, and forced him to take refuge in the East. Moreover, wherever serpent-worship was known, a serpent was in almost every case a guardian of treasure.

29. In the case of the wanderer and fugitive I have assumed, I have taken only purely rational grounds to account for a feature at one time almost universal, even among the most widely dispersed races of the earth. But such grounds will not carry us through the question.

30. However applicable to Egypt's river may be the symbolical serpent, it would not be so to many places where serpent-worship was prevalent. Nor, on the other hand, could that worship have originated in the simple dread of the deadly power of the serpent in countries where serpents are not known to exist, as in Ireland. If the old legend of St. Patrick driving away serpents from Ireland is to be brought in argument against me, it would but strengthen my case, for not only do we find this same tradition attributing to St. Columba the precise counterpart of that miracle in the island of Iona, but in each case it is clear that men addicted to serpent-worship, and not serpents themselves, were the fugitives. I may say that archæological evidence exists to prove the case, as when the serpents, otherwise called devils, were said to have been driven away, they took refuge in Glen Columkil, on the west coast of Donegal, from which, however, they were finally forced. This implies an interval; and that this desolate and remote region was occupied by a strong body of the holders of the ancient Celtic faith is clear from an accumulation of very remarkable dolmens which are there found. The absence of such reptiles in Ireland is remarkable, but their *absence* could certainly not have originated serpent-worship through *terror*, while everything artistic or religious in old Irish designs, from the wonderful illuminations in the Book of Kells to the old Celtic gold ornaments, represents the serpent, and indicates therefore some very strong religious idea being always uppermost in connection with it.

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\* Schlegel's *Philosophy of History*, p. 95.

31. As then neither the rationalistic view of nature-worship, nor the simple dread of the destructive powers of the serpent do more than help us to a very partial explanation of a feature which, as we have seen, hardly ever differed in expression, though at the remotest distances, we must look for some other and more powerful influence as the originating cause. To arrive at this it will be necessary to recapitulate the points of agreement at the greatest geographical distances; viz., a common worship of the sun and serpent, either as distinct deities or a compound one, together with the principal symbols attending them,—fire and the cross, the association of fratricide or human sacrifice with this worship, and that too for propitiation, and the widely distinct customs of the two first sections of the human family by the desire to acquire wealth, through the production and traffic in metals, and the opposite of exclusively pastoral life. Now in the earliest times, when there was little or nothing to distract man's attention, and when his ideas must necessarily have been few, it appears to me there is only one way to account for a common custom at the remotest geographical positions, which is, by a common tradition. Facts that had occurred would be known and handed down, and if not palatable to any, there might be evidences of perversion; but in those times there could never have been a total forgetfulness, nor, on the other hand, a wholly original and pure invention, for there was no experience on which to frame it.\*

32. Moreover, if we should find in one and the same tradition at least the three prominent and universal features referred to,—fire in connection with worship, human sacrifice of blood kindred, and the admitted need of reconciliation with an estranged and powerful deity; still further, if these are found in conjunction with like symbols and occupation, and even a corroboration, by the presence of other traditions having affinity with that one, though at wide-spread distances, we should certainly have strong reasons for attributing the customs to the tradition, by considering *that* tradition was once universal, and that, however remotely found, it had there been carried.

33. If in addition we should find that this tradition was retained by the descendants of those who had, as it appears, not even moved from their central geographical position, but who retained

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\* The Indian traditions, as mentioned further on, are so puerile that they not only betray a most contemptible endeavour at invention, but also show that they were of a much later date, when at least the utility of the sugar-cane was understood, and wine and clarified butter in use. If nothing better could be thought of then, by way of invention, it shows a difficulty that would increase the further we go back.

in common with it all the primitive features of the race to whom the tradition first applies, we have, I think, a still stronger ground to go upon.

34. Before coming finally to this, let us see if there are any evidences of other traditions, or customs indicative of traditions which, if this were the cause, must have gone hand in hand with it.

35. Tree-worship, on which I cannot enlarge, appears to have been a widespread custom, which, it must be admitted, is strongly corroborative.

36. Some of the ceremonies of the Mosaic ritual have so peculiar a tendency, that a few questioners have, on superficial examination, mistaken them as indicating a species of solar or Sabian worship. The emphatic denunciations against such worship show that this could not have been so, and yet the question arises, why did they assimilate?

37. It must be borne in mind that the Israelites had all the tendencies and failings of mankind in general, and that they saw everywhere around them the worship of visible gods or their symbols. The historical account shows how great the difficulty was which Moses had to encounter in their case, and how soon the pure worship, restored through his agency, again became adulterated. It would have been simply impossible to have confined these people to the worship of a pure and invisible deity, such as their forefathers the patriarchs worshipped, with their antecedent knowledge of Egypt's gods, and with the acquaintance they were yet to make with the Baal-worship of Canaan; for which reason it is not improbable that to satisfy the remarkable tendency of human nature for something tangible in worship, rites externally somewhat similar were adopted, and even in some cases likeness-symbols,\* as instanced by the brazen serpent, when obedience, even to promote their own cure, could be wrung from them in no other way, while the only really miraculous emblem in the hands of man that could be associated with tree-worship was to be found in Aaron's rod, which budded. Amongst the rites we find some that might *per se* be taken for evidence of solar worship, as by the undiscerning nations of Canaan the brazen serpent probably was, of serpent-worship, and to which adoration was finally paid by the Israelites themselves, no doubt in conformity with surrounding customs.†

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\* Thus, Acts vii. 44, the tabernacle is called the tabernacle of witness, and is evidently referred to as in opposition to the tabernacle of Moloch in the 43rd verse.

