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ORDINARY MEETING, JANUARY 20, 1879.

THE REV. R. 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 :—W. H. Anderson, Esq., C.E., Ceylon.

ASSOCIATE :—Rev. H. Brass, M.A., F.G.S., Red Hill.

The following paper was then read by the author :—

FINAL CAUSE; a Critique of the Failure of Paley and the Fallacy of Hume. By JOSEPH P. THOMPSON, D.D., LL.D., of Berlin.

IN his "History of English Thought in the Eighteenth Century," Mr. Leslie Stephen pays an earnest and impartial tribute to the two writers of that period, who were the foremost disputants upon the doctrine of a final cause in Nature as proving the existence of God,—David Hume and William Paley. Of Hume he says :— "We have in his pages the ultimate expression of the acutest scepticism of the eighteenth century,—the one articulate statement of a philosophical judgment upon the central questions at issue."* And again :—"Hume's scepticism completes the critical movement of Locke. It marks one of the great turning-points in the history of thought. From

* Chap. vi. sec. 3.

his writings we may date the definite abandonment of the philosophical conceptions of the preceding century, leading, in some cases, to an abandonment of the great questions as insoluble; and, in others, to an attempt to solve them by a new method. Hume did not destroy ontology or theology, but he destroyed the old ontology; and all later thinkers, who have not been content with the mere dead bones of extinct philosophy, have built up their systems upon entirely new lines."*

Of Paley Mr. Stephen says:—"The Natural Theology lays the basis of his whole system. The book, whatever its philosophical shortcomings, is a marvel of skilful statement. It states, with admirable clearness and in a most attractive form, the argument which has the greatest popular force, and which, duly etherealized, still passes muster with metaphysicians. Considered as the work of a man who had to cram himself for the purpose, it would be difficult to praise its literary merits too highly. The only fault in the book, considered as an instrument of persuasion, is that it is too conclusive. If there were no hidden flaw in the reasoning, it would be impossible to understand, not only how any should resist, but how any one should ever have overlooked the demonstration."†

In the history of polemics there is hardly another instance of such collapse of popularity as has befallen the book, the style and method of which Mr. Stephen has here so justly praised. The argument of Paley was regarded by theologians of his time as invincible; and his illustrations from Nature were so attractive to youth that his "Natural Theology" was adopted as a text-book in colleges. Upon the basis of his famous axiom was built up the series of "Bridgewater Treatises," in which anatomy and physiology, astronomy, geology, and various branches of physics were brought to illustrate and establish the evidence of design in Nature. So keen a logician as Archbishop Whately used his acumen to adapt Paley's reasoning to the later discoveries and developments of science; and so careful a physicist as Dr. Whewell led his "Induction of the Physical Sciences" up to the same conclusion. Yet to the present generation, within less than eighty years from its first appearance, Paley's "Natural Theology" is already antiquated as to its once brilliant and conclusive demonstrations, and as an authority is well-nigh obsolete.

Quite otherwise has been the fate of Hume. Mr. Stephen

* Chap. iii. sec. 43.

† Chap. viii. iv. 38.

reminds us that "his first book fell dead-born from the press; few of its successors had a much better fate. The uneducated masses were, of course, beyond his reach; amongst the educated minority he had but few readers; and amongst the few readers still fewer who could appreciate his thoughts."* Add to this that Hume, though deeming himself a match for the philosophers and theologians of his time, had a secret dread of that religious pugnacity in the common people of Scotland which is so quickly roused against an assailant of popular beliefs, and therefore kept back, to be published after his death, his "Dialogues on Natural Religion,"—the book most fitted to provoke that acrimonious criticism which insures literary success. Now, however, within a century of its first appearance, we find this masterly product of Hume's dialectics still acknowledged as the standard treatise of philosophical scepticism. Scotch philosophers since his day have laboured to reform philosophy in the light of Hume's criticism; Kant attempted to refute his scepticism; John Stuart Mill virtually built upon Hume; and he has lately been revived in Germany, with the honour of translation and the prestige of authority. His fame grows with time. This is due partly to the beauty of Hume's style, and the clearness and depth of his reasoning; due also to the decline of theological asperity, and the growth of a tolerant spirit among various schools of thought; and due not a little to the tone of audacity,—or what he himself styled "a certain boldness of temper,"—with which Hume assailed convictions which had come to be accepted as axioms both in philosophy and in religion. And I am of opinion also that no small part of the favour which has accrued to Hume is due to the metaphysical fallacies which have sprung up side by side with the scientific facts which have discredited Paley. The whole history of science discloses a disposition to metaphysical speculation awakened by each new discovery in physical nature. With every fresh deposit of facts upon the borders of science comes a fresh brood of fallacies upon the adjacent borders of hypothesis; and the progenitors of these have a natural affinity for the greatest of sceptics, who was notably the dupe of his own fallacies. This phenomenon of the simultaneous generation of fact and fallacy is itself worthy of scientific investigation. But it is enough to note it here as showing that the failure of Paley's demonstration of God in Nature should not drive us over to Hume's contradiction, which is demonstrably a fallacy.

* Chap. i. 1.

Paley's statement of the doctrine of an end in Nature was from the first open to these two objections.

(1) Instead of formulating a proposition to be proved, or pointing to the sources from which the conviction of its truth arises in the mind, Paley tacitly assumed the thing in question, and wrapped this assumption in a self-repeating phrase which he sought to strengthen by multifarious illustrations.

(2) Assuming that design or contrivance exists in the whole field of Nature, Paley was betrayed into the use of illustrations, sometimes far-fetched, sometimes superficial or lacking confirmation, which wear the appearance of making out a case.

"There cannot be design without a designer, contrivance without a contriver," was the axiom upon which Paley built up his treatise. He does not seem to have been aware,—at least, he takes no notice of the fact,—that Hume had assailed this axiom, and the very illustration of the watch by which Paley so triumphantly asserts it, at the one point at which it might be vulnerable, and if vulnerable, then worthless to Paley's end, viz., that the axiom rests solely upon experience, and holds only within the range of possible human action and observation. Though Hume's assertion is a fallacy, yet he had put it so plausibly that Paley could not afford to pass it by; and by leaving his fundamental premise open to doubt and contradiction, Paley failed to establish the existence of a Supreme Being from traces of design in Nature, however curious and multiplied. Indeed, he himself fell into the common fallacy of begging the question in the very statement of it.

That design implies a designer is as obvious as that thought implies a thinker; but the materialist denies personality to the thinking substance; and to apply the term design to every hint of adaptation in Nature, in the sense of an intelligence shaping matter to an end, is to *assume* the existence of God in the very form of proving it.

It was also an error of Paley that he sought to make out the *goodness* of the end, as part of the evidence of a supreme contriver; or at least to show the preponderance of good over evil in apparent ends. In this endeavour he was sometimes so unfortunate as to throw the weight of his illustration into the opposite scale. Thus, in asserting that "teeth were made to eat, not to ache," he failed to dispose of the fact that they do ache, as an objection to any ruling design in their structure and composition. Their aching is not always due to some violation of nature, since wild beasts in our Zoological Gardens sometimes require dental surgery. It will not quiet the jumping tooth-ache, nor ease a neuralgic nerve to assure the sufferer that teeth and nerves were not made for the purpose

of giving pain. Indeed, it is quite a popular fancy that nerves are demons of evil. The *whence* and the *wherefore* of evil must be taken into view in forming an estimate of the end for which a thing was made, of unity and wisdom in its design, or of any purpose whatever in its existence. But the question of a final cause in things is not to be set aside by some single characteristic or quality of a thing which seems to mark it as useless or even injurious.