† A small tribe in India, claiming descent from some shipwrecked refugees of the tribe of Reuben, cast on the coast of Bombay, and called Beni-Israel, have, it is asserted, to this day, "each in his secret chamber, a

38. Indeed, fire seems to have been inseparable from the worship of Jehovah, an appearance He himself assumed in his first communication with Moses. The first acceptable sacrifice was a burnt-offering brought with all devotion, not, I think, as an experiment but with a knowledge (by communication)\* of its acceptability; and neither from the minds of pure worshippers, or the opposite side, could this fact have been eradicated, as it was indelibly impressed on all future people by its accompaniment; viz., the *FIRST* human sacrifice to that god in man's breast—self-esteem, whose attributes are jealousy and revenge. It is probable then that fire was the *first* agent used in the external rites instituted by Jehovah himself; hence the readiness with which the secessionists would have adopted its actual worship in lieu of the Deity, with a false clinging to the persuasion that their rites were still acceptable to Him through this means; nay, in the first instance might have been sincerely and sorrowfully adopted from the expression, "My punishment is greater than I can bear;" "From Thy face shall I be hid," an acknowledgment that the Deity who was being deserted was benign and kind, and that that Deity could not have been the sun, from whose light no escape was possible, and which could by no stretch of imagination have been represented as pleading and striving with individuals by separate acts. How indelibly the events of the first operation of sacrifice by the sons of men was impressed on the minds of subsequent generations all over the globe, is seen from the amalgamation in their rites of ALL THE EVENTS that formed that *first* great drama, by their substituting their *nearest relatives*, instead of a lamb, for the *burnt-offering*, for the purpose of *appeasing an offended deity*.

39. Moreover, the two ceremonies of human and brute sacrifice carry conviction with them of their institutors; thus not only was a mere animal a simple offering, as a creature the life of which was reasonably taken, but we find that it was under certain circumstances not even wasted, as in the peace-offerings, but after a sufficient ceremonial, to prove its dedication, was to be used as food by the giver and the officiator; whereas, apart from the homicide, the destruction of the nobler creature, especially of the purest and most innocent, as of children, was one of unmeaning cruelty and objectless annihilation. I purposely abstain in a paper of this description from introducing the more

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silver serpent, to which they burn incense twice a day, and throw a little flower (?) before it, and sing, accompanied with a small tom-tom." (J. Wilson.)

\* One object of which, it appears to me, may have been to impress on man a custom, which, in the matter of food, was to divide him from the brutes; viz., that to eat raw flesh was an act of unsanctity.

solemn and mystical sacrifices, and the meaning involved in them, but it is impossible to close one's eyes to the great fact that even the deification of such an ancestor as I have portrayed, and *the holding his acts as sacred and worthy of imitation*, could only have led to the authorization of human sacrifice when the victim was an enemy or rival, real or *supposed*; and that the institution of the propitiatory sacrifice by parents of their own children \* is almost absolute proof of a tradition, from the very first, of the amelioration of the condition of the human race, and the reconciliation with an offended deity by some such process. May we suggest on their parts a voluntary offer of submission to the author of that flaming sword—which, whatever may be the meaning of the expression, would after a time be taken literally—which was said to intervene between them and immortal life. Hence those so devoted to the gods were deemed supremely blest, as having passed that barrier. This idea was forcibly portrayed by the Egyptians, who represented Paradise as surrounded by streams of fire, issuing from the mouths of sacred uræi (*i.e. seraphs*, fiery serpents), one of which guarded each corner; the fire so breathed out being intended, as Mr. W. R. Cooper informs us, to destroy any invading or unjustified soul.

40. The fundamental question of reconciliation is not within the scope of this paper, though it materially aids the conclusion. I will therefore confine myself to less important but still very interesting customs practised in common by the Hebrews and idolatrous and pagan nations.

41. Fire was an emblem of the Deity with both; the seven Spirits of God were also so represented, and the branched candlestick was an emblem. We are told likewise of the fire that was to be kept burning the whole night, † *i. e. during* the time the sun was invisible, a specification quite distinct from that for its perpetual burning. On the pagan side we find in all countries, including Britain, that not only was fire to be kept perpetually burning, but that in some it was to be each year miraculously renewed: the hearth-fires were extinguished in Britain on one particular night, only to be rekindled ‡ with the sacred fire given out by the priests, a custom still kept up in Jerusalem by means of lighting tapers, and still observed amongst the Guebres of India and Persia. §

\* The seed of the woman. We lose an immense deal of force by the introduction of the word *δία* in the Septuagint, and its equivalents in the Vulgate, and the English translations of Eve's expression on the birth of Cain. Here we must go back to the Hebrew קניתי איש את-יְהוָה (*i.e.*) I have gained a man the Jehovah; proving that so deeply impressed upon the mind of Eve was the promised reconciliation, that she concluded, immediately on the birth of a son, that the agent of reconciliation had arrived.

† Lev. vi. 9.

‡ Godfrey Higgins, p. 158.

§ Dr. Hyde and others.

42. But in my investigations in Scotland I have lately discovered, in Ayrshire, a monument which appears to combine the most important customs I have touched on in one. Diagrams  $\Delta$ ,  $\gamma$  represent the form of a mound with a large circular head,\* and a serpentine ridge 400 feet long (figs. 32 and 33). It appears, though in a different attitude to the serpent mound in Argyllshire,† still to bear the characteristics of a serpent emblem. Attracted by the outline, I excavated the mound, and discovered a paved platform of great interest. The hill is 100 feet high on its western side, is most uniformly shaped, and on the north and south sides measures 60 feet high; to the east it is only 40 feet, and here its true circular form is lost, and a distinct elongation, terminated in broken ground, occurs just over a roadway formed at no very remote date. On the other side of this roadway similar broken ground appears, where a beautifully curved serpentine embankment, 300 feet long commences. It is evident that the embankment once joined the circular mound or head, and was severed when the road was made. The embankment forms a ridge about five feet across on the top, and was once nearly 400 feet long; it tapers as it recedes from the head, and also slopes downwards towards the end or tail, terminating almost vertically, the earth having been retained in position by a facing of uncemented stonework, the remains of which still preserve the shape. The ridge, which runs sinuously from the east side of the mound northwards, has been formed on the crest of a lofty bank, and is at an elevation of 130 feet above a stream still further north. The serpentine ridge did not contain any relics, but on cutting through it, its artificial formation was plainly shown, the materials having been brought from the adjacent sea-shore, and being quite distinct from the original summit, which was clearly defined. Trenches were cut in the head or circular hill at the four cardinal points, from the summit to the base, without any result; but on continuing these over the plateau, so as to form a cross, a divergence had to be made to avoid some trees, when the soil, hitherto of light colour, suddenly changed to black. This discoloration being followed, a paved platform was found about two feet, in some places, under a rich vegetable soil, which covered the whole hill uniformly (except where it had been severed from the embankment), and which it must have taken ages to deposit; the trees that have been for many years on the hillock assisting little, as they are

\* The ridge and head are now severed by a modern roadway.

† For further particulars of these mounds see the author's papers in Reports of the British Association for 1870-71-72-73, and Proceedings of the Royal Institute of British Architects, 19th May, 1873.

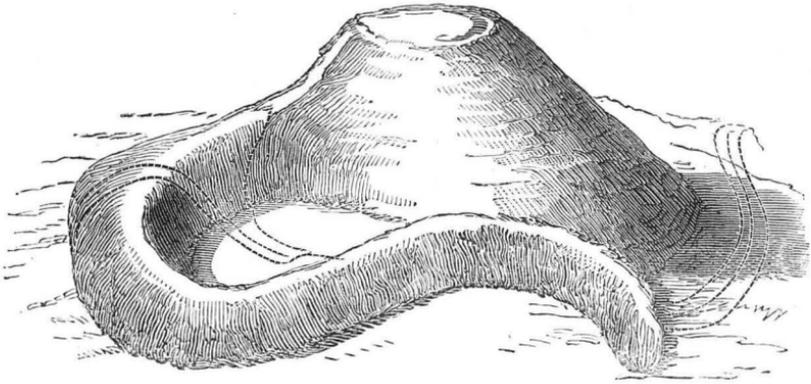


Fig. 32. Elevation of Mound. On the Clyde.

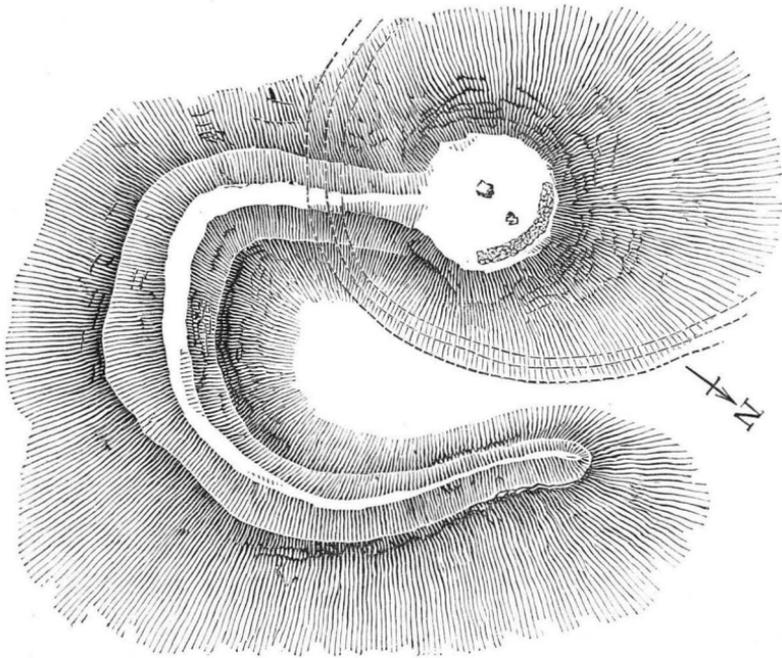


Fig. 33. Plan of Mound

coniferæ. This discovery took place at the north-east, and was on the verge, just where the plateau joined the declivity. Cuttings were then made at intervals of a few feet all round the edge, in the same position, without success, till, on arriving at the north-west, the same appearance was exhibited. In result it was found that the platform was 80 feet long and 5 feet wide, paved with smooth flattened stones from the shore in a true curve, forming a segment of a circle, and covering a space between and including the north-east and north-west points of the compass (fig. 34). The platform itself, and the earth beneath it to a considerable depth, were highly charred, large masses of charcoal filled the interstices between the stones, and on washing the earth obtained from the same position, it was found to be full of portions of bone, so reduced in size as to show that the cremation must have been most complete. Taking the latitude of the mound, and the points of the compass where the sun would rise and set on the longest day, this segment-shaped platform, devoted apparently to sacrifice by fire, is found to fill up the remaining interval, and thereby complete the fiery circle of the sun's course, which would be deficient by that space. Near the centre of this hillock was found under the surface a much larger stone than any on the hill, and which may have formed part of the foundation of an altar. Independently of the time of year indicated by this fire agreeing with that of the midsummer fires of the Druids, we have here not only apparently an evidence of solar and serpent worship, but also of sacrifice. In Scotland also fire in connection with the cross was the signal for blood-shedding.\*