That every event argues a cause is an intuitive, not an experimental, conviction of the human mind. Whether the cause is intelligent and purposing, or is only a material or an accidental antecedent, is to be determined by observation and analysis of the thing itself in its place, and its relations. Moral qualities or purposes, suggested by certain properties of a thing as inhering in the Cause,—if Cause there be,—do not necessarily enter into the proof of the existence of an intelligent Cause, which might be either good or evil. Stripping Paley's statement of its verbal assumptions, and setting aside such of his illustrations as are crude or antiquated, his fundamental argument for the Creator as evinced by the traces of design in Nature is not only tenable in face of the more recent discoveries of science, but is illustrated and confirmed by a far richer array of natural phenomena than Paley had ever imagined. We may improve, however, upon his statement of the doctrine of final causes as follows: The perceived collocation or combination of phenomena or forces in Nature toward a given result, produces in the mind the immediate conviction of an intelligent purpose behind such phenomena and forces. This statement, while it retains the essence of Paley's axiom, avoids his logical vice of including in the definition the very term to be defined. A fixed series of events may be mechanical; but the *combination* of several independent series of phenomena toward a distinctive result must be referred to *Thought* purposing that event. Nature with all her forces and material has never produced a single thing that answers to the idea of an *invention*. This is always the product of human intelligence applied to the powers and substances of Nature. The contrivance seen in a machine instantly refers us to the mind as its cause. Thus, electricity is a power everywhere present in Nature; yet electricity has never produced an electrical machine, an electric telegraph or telephone, or an electric light. But though Nature cannot turn her own powers into a practical machine, and the least hint of an adaptation of these powers to the purposes of man suggests the intervention of the human intellect, yet the natural powers which man subordi-

nates to his intelligent uses remain greater and more wonderful than the inventions to which they are applied. Are then the powers and substances of Nature which stand, as it were, waiting for the touch of the inventor's genius to make them available wherever mind shall lead the way, themselves mere things of chance or products of material law with no *intent* in their existence? When made available do they proclaim intelligence, and yet is the marvellous property of *availability* only a meaningless phenomenon of matter? Hitherto the phraseology of the doctrine of design, and the illustrations of the doctrine, have had a certain coarseness of fibre, suggesting a mechanical universe turned out by what Cowper styles "the great *Artificer* of all that moves," and needing the constant oversight of the Maker to keep it in working order. The sublime personifications of the creation in the Bible have been literalized by our matter-of-fact philosophy, as though the differential calculus could measure the astronomy of Job or of the 19th Psalm. But science, by bringing us into nearer contact with what Tyndall has called the "subsensible world," has at once enlarged the sphere of our vision, and heightened its powers. Teleology addresses itself to some finer sense within. It widens its circle without changing its centre. The mechanism of the universe drops away, and we find or feel the *Thought* of the Infinite Mind projecting itself in the actual through finite forms, and combining and comprehending the whole in an ever-unfolding purpose. Hence, we may say with von Baerenbach, "Darwin has not rendered Teleology impossible under any and every form, but has conducted philosophical science to another and the true conception of design."* True, von Baerenbach would find the solution of the universe in *Monism*; but his testimony from a scientific point of view shows that the question of Causality cannot be laid aside, and that, after all sciences, Nature persistently demands the *Wherefore* of her own phenomena.

Zeller, of Berlin, in his paper read before the Academy of Science "upon the Teleological and the Mechanical interpretations of Nature in their application to the universe," seeks to combine the necessary in Nature with the purposive in Reason. "Since, on all sides, the investigation of Nature, so far as it has been carried, shows us a firm linking together of cause and effect, we must assume from the coherence of all phenomena, that the same holds also of those which have not yet been investigated and explained, that everything in the

* "Gedanken ueber die Teleologie in der Natur," von Friedrich von Baerenbach. Berlin, 1878, p. 5.

world proceeds from its natural cause, according to natural laws, and therefore nothing can here be brought in of the intervention of an active purpose bearing upon this fixed result, distinct from natural necessity. Yet we cannot consider these natural causes as barely mechanical; for their effects reach far beyond that which can be explained by motion in space, or resolved into such motion. And if from these same causes along with inorganic nature, life also, and along with irrational life also conscious and rational existence have appeared, not as it were by mere accident in course of time, but necessarily by virtue of their natures, do proceed and ever have proceeded; if the world never can have been without life and intelligence, since the same causes which now produce life and reason must already from eternity have worked, and therefore have produced these continually, so must we call the world, as a whole, in spite of the natural necessity which rules in it, indeed, rather on account of this, at the same time the work of absolute Reason. That this Reason should have been guided in its action by proposed ends, is indeed not necessary.

“Yet, inasmuch as it is one and the same cause from which in the last analysis all effects spring, inasmuch as all the laws of Nature only show the art and manner in which these causes, following the necessity of their existence, work toward many sides, so from the totality of these operations must necessarily proceed a world harmonious in all its parts, a world complete in its way, and arranged with absolute conformity to purpose.”*

A point of still higher moment to the argument Zeller has quite overlooked, viz., that in no case could the mechanical theory be adequate to the solution of the universe. Motion, indeed, might account for all the phenomena of *physics*, with the exception of motion itself. But, after all the facts of *mechanism* are disposed of, there remain the facts and forces of *vitalism*, which refuse to be included under mechanism. Motion cannot originate life, neither can chemistry create or evolve life. We may analyze life into all its constituents and conditions, but cannot detect the life itself. We may combine all the constituents and conditions of life, but cannot produce life. The living organism we know, but the mind demands the cause of life-organization, and sees that this does not

* It is a groundless assumption of Zeller that because life *is* it has always been; an assumption not warranted by the law of scientific induction. The rule of experience by which physicists would bind us forbids such a generalization upon phenomena of which there is no possible record. This is not scientific testimony, but speculative hypothesis.

lie in mechanism. The mechanism of the universe may be concluded within motion and the correlation of forces; but force is a quality, not a cause, and motion demands an origin, and beyond both lie the immensities of vitalism and of intelligence.

Hume attempted to break down the teleological argument by assailing the conception of cause and effect. He maintained that "order, arrangement, or the adjustment of final causes, is not of itself any proof of design, but only so far as it has been experienced to proceed from that principle," and also, that our experience of design, from the operations of the human mind, cannot furnish an analogy for "the great universal mind," which we thus assume to be the Author of Nature. Hence, according to Hume, before we could infer "that an orderly universe must arise from some thought and act, like the human, it were requisite that we had experience of the origin of worlds, and it is not sufficient, surely, that we have seen ships and cities arise from human art and contrivance."

The first position of Hume is refuted by the universal consciousness of mankind. Most assuredly our belief that any particular object in which we perceive the adaptation of parts to each other, or of means to an end, must have proceeded from a designing cause, does not arise out of a previous observation or experience of such cause in objects of *the same class*. Of the millions of men who wear watches, how very few have ever seen the parts of a watch formed and put together! Yet every possessor of a watch is sure that it had a maker; and this conviction could not be strengthened by his going to Geneva and seeing watches made by hand, or to Waltham and seeing them made by machinery.

The first maker of a watch had no "experience" to follow. He used his own inventive skill. The watch existed in his mind before he shaped it in metal. And when the first watch was completed it testified *of itself*, to every observer, of the designing mind and the cunning hand which had produced it. And this because, as Hume himself says, "Throw several pieces of steel together without shape or form; they will never arrange themselves so as to complete a watch." This is not an inference from the study of such a casual heap of steel, but is an immediate and irresistible cognition of the human mind. One does not need to trace the loose bits of steel from their entrance at one end of the factory to their emergence as a completed watch at the other, in order to be satisfied that, at some point of their course, a designing hand has adjusted them to each other. The perceived adjustment

produces this conviction instantaneously; and no amount of experience could render the conviction more certain. The conviction that a particular combination of means for an end is the product of a designing cause, is not at all dependent upon the "experience" of such cause in *like* cases.