43. Observe then,—with the Hebrews was the custom of keeping fire burning nocturnally, *from sunset to sunrise*, and this in connection with sacrifice; in the monument before us appears the same custom on a magnificent scale, viz., for a particular occasion the burning seems to have been so arranged as even to fill up the arc of the sun's disappearance from *the point of his setting to his rising again*, completing, as it were, the circle of his light and heat.

44. But let us look for one moment at another wide-spread class of traditions;—time will only permit me to give one illustration.

We find amongst the books of the ancient Americans one in

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\* The symbol which summoned to arms.—Scott. Since reading this paper I have, through a suggestion by Mr. Wm. Simpson, discovered west of Bute a vast lithic temple (hitherto unrecorded) arranged in a serpentine form, with a cross transept, and having along its course evidences of interment; and on the Mendip Hills beautifully *serpentine* arrangements of barrows, evidently connected with the great religious places of the Celts.

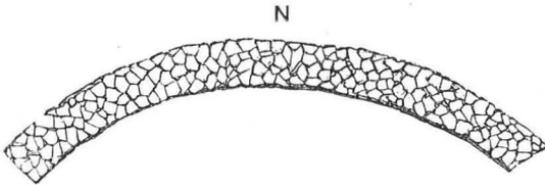


Fig. 34. Plan of Platform, 80 feet by 5 feet.

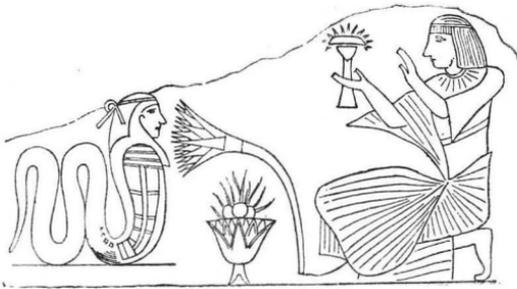


Fig. 35.

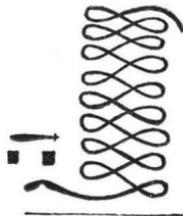


Fig. 36.

the Quiché language, called the "Popol-Vuh," and in it a tradition of the Creation, as corroborative to my mind of its descent from the original history of the world, which we read of in our Bible, as corroborative, I repeat, in short, as the Assyrian account of the Deluge is of there being a current international tradition of that event, and not simply a Hebrew one. Mr. Baldwin gives the particulars of the Creation from the "Popol-Vuh," as follows:—

"According to the 'Popol-Vuh,' the world had a beginning. There was a time when it did not exist. Only 'Heaven' existed, below which all space was empty, silent, unchanging solitude. Nothing existed there, neither man, nor animal, nor earth, nor tree. Then appeared a vast expanse of water, on which divine beings moved in brightness. THEY SAID 'Earth,' and instantly mountains rose above the waters like (hard\* fish), and were made. Thus was the earth created by the Heart of Heaven." Next came the creation of animals; but the gods were disappointed, because the animals could neither tell their names, nor worship the Heart of Heaven.

45. Therefore it was resolved that man should be created. First man was made of earth; but his flesh had no cohesion; he was inert, could not turn his head, and had no mind, although he could speak; therefore he was consumed in the water. Next men were made of wood, and these multiplied; but they had neither heart nor intellect, and could not worship, and so they withered up and disappeared in the waters. A third attempt followed: man was made of a tree called tzité, and woman of the pith of a reed; but these failed to think, speak, or worship, and were destroyed, all save a remnant, which still exists as a race of small monkeys in forests.†

46. A fourth attempt to create the human race was successful, but the circumstances attending this creation are veiled in mystery. It took place before the beginning of dawn, when neither sun nor moon had risen, and was a wonder-work of the Heart of Heaven. Four men were created; and they could reason, speak, and see in such a manner, as to know all things at once. They worshipped the Creator with thanks for existence; but the gods, dismayed and scared, breathed clouds on their eyes to limit their vision, and cause them to be men, and

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\* I have used the expression "hard fish" here, as that which is nearest to the meaning; the simile is clearly an invention. In the original they are described as "like lobsters"; but just as κῆρος means large fish as well as whale, and as the Romans used "Bos" for any large undescribed animal, it is plain the lobster is in this case merely selected from its hard crust.

† Here becomes evident the invention of the restorer; it is open to immediate detection, being as childish as that which distinguishes the Puranas.

*not gods.\** Afterwards, while the four *men were asleep*, the gods made for them beautiful wives, and from these came all the tribes and families of the earth.

47. Here we have the same tradition as ours, with the evident loss by time of some of the consecutive events. It is not a created fable, or it would abound in the marvellous, as we find is the case in Oriental cosmogonies, while the excessive paucity of material, as in the several oceans of salt water, sugar-cane juice, wines, clarified butter, curds, milk, &c., described in the Puranas, shows how difficult it was in early times to *invent* a tradition. Nor could two such similar accounts originate in those primitive days spontaneously when theses were unknown; whereas it contains all the panels of the picture—if I may so express it—but some of the portraits so faded, that the restorer, not knowing how to replace them, simply kept repeating the principal event in the blank spaces, and at each step of distance showed a stage of less perfection than the complete one.† But we have our *six* panels intact; we have the exact description of events before the present condition of the earth, a precise counterpart of that in Genesis, consonant with the plural Elohim, and the Spirit of God moving on the face of the waters, and which, together with the brevity and power of the expression “they said,” is emphatic. Our third and sixth pictures, of the appearance of the earth, and the creation of man, are perfect. As to the four men created, this is clearly confusion between the creation of man and the four men reputed to have peopled the earth after the Deluge, thereby giving us a combination, and so far a corroboration of the universality of *more than one* tradition still retained amongst us.

48. In fine, then, I can but attribute these universal customs to a like universality of such traditions, as you will already have recognized; and see, in the worship of the sun, a transmission of the very oldest traditions found in our own, *i. e.* the Hebrew records.‡ Thus fire, the symbol of sun-worship, is represented

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\* “Man is become as one of us.”

† To this may be added that the Persian tradition of the creation, in their oldest language, gives also six periods or stages of creation, and that man is represented as the being created on the sixth day.

‡ While it is clear that the Hebrews were the descendants of those who held the earliest, as well as the purest traditions and customs which they solemnly revered and practised, it is manifest that these were transmitted orally, and not reduced to a written formula till the time of Moses. Still, an author of deep research asserts that Bin Washih had collected a great variety of alphabets, and even some which he supposed to be “antediluvian.” We know not what was lost by the destruction of the Alexandrian library, but it is remarkable that the cuneiform and other inscriptions, which we have now access to, deal largely with the subject of the Flood, and this style

as the *first* sign of the offended Deity in the *flaming* sword, as acceptable with the first offering,—that is, the first recorded sacrifice,—and afterwards falsely substituted for the offering itself. Human sacrifice, specially by fire, and by the nearest relatives, as commemorating the first *homicide and fratricide through a quarrel, the subject of which was an offering by fire*; and also, in its *propitiatory* form, as appeasing the anger indicated by the fiery sword, and illustrative of an endeavour to realize an event which, through such means—the suffering of the seed of the woman—should produce a reconciliation, as evidently promised.

49. In the worship of the serpent I recognize an acknowledgment of his power, and of the tradition of the obedience rendered him by the *first* parents of mankind. In human sacrifices to him, there is a recognition of the great traditional sacrifice of felicity, in the intercourse with Deity, made by the human race through *first* following his counsels, and also of the introduction of the death of man; as well as a desire to propitiate him for any anger he might entertain, arising from a worship of the visible symbol of the Deity; and in the joint worship of the sun and the serpent I observe another record of that drama in the final act of which the spiritual powers of good and evil were both represented as visibly present. In the worship of a good and bad serpent-power I recognize the confusion arising from the amalgamation of the sun and serpent as a combined deity, the benign influence of the sun, and the malific power of the serpent; but more particularly—and this brings us to the primal origin—from the knowledge promised by the serpent, as the result of obeying his counsels, the *knowledge of good and evil*, a title also given to the tree eaten of; hence the prevalence of *tree* and *serpent* worship, and the proof of the wide-spread tradition of the *Fall*. It is a very remarkable fact, that whereas tree and serpent worship are generally described together, in Nineveh it is the sun emblem, which I have before described as Asshur, that is, the sacred symbol raised above *the tree* (fig. 31c); thus giving us the combined emblems of good and evil with tree-worship also. See diagram, which contains also a serpent altar and a tree altar

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of writing dates back to a very remote period; and there is no reason why it should not have been used even before the Noachian Deluge. The recent extraordinary revelations upon the Creation and the Fall, from the clay tablets of Kouyunjik, as read by Dr. George Smith, may lead to a conclusion on this subject; and while it is reasonable to suppose that Moses was the first compiler for the Hebrews, may prove beyond question that the traditions so sacred to us were not new to him, but internationally acknowledged as the true accounts of those great events, even long before his time.



Fig. 31.

Trajan burning incense to Diana. Both the Goddess and one of her emblems, the boar's head, appearing in the sacred tree above the altar.

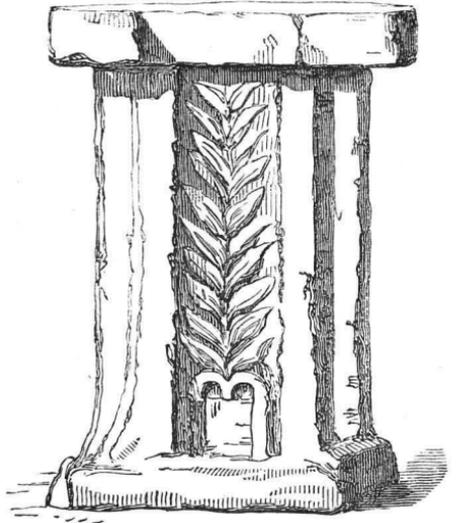


Fig. 31a. Tree Altar from Malta.