Neither does the conviction that adaptation proceeds from design rest upon "experience" in *any* case whatever. That the adaptation of means to an end proceeds from an intelligent and purposing foresight of that end is an intuitive conviction of the human mind. To be convinced of this causal connection the mind requires neither argument nor observation; it could accept no other explanation of the existence of the event. The mind assumes this causal relation of intelligence to adaptation, in those very observations of nature or discoveries of inventive skill which Mr. Hume would include in the term "experience."

As the print of a human foot upon the sand gave to Robinson Crusoe the immediate conviction that there was another man upon what he had supposed to be his uninhabited island; as the impressions of feet, talons, fins, vertebræ, embedded in rock, certify the geologist of extinct races; so does the least token of adaptation at once articulate itself with the conception of design.

In the gravel-beds of the Somme were picked up at first a few flint stones, bearing rude marks of having been shaped for use. No human remains were associated with them. The beds in which they lay were hitherto supposed to antedate the appearance of man; yet these shapen flints produced in every observer the instantaneous conviction that man was there at the period of this formation. When once the eye had satisfied itself that these forms were not the result of natural attrition, were not worn but shaped,—that this flint, however rudely shaped, was *intended* for a knife or a hatchet, this block for a hammer, this pointed stone for a spear,—the mind at once pronounced it the work of man. The adaptation points to design, and the design points to a grade of human intelligence. It does not matter that we cannot divine the specific use of this or that implement; if the object itself shows that it was shaped for *some* use, if it is not merely a stone but an implement, there springs up at sight of it the necessary conviction that this was the work of a designing cause. Hence Hume's appeal to "experience" is fallacious in the general as well as in the particular.

Equally fallacious is Hume's objection to the analogy from the products of human design to the works of a higher intelligence. The scale of the works, the vastness of the

intelligence requisite to have conceived, and of the power to have executed them, have no place in the conviction of design. This arises from the single fact of *adaptation*, whether seen in the wheels of a watch or of a locomotive, in the point of a pin or the lever of a steam-engine, in the antennæ of an ant or the proboscis of an elephant. Could Lord Rosse's telescope itself be projected by a series of lenses to the farthest star within its field, this immensity of adaptation would no more exhaust the principle than does the actual size of the telescope as compared with the eye of a beetle. Size, number, magnitude have no relation to the notion of adaptation, which in and of itself produces the conviction of design.

Moreover, the human mind is the only possible unit by which we may compute the operations of "the universal mind." If we drop the argument from design, and fall back upon ontology, still the finite mind which we know in consciousness is the only agent by which, through analogy, contrast, or negation, we can attain to a conception of the Infinite.

The very observations which Hume would classify under "experience" must be made and recorded by this selfsame mind; and no man has a higher confidence in the scope and the trustworthiness of its powers than the philosopher who attempts to account for the existence of Nature without either a cause or an end. But as our conception of causality and of personality, derived from consciousness, is capable of being projected from ourselves into the infinite or "universal" mind,—just as we can project a mathematical line or circle into infinite space,—so adaptation seen in Nature reflects our conception of design up to the highest heaven and back to the farthest eternity.

The mathematician does not pretend to comprehend the infinities or the infinitesimals which he nevertheless conceives of as quantities in his calculations. It would require his lifetime to count up the billions which he handles so freely on a sheet of paper. The mind which can conceive of infinite number and of universal space without comprehending either, can also derive from itself the conception of a "universal mind." To do complete justice to Hume, I will now sum up his argument and my reply. In his essay on "Providence and a Future State," Hume says:—

"Man is a being whom we know by experience, whose motives and designs we are acquainted with, and whose projects and inclinations have a certain connection and coherence, according to the laws which Nature has established for the government of such a creature. When, therefore, we find that any work has proceeded from the skill and

industry of man, as we are otherwise acquainted with the nature of the animal, we can draw a hundred inferences concerning what may be expected from him; and these inferences will all be founded in experience and observation." Hence he concludes, we cannot "from the course of Nature infer a particular intelligent cause, which first bestowed and still preserves order in the universe,"* inasmuch as we have had no experience of such a cause in Nature, upon which to ground this inference.

At least three oversights or misconceptions are apparent in this statement.

(1.) Mr. Hume overlooks the fact that each man is conscious of a designing faculty within himself, and does not need to be certified of the adaptation of means to ends through the observation of this faculty in other men. There was a time when a first man invented the first machine, or adapted something to his own ends; and surely he had no experience of design in other men to create faith in himself as a designer. He put forth a conscious power; his experience of what he could accomplish confirmed his conception of design, but did not create it. So it is with us all. When we see adaptation to an end, we say at once, Here was an intelligent cause, and this not because we have observed that other men have produced designs, but knowing ourselves as intelligent designing causes, we of course refer adaptation to intelligence.

(2.) This points us to Hume's second oversight; he fails to perceive that the single thing to which adaptation refers us is *intelligence*. It is not man in general as a being or an animal, but the *intelligent spirit* in man that is immediately and indissolubly connected with the notion of adaptation. Man does many things that are purely animal; he eats, walks, sleeps, like other animals, by an instinct or a law of his nature, and we never think of ascribing such acts to an intelligence superior to physical laws and functions. But the adaptation of means to ends we refer directly to such intelligence; and it is this thing of intelligence that differentiates such effects from purely physical sequences by the nature of their causes. Crunched bones on a desert island might suggest beasts of prey, but a *cairn* suggests man. An approach to such adaptation on the part of the beaver, the bee, the dog, the ant, disposes us to clothe such animals with the attribute of reason. And on the same principle,—that it is intelligence and not man we think of directly we perceive adaptation,—do we refer such adaptation in Nature to an intelligence higher than Nature

* "Prov. and Fut. State," vol. iv. p. 168.

and higher than man. It is Intelligence that we associate with adaptation, and we are not limited to intelligence as manifested by man as an animal of skill and industry. In point of fact the great advances of physical science in recent times have been due more to the imaginative and inventive faculty prompting investigation, than to inference from experience. Science itself looks forward, not backward. Its spirit is inquisitive, and its discoveries spring from the desire to know not only *what* is, but *why* it is,—to reach at once the first elements of things and their final cause.

And (3.) Hume has overlooked the fact that when once this idea of the connection between adaptation and intelligence has entered the mind, from whatever source, it does not require to be renewed, but remains always as an intuitive perception; no amount of experiences can strengthen or weaken it, and this for the reason that the conviction of a designing cause does not rest in observations or experiences, greater or less, of man and his contrivances, but lies in the thing of perceived adaptation; it does not require a knowledge of the cause or source of the adaptation. That wherever there is an adaptation of means to an end, there must have been an intelligent cause is an intuition of the mind. This term intuition should not be confounded with the notion of *innate* ideas. An intuition is a self-evident truth; the mind may come to the knowledge of such a truth in various ways, and by many processes; but when once it is perceived, it is seen to be true, as a proposition in and of itself, which no amount of reasoning or of evidence could make clearer or stronger than it is in its own simple statement. For example, the sum of all the parts is together equal to the whole. (A child may learn this, if you please, by trying it; but once gained it is *there*.) Everything that begins to be must have a cause; whatever exists must exist in time and in space. To this class of self-convincing truths belongs this also, that the adaptation of means to an end springs from an intelligent and designing cause. Under these criticisms of common sense and of universal consciousness Hume's elaborate structure falls to the ground.