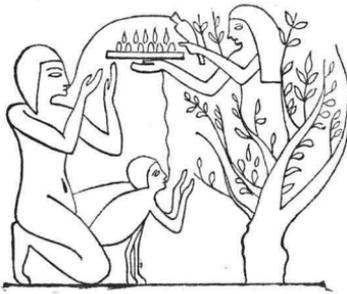


Fig. 31b.

Tree-worship, Egypt. The Goddess Nu, in the sacred Sycamore-tree.



Fig. 31c.

Tree-worship, Assyria. Presence of Asshur.



Fig. 31d.

Tree-worship, India.

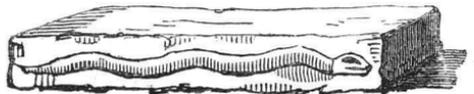


Fig. 31e. Serpent Altar from Malta.

from Malta, *ibid.*, and two serpents worshipping fruit (Pompeian), which fruit agrees exactly with the offering to the Assyrian Asshur, and with the fruit of the sacred tree embroidered on the dresses of the kings of Nineveh. Figs. 31 to 31e.

50. The tradition of the Fall is evidently portrayed in the Mexican narrative through the records of its principal event, described as the *gods*, in fear of man's power, breathing a cloud upon the eyes of men; evidently the tradition of the obstacle put to the power of attaining to the Tree of Life. The words are almost identical with the Hebrew original: "Man is become as one of *us* to know good and evil"; but even here bearing evidence of a remarkable perversion, like the inverted story of Cain and Abel already mentioned; for here it is man that was *good*, and "worshipped the Creator with thanks for existence," and the gods who, *without provocation*, breathed clouds on his eyes to limit his vision.

51. It will be readily seen by those acquainted with the subject, that I could have introduced many points which seem even more nearly to approach to an explanation of some of the questions I have endeavoured to answer, such as Indian, Grecian, Persian, and American traditions of a superior being wounding the serpent's head, and the serpent either wounding or biting off his foot, as in the account of Crishna (*e. g.*); or of the cry of "eve" or "eva" by the celebrants of the mysteries, while they held living serpents in their hands, and others; but, in the limits of a single paper, I have deemed it better to break new ground, and to confine myself to the simplest evidences that the case admits in connection with nature-worship.

The CHAIRMAN.—I am sure the meeting must be perfectly unanimous in voting its thanks to Dr. Phené for his interesting paper. The Honorary Secretary has to read two communications, after which it will be open for any present to offer remarks thereon.

The HON. SECRETARY.—Two letters upon the subject before us have been received—one from Professor C. Piazza Smyth, who, having read a proof copy of Dr. Phené's paper, "takes exception to the way in which Mr. Phené introduces his subject, and also to the statement that fires ever burned at the top of the pyramids," adding that "the sides of the Great Pyramid were originally steep, sloping planes, and its top, a sharp-pointed apex." The other is from the Rev. Canon Titcomb, "taking exception to the statement that the pyramids were built to supply the place of mountains."—I may say that General Crawford, who has lately returned from Egypt, states that the hills in the neighbourhood are about 800 feet high.—Canon Titcomb adds, "With regard to serpent-worship being one of the dangers to which the Israelites were exposed when first coming in contact with the Phœnician or Canaanitish race, surely there is other evidence of it than that adduced in referring to the brazen serpent (the circumstances in regard

to which are explained on other grounds). The Phœnicians certainly worshipped the serpent under the name of Ob or Aub, and it is interesting to note the express allusion in Lev. xx. 27. 'A man also or woman that hath Ob (or Aub) . . . . shall surely be put to death.'

Mr. J. F. WADMORE.—I hope I may be permitted to say a few words upon the subject before us this evening, as I am a student in the same direction as Dr. Phené. I think we all owe our thanks to Dr. Phené for his indefatigable labours. Nobody can be better aware than I am of the great expense, both of time and money, which is required to find out the many facts that are necessary to build up such a theory as his. We certainly read of an altar of stone in Scripture, and that no tool was to be used upon it (Exod. xx. 25), and in Stonehenge we find large masses of stone upon which no tool appears to have been used. There are several places that might have been brought in and cited as examples. I think that, looking at Avery, it was to some extent a temple, not in the mound form, it is true, yet, not without a mound within a distance of barely one mile, and from the rugged masses which compose the Druidical circle, one is disposed to believe that it was a hypethral temple, much anterior to that of Stonehenge; it stands in an enclosure fortified with a mound and fosse, and formed, no doubt, one of those sacred oppida alluded to by Tacitus, where the Druidical mysteries were taught and handed down to kindred worshippers of the sun and serpent; for, stretching away from the oppida both in a S.E. and S.W. direction, are still to be seen the remains of a row of stones, traditionally an avenue, leading to the banks of the West Kennet, on the one side, and the village of Beckhampton on the other, between which lies the colossal mound of Silbury, covering an area of not less than five acres and a half of land. Sir Richard Colt-Hoare calls it The Hill of Assembly; whatever it was, we find it here connected with a traditional Druidical temple and its serpentine avenue of stone. I have been led to this idea by looking at the general conformation of such places, with their camps and mounds and hill forts, all over the neighbourhood. There is another similarity in the hill fort at Cisbury, where you get a vandyke running up to it in a peculiar sinuous, snake-like form. In the same way, at Marden, we get a peculiar form of works and mounds, we get three forms of the latter, one of which they used for tumuli, and some of these are very large indeed. But Dr. Phené has illustrated all the three classes. Then there are others, equally large, important, and interesting, and they have evidently been used as prehistoric citadels: of course, they have lost something of their original character, but they still retain sufficient of their form to show what they were. There are many examples in existing castles and citadels which bear out the idea, as at Windsor, Warwick, and Arundel, and other places. In many of these mounds there have been found coins, flints, pottery, and all sorts of things, which bear out the theory that the mounds and earthworks date far back into our history; and Mr. John Evans has recently published a work which shows that the early civilization of Britain was by no means inconsiderable; it appears from him, that there was a

gold coinage in Britain at least 300 years before the Romans landed ; and they could produce gold coins, they could possibly construct other and better forts and citadels than many of these rude mounds. That in Ayrshire is very finished, but we have others which are much more rude. Some of the oppida were turned into Roman camps, as was the case at Silchester and Verulam, which were originally British citadels, afterwards occupied by the Romans. After the time of Boadicea, when instructions were given by Claudius that all the British forts should be occupied by Roman detachments, we find British and Roman remains lying in juxtaposition. The whole subject is too large to be treated too exclusively from one point of view, but it is extremely interesting.

Rev. G. W. WELDON.—I have great pleasure in adding my testimony to the value of Dr. Phené's paper (containing, as it does, the results of considerable investigation, for which we ought all to feel much obliged to him). I have often found myself following him in his travels ; wherever I went Dr. Phené had been there before me ; I even found his name entered in the visitors' book in Wisconsin, at Milwaukee, in America. There are many things mentioned by Dr. Phené which in themselves are mere nothings, but when taken together, there can be no doubt as to their connection with each other, and as to the proof they afford of sun and serpent worship as a universal fact throughout the world. I agree with Dr. Phené, in the second paragraph of his paper, as to the feeling in the human heart. There is no doubt whatever that there are three facts with regard to man which are of universal application : first, that man is a religious being ; secondly, that he will and must worship something ; and thirdly, that he becomes associated more or less with the objects of his worship. In this way you may account for the difference which existed between the worship of the Greeks and the worship of the Arabs. The Arabs led a wild, nomadic life ; they saw neither rivers, groves, nor mountains, but they did see the sun, moon, and stars, and would naturally worship them. In Greece they had groves, rivers, and mountains, and they would naturally worship these things as objects around them,—having no revelation, they would fall back upon nature. The Greeks not only worshipped the groves, but the trees in the groves, every tree having its dryad or hamadryad, whose life was coincident with that of the tree. As to the serpent, we know it occupies a conspicuous place in the pages of the Old Testament history, and the tradition has been scattered far and wide throughout the world. There is one thing of which I am certain, that there is a universal feeling of dread with regard to anything that creeps in a serpent-like manner. Dr. Phené must himself have been cognizant of this fact, that in the north-west of Scotland, during the time of the famine, none of the people could be induced to eat an eel. They were plentiful enough, and I remember asking a man to take one home, but the reply was "Not for me." (Laughter.) The simple fact is, that there is a superstition attaching to these creeping things. With regard to the brazen serpent, we should recollect that in the human mind there has

always been a feeling that there was some sympathy between the weapon and the wound. Sir Kenelm Digby, one of the most distinguished surgeons of his time, and who was far in advance of his own day, used to bandage, not the wounded limb, but the weapon that had inflicted the wound; and the superstition of the wounded man's mind associated his cure with the unwinding of the bandages from the weapon. In the same way, with the brazen serpent. What inflicted the wound? Fiery serpents. What cured it? The brazen serpent. There you have the sympathy between the weapon and the wound. I do not quite agree with Dr. Phené's reference to the flaming sword. I think that fire-worship is a lingering of a lost tradition of the symbol of Jehovah's presence in the various parts of the history of the Old Testament, as when Moses came down from the rock, when his face shone, and, above all, when the fiery tongues appeared upon the day of Pentecost. With regard to the question raised in the case of the Africans and South Africans, serpent-worship and devil-worship go together. The Krooman says: "I do not want to propitiate the Good Being, for He is always good. But the 'bad being' is always bad, and I want to give him gifts to make him good." That is an argument which has been more or less adopted in various parts of the world. The serpent spoken of in the Scripture is that old serpent the devil, and you have that most remarkable illustration, to which Dr. Phené referred in the case of Krishna, which bears out the third chapter of Genesis in a most wonderful manner. In that representation of Krishna, you have a superior being whose heel is being literally and truly wounded by a serpent, and the being herself is inflicting a mortal wound on the reptile. The whole subject is most interesting; and it is important to gather together these disjointed fragments of lost traditions, and to bring back to our minds this great fact—that God sent man forth not without the truth, but man himself broke up that truth into a variety of fragments, each nation using them as it thought fit. I trust that Dr. Phené will enter more fully into the subject upon another occasion.