I am aware that this reasoning involves the interminable controversy between sensation and consciousness as the originator of ideas. But it is clear that external phenomena do not and cannot impart to us the idea of a cause. We cannot see a cause, feel a cause, hear a cause. What we perceive in Nature is never *cause* as a substantial entity, but only the sequence of phenomena. And yet the mind unhesitatingly affirms of every phenomenon which actually comes to pass, that it is not self-originated, but must have had a cause. Whence has the mind this conception of the necessary rela-

tion of an event to a cause? I answer that this is a necessary cognition of the human mind, given in and of the mind itself. The mind knows itself as a cause. It does not matter here whether this knowledge be spontaneous or the result of mental experiences. Of the first origin of cognitions in a child, the first realization of consciousness, we have no possibility of record. But this we know; that there comes to every mind a moment when it awakes to the feeling "I can" and "I will." It knows the Ego in consciousness, and clothes the Ego with volition and with causality. With the blow of a hammer I break a crystal. We say the blow is the cause of the fracture; and this loose use of the term cause is sanctioned by usage. But where and what is the cause? In the hammer? Or in the contact of the hammer with the crystal? Does it reside in the hammer? Or is it developed by the blow? There is no sense nor instrument fine enough to detect it. We see the blow, we see the fracture, but not ten thousand such experiences would enable us to see the cause. The cause, you will say, is the force applied behind the hammer. But that force is not an entity; it is only a quality of the cause, and that cause is the power which is in me put in action by my will. All force is but cause in action. And the sublime doctrine of universal force points of necessity to universal cause, and that cause intelligent. Having its sole idea of cause through the consciousness of itself as a cause, the mind intuitively refers every event to a cause adequate in power and wisdom to the result.

Even upon Hume's own principle, the thing which "experience" has taught us is that the adaptation of means or the collocation of materials *for an end*, must be referred to an intelligent designer purposing that end. And the world has grown so old in the infallibility of this so-called experience, that it accepts the principle as an axiom alike in its application to a watch and to a world. The principle being recovered, we are prepared to apply it more carefully than did Paley to the evidence of Nature to a supreme intelligent Cause.

Teleology is not an invention of Christian theology. In perceiving an end in Nature, and from this assuming a divine Author of Nature, Plato and Aristotle anticipated Paul and Augustine; and we are all familiar with Cicero's reply to the Epicurean notion that the world was formed by a chance concourse of atoms. "He who believes this may as well believe that if a great quantity of the letters of the alphabet, made of gold or any other substance, were thrown upon the ground, they would fall into such order as legibly to form a book, say the Annals of Ennius. I doubt whether chance

could make a single line of them. But if a concourse of atoms can make a world, why not a porch, a temple, a house, a city, which are works of less labour and difficulty?"

Many of the witnesses which Paley brought forward to establish the fact of design in Nature have been discredited through the searching cross-examination of modern science; and some have even been so twisted and turned as to lean to the opposite side. But what then? This impeachment of testimony prejudices the jury, but cannot blind an impartial judge to the principles which underlie the case. Much the same has happened in Geology. Many of the facts relied upon by earlier geologists have been modified in their meaning and their relations, or have been quite set aside by the research of later times. Theories have changed with every new master of the science, and the now-accepted theory of Lyell may yet be modified by the results of deep-sea soundings and of explorations in the Sierra Nevada. But no one dreams of doubting that there is in the structure of the earth a foundation for a science of Geology. And so we may trace there a foundation for a science of Teleology, all the more clear because the superficial mechanism of design has been swept away. Indeed, the very terms designer, contriver, smack of the mechanical, the coarse, the vulgar. Professor Tyndall, who certainly has no belief in final cause in the theological sense, is already helping us to finer terms for Teleology itself; and these terms occur in examples best fitted to illustrate the finer meanings and methods of this science. These examples are found in heat and in light.

There is even more of science than of poetry in the saying that coal is "bottled sunlight." For what purpose was coal produced, but that it should serve for fuel; should be made to give back in practical and beneficial uses the heat it had condensed from the sun? And for whose use intended but for man? Nature in her operations has no service for this concentrated extract of ferns and trees. No animal tribes in burrowing or foraging had ever sought out the coal, or applied it to their wants. But when man had need of other fuel than the surface of the earth could furnish him, there lay the beds of coal ready to his hand. Can we resist the conviction that coal was provided in anticipation of the coming of man—stored, so to speak, in the cellar of his future abode? If there were, indeed, such a purpose in the formation of coal, the relation between the purpose and the result is the more impressive because it was so long latent, and required ages for its development. Not fact and form alone, but idea and intent as well, are in process of development. The plan in evolution is also the evolution of a plan. Prof. Tyndall has

given us the very term to characterize this phenomenon. "Wood and coal can burn; whence come their heat, and the work producible by that heat? From the immeasurable reservoir of the sun, Nature has *proposed to herself* the task of storing up the light which streams earthward from the sun, and of casting into a permanent form the most fugitive of all powers. *To this end* she has overspread the earth with organisms which, while living, take in the solar light, and by its consumption generate forces of another kind. These organisms are plants. The vegetable world indeed constitutes the instrument whereby the wave-motion of the sun is changed into the rigid form of chemical tension, and thus prepared for future use. With this *prevision* the existence of the human race itself is inseparably connected." In the terms which I have italicised, Teleology is so etherealized that nothing remains of the grossness of the old conception of the mechanism of the universe. *Prevision* is so much finer than design or contrivance! We no longer require to see either the watch or the world in the process of making; we no longer hear the starting of the machinery; but as in Ezekiel's vision there is a spirit of life within the wheels, and they are borne on mighty wings.

The objection to this illustration, that if coal were intended for the use of man, it should have been evenly distributed over the globe, and upon the surface, seems too frivolous for a philosophical reply. But the reply is given in the whole nature of man, and in the totality of the ends of his existence. Man shall not live by coal alone. The distribution of the earth's products gives rise to that system of industries, to that development of energy, skill, foresight, and invention, and to that brotherhood of humanity which comes of widespread intercourse, which render human existence so much higher than that of brutes.

I am not strenuous, however, for this illustration. I have adopted it because a leading man of science seems driven to teleology to account for the fact of coal. Thus teleology, as in Harvey's discovery of the circulation of the blood, is often the guide of science to higher ends.

My object in this essay is not to prove the doctrine of final causes, but to point out the lines of proof; in the true conception of causality, and in the wise interpretation of those more subtle phases of Nature which science now deals with, and which so transcend the mechanical causes of Paley.

As with heat, so with light. To describe the web of relations subsisting between solar light and the media through which this passes to the human eye, Tyndall has recourse to the same refinement of teleology.