Mr. S. D. WADDY, Q.C., M.P.—I think our thanks are due to Dr. Phené for his patient accumulation of facts, which is a far more valuable contribution to our knowledge than merely setting up a theory. We have all felt that we wanted more facts upon this subject. I do not quite agree with all that Dr. Phené has said, but I go with him very far. For instance, with regard to the serpent and sun worship; so far from thinking them identical or related, I think they come from two entirely different quarters, and represent entirely antagonistic ideas and principles. When man began to abandon the worship of the true God, he began also by degrees to worship two distinct beings—a good one and a bad one. The spirit of instinctive adoration in him led him still to worship the good Jehovah, the Supreme Being; but, inasmuch as mere terror in the human mind influenced it, sometimes more powerfully even than the feeling of adoration and reverence, so, by degrees, man got to worship that which was to him the source of all evil and sorrow. But in either case, whether he worshipped the good or the evil spirit, he wished to worship by the help of some symbol. The more striking the

symbol, the more easy faith became. Therefore, when a man wanted to worship God, he looked up for that which was most like God according to his notions. That which gave him the best and clearest idea of beneficence and majesty was the sun, and this, therefore, he accordingly worshipped as the representative of God, not with the idea of its being taken as God, but solely as a symbol of His majesty, power, and beneficence. By degrees—and this is the history of all idolatry—the symbol displaced in the mind of the worshipper that which it was intended to symbolize, and became itself the object of worship. The first reference we have in the Scripture to idolatry of any kind is that passage in Job : “ If I beheld the sun when it shined, or the moon walking in brightness, and my heart hath been secretly enticed, or my mouth hath kissed my hand, this also were an iniquity to be punished by the Judge, for I should have denied the God that is above.” (Job xxxi. 26, *et seq.*) Accepting the chronology of the best authorities with regard to the antiquity of the Book of Job, this is the earliest reference to idolatry of any sort, and there is no reason to believe that, at the time that passage was written, any form of idolatry existed, other than the worship of the heavenly bodies. And this form of idolatry, which has been generally known as Sabianism, was in its symbolic form, as I believe was the idolatry of the Hebrew ; for I do not believe their idolatry ever became so gross and sensuous a thing as that of the heathen now is. Down to the latest time it was, in fact, the professed adoration of the symbol of Jehovah : we have a strong instance of this in the setting up of the images in Dan ; for Micah, who had put them up, congratulated himself that he had got a Levite for his priest, for he said : “ Now know I that the Lord (*Jehovah*) will do me good, seeing I have a Levite to my priest.” (Judges xvii. 13.) You have here clear idolatry, and yet, at the same time, there is in that idolatry clear and distinct reference to Jehovah, and to His worship alone. But having once introduced into worship the powers of nature, by degrees they themselves came to be worshipped as evil and good, until we come at length to that pagan worship of the Greeks of which Mr. Weldon spoke, when a naiad dwelt in every stream and a dryad swung on almost every bough. With regard to devil-worship, perhaps the best illustration is that of some of the African tribes, who worship the serpent alone. That is devil-worship, and from the earliest times serpent-worship has been simply and purely the worship of the Evil One. When men had worshipped God from pure motives, as one who was wise, beneficent, and divine, then, by way of placating the other deities or powers, they tried to find an emblem of that which was evil. And no greater triumph over our lost race could have been desired by the devil himself than that they should have knelt down and selected for their worship that very serpent which, in the earliest history of our race, was connected with its fall from innocence and purity. A symbol was wanted,—what should they get ? We can well understand the selection of the sun as an emblem of good, but is it possible to find anything as a proper symbol of the devil, unless you connect the serpent with that one single instance in which the devil is known by Divine history,

and was remembered by vague traditions in all nations, to have been brought into visible and actual connection with man? I thank Dr. Phené very much for the collection of interesting facts which he has put before us.

Dr. PHENÉ.—I am greatly obliged for the kindly way in which you have received my paper. I have not read many works that have been written upon my subject, for had I done so I feel I should never have discovered what I have. I have taken my own course altogether; and if we are to do any good, and to bring facts to light which are to be of use, I believe it can only be done by a man working from his own original ideas. As to what has been written by Professor Piazzi Smyth, upon the way in which I introduce my subject, I can only say that I cannot agree with him. In one place in my paper I have appeared to put forward a rationalistic idea; such ideas are put forward very prominently sometimes, but my object in putting forward the one I allude to was to show that the rationalistic idea would not stand for a moment. I entirely agree with Mr. Weldon and others in the idea that serpent-worship was devil-worship, and that view is strongly maintained in the very last page of my paper; the term "devil-worship" was, of course, applied to it by Christians. The necessary limits of such a paper have confined me a great deal, I have as far as possible endeavoured to break new ground, besides leaving room for the expression of opinions into which I had not space to enter. I desired to view the subject as an inherent worldling might be supposed to view it, apart from the antecedents which any such person would no doubt reject, but which I, of course, am bound to assume, and having shown that that view would not hold water, I then went forward to view it as you do; but it was not my purpose to make the subject a purely scriptural one. With regard to my appearing not to speak of certain things which belong to the subject, it must not be supposed that because I do not put them into my paper, I do not agree with them. With regard to what was stated by the Hon. Secretary, I did not say that there were no mountains in the neighbourhood of the pyramids, but that the people wanted mountains nearer at hand; and in another of my writings I have pointed out that it was an Eastern custom to have the place of worship close at hand: "It is too much for you to go up to Jerusalem." (1 Kings xii. 28.) It was the custom of the Egyptians to carry their dead westward, and in that direction the pyramids supply the place of mountains. I do not know that I have any other points of criticism to answer, except that Professor Piazzi Smyth has referred to only one of the forms of Egyptian pyramids; and that, while I agree with Mr. Waddy as to the effect of abandonment or disuse of the true worship, I have based my argument *subsequently* to a catastrophe resulting from indifference or abandonment, and not on anything during a progress towards abandonment. I have to acknowledge valuable information from the Rev. Canon Stephenson, and on this and cognate subjects from the Rev. Richard Wilson, D.D., and on Scottish matters from my old friend of college-days, "Cuthbert Bede."

The Meeting was then adjourned.