"We have, in the first place, in solar light an agent of

exceeding complexity, composed of innumerable constituents refrangible in different degrees. We find, secondly, the atoms and molecules of bodies gifted with the power of sifting solar light in the most various ways, and producing by this sifting the colours observed in nature and art. To do this they must possess a molecular structure commensurate in complexity with that of light itself. Thirdly, we have the human eye and brain, so organized as to be able to take in and distinguish the multitude of impressions thus generated. The light, therefore, at starting is complex; to sift and select it as they do, natural bodies must be complex; while to take in the impressions thus generated, the human eye and brain, however we may simplify our conceptions of their action, must be highly complex. Whence this triple complexity? If what are called material purposes were the only end to be served, a much simpler mechanism would be sufficient. But, instead of simplicity, we have prodigality of relation and *adaptation*,—and this apparently for the sole *purpose* of enabling us to see things robed in the splendour of colour. Would it not seem that Nature *harboured the intention* of educating us for other enjoyments than those derivable from meat and drink? At all events, whatever Nature meant,—and it would be mere presumption to dogmatize as to what she meant,—we find ourselves here as the upshot of her operations, endowed with capacities to enjoy not only the materially useful, but endowed with others of indefinite scope and application, which deal alone with the beautiful and the true.*

In how many distinct forms and phrases in the two passages cited, does Mr. Tyndall pay homage to the intuitive conviction of purpose, intention, design as seen in the adaptations of Nature: “Nature has proposed to herself”; “to this end”; “with this prevision”; “atoms gifted with the power”; “prodigality of relation and adaptation”; “for the sole purpose”; “Nature harboured the intention”; “whatever Nature meant.” Tyndall is a master of language, whether as the poet picturing the Alps, or as the philosopher analyzing and defining Nature. In these passages he is the man of science upon his own ground, reporting his observations and experiments. And he tells us that in two of the most delicate, subtle, yet all-pervasive forces of Nature,—heat and light,—he finds everywhere traces of intelligence. Since only intelligence can harbour an intention, can have a meaning or purpose, or act with prevision for an end.

Two parallel incidents in geology will show that the scientific mind intuitively discriminates between Nature and Intelligence.

* Tyndall on Light, Lec. 1.

(1) In digging a well in Illinois, the workmen at a depth of several feet struck upon the trunk of a tree, and under this upon a bit of copper ore identical with that of Lake Superior. The inference was that ages ago the copper had been washed from its native bed, and lodged in the alluvium of the Mississippi valley,—perhaps that the great lakes then had an outlet through the Mississippi,—and over this deposit a forest had grown, which in time was buried beneath the ever-accumulating surface. The whole process was ascribed to natural causes,—the interest concentrating in the question of time. (2) In working the copper-mines of Lake Superior, the miner came upon traces of excavation, of smelting, of rude implements of labour; and the immediate conviction was, *Man* has been here before us,—probably that unknown race who built the mounds in the Mississippi valley had discovered and worked these mines. How shall we account for the difference in these judgments,—the one pointing to Nature, the other to Man? The judgment in each case was spontaneous, and each judgment is accepted by science as correct. The dividing line between them is, that perceived adaptation to an end betokens an intelligent purpose directed to that end. A corresponding instance is familiar to English geologists.

At a considerable depth in the delta of the Nile were found remains of pottery. The immediate conviction was that man was on the soil at the period of this formation. Beyond question the pottery was the work of man; and the geological age of the deposit would determine how far back man existed on the borders of the Nile. When it was suggested that the pottery bore marks of Greek workmanship, the inference was that either by accident it had worked its way so deep, or the Nile deposit had been more rapid than is commonly supposed. The question recurs, how do we make this distinction between Man and Nature? and the answer lies in the one fact of adaptation to an end.

Now, Professor Tyndall assures us that in the single fact of light and vision “we have prodigality of relation and adaptation.” From the point of view of physical science he cannot look beyond the bounds of Nature, and hence he provides the intelligence which adaptation demands by *personifying* Nature. I accept implicitly Tyndall’s testimony to the wondrous fact; and not being under the restriction which the pure scientist must observe, I accept the conviction of my own intelligence that *such* intelligence is above Nature. The principle of Teleology is thus attested by science itself in its most subtle and intricate investigations. Indeed, that principle becomes more patent the farther it is removed from the sensuous into

the *sub-sensible* world. There we touch upon causes, first, mediate, and final. It does not matter that the relation of cause and effect is often obscure. Could we have looked upon our planet in the Carboniferous era, who could have seen reflected in that murky atmosphere the coal-grate glowing in our dwellings, the furnace in our factories? We are living in an unfinished system, an era of the evolution of phenomena, and, as I have said, the development of the ideas that lie at the back of phenomena.

Neither does it disparage Teleology to point to the evil that is in the world. Moral evil is the product of man's free agency. But free will is the highest endowment of a rational creature. The power of moral choice makes man akin to the Infinite and the Absolute; and moral evil is a perversion of this most illustrious attribute of being, and the possibility of perversion lies in the nature of free will, and gives to virtue its worth and its glory. Hence it may be that moral evil is incidental, in respect of divine prevention, to the best possible system.

As to physical evil, this is but partial and relative. Our own experience testifies that this often serves to discipline the intellect of man, to put fibre into his will, and train him to noble and heroic action in subjugating Nature to the service of the human family. The very doctrine of Natural Selection shows of how much worth to man is the struggle for existence as a moral element in the development of character.

Here, too, comes in the fact that the system is unfinished. Things that seem untoward because unknown may have a brighter end: "from seeming evil still educing good."

Science is teaching this, especially in chemistry, by transforming what once was feared as hurtful and hostile to man into some higher ministry of the Beautiful and the Useful, ordered by wisdom and beneficence. What serviceable dyes, what exquisite tints, are evolved from the noisome refuse of coal-tar!

And just this service should science render if Teleology is true. For if there be a Creator, He must be spirit, and apprehensible only by spirit. Hence, the more we are developed in mind by science, and the more we penetrate through science to the silent, impalpable forces of Nature, the nearer shall we come to Him who is invisible; till, with Dante, emerging into the light Eterne, we can say:—

"And now was turning my desire and will,
Even as a wheel that equally is moved,
The Love which moves the sun and the other stars."

The CHAIRMAN said : I think I may, in thanking Dr. Thompson for his temperate, able, and lucid paper, take the liberty of tendering to him our hearty welcome, and say how much pleasure we have in seeing in this room a friend from the other side of the Atlantic.

Right Rev. Bishop PERRY, D.D.—I very heartily respond, sir, to what you have said in commendation of the paper. I am sure it must have inspired all who have listened to it with admiration for the reasoning powers and eloquence of the author. His metaphysical talent is evident throughout the whole. But my wish is to say something on behalf of my old friend Paley (hear, hear), and also to make some remarks on one who, although a very able, is yet a very fallacious reasoner—Hume. With reference to Paley ; our lecturer has referred to the basis of his argument, that “There cannot be a design without a designer,” and has stated that there he has assumed what he should have proved. I think that he rightly assumed it. Paley did not write for materialists ; he did not enter into the argument as to how we get the idea of a designer—he assumed that we had it. The lecturer has spoken very ably of the intuitive conviction that we have of an intelligent and designing cause, and it was on this conviction that Paley proceeded. If I may venture to say so, the statement of the lecturer himself is of the same character. He does not really prove more than Paley ; and his statement, although correct, is expressed in such terms as would not convey a very clear idea to ordinary readers. I do not know whether I am right in appealing to this room as to whether they understand the meaning of “A collocation or adjustment of phenomena or forces in nature toward a given result produces in the mind the immediate conviction of an intelligent purpose behind such phenomena and forces.” If Paley had introduced this phraseology into his book, it would have been out of place. I trust Dr. Thompson will kindly bear with me for making these friendly critical remarks. I believe that, when we see a machine, we have an intuitive conviction that it has been made under the working of some intelligent mind ; in other words, that “there cannot be design without a designer.” Do you not all agree with this ? It is not an undue assumption. I have some difficulty in speaking on the present occasion, because it is nearly fifty years since I looked into Paley and Hume, and unfortunately before I left Melbourne I gave them both to the Diocesan Library ; I speak, therefore, only from recollection. But this, I think, is Paley’s argument : If you find a watch, you would infer that there must have been a watch-maker. So there must have been a maker of the eye ; and as some man must be the maker of the watch, so the Great Creator of the universe must have been the maker of the eye. That is Paley’s argument ; and although, from the want of accurate scientific knowledge, there may be some errors in his book, the argument is, I think, as the lecturer has himself remarked,

thoroughly sound, and is put in an exceedingly clear and forcible manner. Now we come to Hume. His argument is: "That the notion of cause and of design is derived from our observation and experience of nature, and cannot be generalized beyond the sphere of human action and experience." The lecturer says that this is a fallacy, because "in nature we never see a cause, but only sequences. The notion of cause proceeds from ourselves as intelligent and willing actors and powers." "From this," he adds, "we intuitively and necessarily refer the adaptation of sequences to an intelligent and designing cause." And he goes on: "Experience more or less has no concern with this positive condition of the mind from its knowledge of itself." All this is true; but I do not think that the force of the argument will be generally perceived, or that it is necessary for the refutation of Hume's fallacy. My answer to him would be simply this:—that, when we have acquired "the notion of cause and design," howsoever it may have been derived, we intuitively and necessarily extend it to everything that comes under our observation. In the language of Paley, we believe that "there cannot be a design without a designer." Hence as, when we observe a work of art beyond the power of an irrational animal, we infer that man has been at work; so in like manner, when we observe in nature—using the word in its widest sense—works of art beyond the power of man, we infer the exercise of superhuman power and ability. That is my answer to Hume. Without disputing about his premises, I deny his conclusion. With reference to teleology, it appears to me quite clear that, putting aside all metaphysical argument, and taking simply the common sense of man—and that is what we have to attend to in the controversy with sceptics; if we look at the material world, the vegetable and animal world, and further the moral world, we cannot but come to the conclusion, unless our mind be perverted in some way or other, that the world has had a Creator, and that that Creator possesses a wisdom and power far beyond all human conception. The unity in the world—in the whole universe—shows, as the lecturer has pointed out, an adaptation of means to an end. The wonderful combinations we see necessarily lead us up to an infinitely wise and powerful Creator. I am not so sure that we could say a perfectly benevolent Creator. There is much to perplex a thoughtful man in the contemplation of the mixture of evil and good which is in the world. I can conceive of doubt as to the *unlimited* power, or as to the benevolence of the Creator. Here we come to feel our need of revelation. It is only by revelation that we know the character of God, and in some degree understand the doings of God towards us. Even with the Bible in their hands men are subjected very often to extremely great trials from comparing what they see in the world around them with what it tells us of the Creator; and the paper, which has just been read to us, is very valuable in pointing out that the present is an unfinished state; that there is a plan of development, and that we are to look forward beyond the present world. Just one sentence more. With regard to natural religion, its lessons are most plainly taught us by God Himself in the *Book of Job*.

Dr. IRONS.—I came here thinking that I was going to hear something very different from what I have listened to this evening. I must say I have been agreeably surprised, and I think we must all have been pleased with the paper. I myself am grateful for the very complete view of the subject that has been furnished. But yet the essayist is a little unfair to Paley in putting him in the position apparently adopted. (Hear, hear.) Paley was a great man, his work a great work. As an Oxford man, I did not make so good an acquaintance with him formerly as I have since had. We surely all consider him as something more than Dr. Thompson at first represents him to be. He was much more than a mere stater of the position that “where there is design there must be a designer.” When Paley afterwards comes to deal with the truth that the personal God is the Designer, he does not quite satisfy me metaphysically. I do say, however, he affirmed the same truth in his proposition as Dr. Thompson has defended to-night. For I cannot see the least difference between “the adjustment of phenomena for an intelligent purpose” (as in the paper) and “design with a designer behind it.” It seems to me that Dr. Thompson’s words are to the same effect as Paley’s. Paley could not have meant anything else than Dr. Thompson. He was no crude, careless writer, who took up a proposition in order merely to prove it by some simple rule of Whatelyan logic. He was a careful dealer with facts. A Tyndall could not be more careful. He laid the foundation of his argument as any Huxley or Tyndall might have done. And there is something touching in the story of Archdeacon Paley, when his health was enfeebled and he could do but little actively for the Church, setting himself to study the facts of human anatomy and science, in order that he might use this knowledge to illustrate the truth and wisdom of God whom he loved and served. There was something touching, I say, in the way he devoted himself to the late acquisition of the knowledge which he intended so to use. But who can read his book through, without feeling that it is true, painstaking, careful? And to this day it is read with great profit by the young men of the Universities, and, I would add, by old men too, like ourselves,—though it may be some forty years since I read very much of it. Paley has been used on this occasion, however, so as to point the excellent argument of Dr. Thompson, while Hume has happily been brought forward to receive a crushing rejoinder. We are grateful then to Dr. Thompson for having given us a noble paper. But while saying this, it would seem ungrateful if we were to pass over entirely all the special features of the paper. I will turn aside then for a moment just to take notice of one point which seems to require a little clearing up. The professor said that “forces in nature were qualities of the things themselves.”

Dr. THOMPSON.—What I said was that force was a property of cause, not of things themselves.

Dr. IRONS.—Yes, but I thought you said that though the facts led us at last to argue a cause; the phenomenon induced us to suppose force latent in the thing, and that after this we argued a cause beyond.

Dr. THOMPSON.—No, I did not say a force latent in itself.

Dr. IRONS.—But I have something to ask, even as you now put the matter.

Do you say the force is the cause? or, is it some property *in* the cause? Either is very difficult to understand. Science, I see, takes us up to the last edge of the dead phenomenal. What is it that then sets the phenomenon in motion? That is the question. It must either be something identified with the phenomenon—(which would make the “First Cause” part of the universe)—or it must be a *kinesis* linked to the phenomenon; or, thirdly, it must be something distinct from the phenomenon. I can conceive of no other than these three statements of what that must be which gives motion to phenomena. I apprehend that every Christian would say the last, viz. that the cause is essentially distinct from the phenomenon; or else we should deny the whole idea of Creation. We put it as the Christian position that God created all things out of nothing; in other words, He projected apart from Himself all things that now exist out of Himself—(for God Himself changes not). It follows that they are not God nor linked to Him. If we accept this conclusion, I think we should be in difficulty if we also adopted Dr. Thompson’s; for his would place God as immediately touching the several phenomena of the universe as the force, without any intermediate created force. I cannot believe that God moulds the leg of that table or each hair of my head, in such a sense as that each is done by the *immediate* touch of God. I rather believe Moses, when he said that a created life was given to the creature. In these instances—the “table,” and the “hair”—the force is *mechanical* immediately (and man beyond), in the first, and *vital* in the second. I believe that God projects, that is, puts various kinds of life apart from Himself, and that life is force,—a distinct creation (Gen. i. 12). It seems to me there would be something almost atheistical in the thought of putting God locally, in relation with each phenomenon as the immediate cause; because also it would make God capable of being extended. It would conceive of His Divine omnipresence as a local ubiquity. I protest then against any notion of placing God as force before every detail of phenomena, since it cannot be thought out, without materializing God. I must now leave this to Dr. Thompson. I really want instruction on the point.*

Mr. BUNTING.—I should like to hear what the author of the paper says to a very common modern objection to Paley’s argument—that you may carry it a step backwards: If the design imply the designer, what does the designer imply? Why cannot you carry back the argument one step further? Must not the designer itself be a kind of instrument implying some prior construction which implied a further design? I think that Dr. Thompson’s criticism of Paley’s statement is clear and just. His one phrase puts the axiom pithily without tautology.

Sir T. LUSHINGTON.—It appears to me that you will be only going back to a final designer.

* Modern Pantheism aims to make God a part of the universe,—under the plausible name of Force; the truth is, that force is a *creature* of God, though itself unperceived except in its results.—W. J. I.

Dr. IRONS.—Does this not point to the great need of an ontology—a great need of our knowing what we mean when we believe in God?

Rev. Professor Mc ALL.—Being engaged in the education of young men for the ministry, I can scarcely conceive of any composition more valuable than the lecture to which we have just listened, and should it form part of the *Transactions* of the Institute, I should think it would have merit enough to keep the volume afloat and hand it down to a late day. Perhaps it would be better, if there be any one present who is not convinced by the arguments advanced, any one who has any objection to state, that I should give place, for I am most anxious to hear if anything can be said against this lecture. I feel, for one, deeply obliged to the lecturer, and if, in a few minutes, when he may reply, he will meet the objection just raised, that the designer seems to require a designer, then his work will be final and complete, and nothing can be added to the obligation under which he has laid us. (Cheers.)

Sir W. R. LUSHINGTON TILSON, Bart.—I would desire simply to say one word and add my tribute of thanks to the lecturer for his able paper. I entirely went with him in his criticism on Hume's argument, which I think was powerful. With regard to the observations he made when speaking of the "unfinished" condition of things, I think he went to the point, in reference to those difficulties often arising in scientific minds, in saying that without revelation many things in nature and Providence cannot be explained. The existence of evil in our world would lead one away from the idea of a perfectly benevolent Being as having created it, although we see marks of wisdom distinct. But the existence of physical evil must be traced to the existence of moral evil, and then you will see the importance of that word "unfinished." There is a time to come when the whole work will be complete; there is a time to come when moral evil itself will be removed, when, therefore, the benevolence of the Supreme Being will be vindicated; and then, and not till then, can we adequately understand the whole design of the universe. Unless you look forward to that period you will find great difficulties in looking at creation as it is, and will not be able to assert the benevolence of the Creator, although there is clear proof of His intelligence and power.

Rev. Professor LIAS.—I had not intended to intrude myself on the meeting to-night, but I rise at the honorary Secretary's request, just to add one or two observations. I have not had access to either Paley or Hume since I knew I was to be present to-night, but I conceive that the real reason why Paley's popularity seems to be on the wane, is that he happened to be too clear in his language. We all know what it is to be rated for good advice. When one cannot contradict it, the only thing is to abuse the person who gave it. (Laughter.) Now it strikes me that a great deal of the unpopularity of Paley is due to the fact that he states his case too well and forces his arguments too far home.* You will find in the *Natural Theology* of

* Professor Lias wishes to add that in these remarks he was referring to Paley's *Natural Theology* only.

Paley an enormous mass of illustrations, all bearing on the one point of design, and I think the lecturer was a little severe upon Paley's expression, "You cannot have design without a designer." It seems no very great assumption to say that where you see the evidences of a master mind at work, you are entitled to infer the existence of that master mind. And the *Natural Theology* is simply an elaborate mass of such evidence. I may be allowed to add a word on another point. A great deal has been said about the processes of Nature. Now in these we never see the cause, but the effect; and I contend we are entitled to reason from effect to cause, or, in other words, from phenomena to the force which produces them. I have used the word *force*, and it has been frequently used to-night. But it strikes me that we might often avoid much discussion by a clearer definition of the terms we use. What, for instance, do we mean by force? Newton uses it in the sense of the power which constrains a body to move in a certain orbit. And force is surely correctly defined as the unseemly power which produces certain visible results. This is just where Hume's argument is false. He assumes that we are unable to reason beyond the limits of our own experience. But all the great discoveries which have been made in the sciences have been brought about by generalizing on the effect of hidden causes and thus bringing about results unknown before. Science may, therefore, be said to be one vast procession beyond the limits of our own experience. (Hear, hear.) And therefore I ask on what ground can Hume or anybody else say that we cannot climb one step further, and from the force step one degree beyond to the Will that set that force in motion? Force is simply the expression of the Eternal Mind and Will. I have only one other remark to make. The ground of Hume's popularity is, that he has translated into beautiful language those lurking doubts which are known to the best of us. There are times when we do doubt, when we ask ourselves, "Can this all be true? Is there a future above—a heaven or a hell? Is there such a thing as redemption or salvation?" And in these moments of darkness and despair some seem inclined to welcome a doubt, and then we turn aside from faith. But in the experience of life we come to cast aside these doubts. We see that there is something deeper than nature, a great cause of force, and rest at last in the conviction that that cause "is our God, for ever and ever, and shall be our guide unto death."

The CHAIRMAN.—As no one seems to be inclined to make any further remarks, I think it would be very bad taste in me to intrude upon the meeting. It is sometimes desirable that the chairman should, as it were, gather up the threads of the various subjects which have been touched upon. I shall leave this in the hands of the lecturer, and I will ask him to charm us by the replies to the various questions which have been asked him, as he did by his paper.

Dr. THOMPSON.—I thank you for the courtesy so repeatedly expressed; but I feel it would be an imposition on the patience of my audience to reply in detail to the various criticisms and suggestions which have been made upon the argument of my paper. If Paley wrote for the common

mind, I have written rather for the scientific, questioning, controversial mind, not expecting to encounter that here, but thinking that, through the publicity that will be given to my paper, some good might be accomplished outside the circle of belief. Let me here say that I doubt very much the expediency of neglecting scientific precision, for a phraseology suited to the common people. In the end you work mischief in the common mind. When, later on, it encounters scepticism, the mind is thrown into doubt and confusion, for lack of a more careful and critical training in its first notions of science and faith. A popular style should be simple and clear, but by all means precise. My sole object in the criticism on Paley was to call attention to the rule, that in making definitions we should exclude from the definition the name of the thing defined; and my friend Mr. Bunting has explained the phrase I have substituted in the place of Paley's axiom. Combination, adjustment, compel the conviction of intelligent purpose. (Hear, hear.) I should disclaim most sincerely the compliments which have been heaped upon me by the speakers this evening, if it were not that this would disparage your courtesy. As I sat here I have wondered why in the world I ever brought my poor coals to this great Newcastle; and then it dawned upon me that the glimmering of my coal-gas had given occasion for the exhibition of the dazzling electric lights which have flashed upon us, and that therefore I have been the unconscious author of great benefit to the Institute. As to the question of "force," I am sure I never entertained but have always combated the notion of God's direct and immediate agency in every phenomenon of nature. My thought was simply that the thing which is called "force" by scientists, is not a thing they can put their finger on; it is a mere name, used as a substitute for ignorance; that it is only a quality of the "something." I do not say it is always a mark of the same intelligence, but of *an* intelligence, and therefore, am not led into what is a very different and absurd conclusion;—I mean the one which Dr. Irons combated. This brings me to what Mr. Bunting said: we must here bring in the principles of ontology, and also the principles of logic; that when you have found a sufficient cause for a thing, there you can stop. I beg to remind you of what I said in my paper, that it was not my purpose to make out proof of a God from the evidence of a final cause in nature, but, putting aside difficulties which had arisen in the past, to indicate the line of direction which our thoughts must take if we are to retain this argument at all. I am very firm in the conviction that we must recover from the purely physical assumption of scientists—men for whom I have profound respect—we must recover for metaphysics certain terms which they claim as exclusively their own. They are not the only men who *know*. (Hear, hear.) I know, and one thing I know is that *I am*. And this is not a matter of external observation. My eyes have been deceived very much oftener than my conceptions have been mistaken. I maintain that it is a fact that I exist; as positive a fact as that the earth existed before me. There is a proper *science* of mind;—a science of facts and of laws. In this sphere we are to seek for Cause, behind all observable

causes, whether "mechanical," "material," "efficient," or however defined within the sphere of physics. And what we call probable reasoning is not at all inferior either to mathematical or to scientific or inductive reasoning, in force of conviction. In the practical affairs of life, in seven cases out of ten, we act upon moral conviction, and not upon knowledge which comes through the senses. We must maintain that there is no contradiction between these two lines or courses of evidence. If it be not immodest, I will say that, having given some thought to this matter, I have brought out in the January number of the *British Quarterly Review*, an essay on this whole question as to what is knowledge and science, and what is the true method of harmonizing religion with science, and to avoid trespassing upon your time, I beg leave to refer you to that for an answer to other questions proposed to me this evening. With all my heart I thank you both for the attention and courtesy with which you have listened to me, and for the kindly reception with which you have honoured me, and will only add how much I am honoured in finding myself a member of a body devoted to such noble aims. (Cheers.)

The meeting was then adjourned.

REMARKS UPON PROFESSOR HUXLEY'S "HUME"; BY
DR. THOMPSON.

SINCE the foregoing Paper was read, Professor Huxley has published a Life of Hume, with an analysis of his works, which in its cheap and attractive form may give a fresh impulse to the popularity of the Scotch philosopher. A review of Hume's philosophical system, as a whole, would here be out of place. Supposing Huxley's synopsis of it to be now at hand, I must restrict myself to the points raised in my paper—Cause, Power, Intuition. It is a hopeful sign that such a master in physics as Professor Huxley should invoke such a master in metaphysics as Hume (just as Prof. Tyndall invokes Lucretius) in support of his own teachings; that Science, which we have been told was the only knowledge—the knowledge of *things* by observation of the senses—should have recourse to Philosophy to sift and classify phenomena under *ideas*, in order that they may have a place in the category of knowledge. The necessity for this I have endeavoured to show in the article, "What is Science?" in the "British Quarterly Review" for January, 1879; and the recognition of this dependence of science upon philosophy for its own expression would put an end to much of the controversy over physics and metaphysics. As to ideal speculation, Professor Huxley goes quite far enough. On page 55 he says, "All science starts with hypotheses—in other words, with assumptions that are unproved, while they may be, and often are, erroneous; but which are better than nothing to the seeker after order in the maze of phenomena. And the historical progress of every science depends on the criticism of hypotheses, on the gradual stripping off, that is, of their untrue or superfluous parts, until there remains only that exact verbal expression of as much as we know of the fact, and no more, which constitutes a perfect scientific theory."

This statement of the way of attaining a scientific knowledge of external phenomena raises two questions, which must be answered before we can have any confidence in such knowledge. Who or what is it which makes that "criticism of hypotheses" upon which "the progress of every science depends"? And how do we "know a fact," or who are the WE who know a fact, so as to reduce it to its "exact verbal expression"?

Professor Huxley is not quite satisfied with Hume's negation of mind; that "what we call a mind is nothing but a heap or collection of different perceptions, united together by certain relations, and supposed, though falsely, to be endowed with a perfect simplicity and identity." Of this view, Huxley says, "He [Hume] may be right or wrong; but the most he, or anybody else, can prove in favour of his conclusion is, that we know nothing more of the mind than that it is a series of perceptions." Here, again, I ask, Who or what are the *We*, who know this, or anything else?

Does a mere "series of perceptions," each of which gives place in turn to its successor, know itself as a series, and that this series is all that can be known of mind? Has a series of ever-changing, ever-vanishing impressions a continuity of consciousness, a power of retention as memory, and of discrimination as judgment? There can be no criticism without comparison, without remembrance, without selection, without discriminating judgment; and the question forces itself home to the school of Hume, If the mind "is nothing but a heap or collection of different perceptions," where or what is that faculty which examines and compares these impressions, and which reduces them to an "exact verbal expression" as fact or knowledge? The truth is that Mr. Hume and Professor Huxley necessarily assume a *something* within man which, though it cannot be known "by direct observation," yet knows itself, and knows other things. The existence of this something, which we call mind, is asserted by the consciousness of all mankind and in the language of every people. It is proved by the consciousness which every man has of personal identity and of individuality; by his exercise of memory and of will; and above all by his sense of right and wrong, and his spontaneous emotions in view of good or of evil. This something knows itself as a Cause, as a Power, and as possessing free will; that is, in all actions having a moral quality it has power to choose a course of action and also power to choose the contrary. Whatever the motive which finally determines its choice—say, if you please, the greatest *apparent* good—there is always the power of contrary choice. Every man knows these things to be true of himself. But it is absolutely impossible to predicate any of these things of a mere "series of perceptions." Though the existence and the properties of mind may "lie beyond the reach of observation,"—as the term observation is applied to the study of nature,—yet the existence of mind is known in consciousness with a certainty as absolute as that which pertains to the phenomena of nature observed and reported through the senses. In either case the conviction of certainty is given in the mind, or it could not exist at all. How can I know anything if I do not first know the I who knows, so far as to have full confidence in the observations which *I* make, and in the judgments which *I* form?

Now, there are also truths which the mind knows by intuition, of which it is as certain as of any fact ascertained by observation, and indeed as certain as of its own existence. Such truths do not depend upon experience but are assumed in all experience. They could not be made a whit more clear or certain by reasoning or observation than they are seen to be by direct cognition. Of this class of truths are the axioms of mathematics. Hume admits that there are "necessary truths," but he would not class with these the axiom of causation, "That whatever event has a beginning must have a cause." Professor Huxley is more inclined to class causation with necessary truths, and this upon scientific grounds. Thus, on p. 121, he says, "The scientific investigator who notes a new phenomenon may be utterly ignorant of its cause, but he will, without

hesitation, seek for that cause. If you ask him why he does so, he will probably say that it must have had a cause; and thereby imply that his belief in causation is a necessary belief." What is true of the man of science is equally true of the human mind under all possible conditions. It is an intuitive conviction of a necessary truth, that every event must have a cause. It is absolutely impossible for the mind to conceive the contrary. Let any one conceive of absolute universal Nothingness and he will find it impossible to conceive of anything as beginning to be! Either, then, we must have recourse to the unphilosophical conjecture of an infinite series, or we must believe in an eternal Creator of the universe.

In like manner, that adaptation points to a purposing intelligence is an intuitive cognition of the human mind. This does not arise from experience of adaptive power in other men; and though continually verified by experience, it does not rest in experience for its proof. Here too, as above, it is impossible for the mind to conceive the contrary.

Having already exposed the fallacy of Hume on this point, and having traced the notions of causation and of power to their seat in the mind itself, I trust I have opened anew the way for the evidence of God in Nature, which physics is more and more unveiling, for metaphysics to take note of and classify.

The reader who is interested in the preceding points of metaphysical inquiry, but who lacks facilities for studying German philosophy in the original, can put himself in communication with two of the greatest thinkers of Germany, by reading *A Critical Account of the Philosophy of Kant*, by Professor Edward Caird, of the University of Glasgow; and *The Logic of Hegel*, by William Wallace, M.A., Fellow of Merton College, Oxford. Kant was not satisfied with the argument from design, or as it is better called, the physico-theological argument for the being of God; and while controverting Hume on some points, he agreed with him that the existence of order in the universe could at most establish a *finite* cause. This point I have considered on page 142. But another form of reply presented by Professor Caird is so thoughtful and suggestive that I give the gist of it here, referring the reader to the full argument in his eighteenth chapter.

"Why do we seek in things, in the world, and in ourselves, a truth, a reality, which we do not find in their immediate aspect as phenomena of the sensible world? It is because the sensible world as such is inconsistent with itself, and thus points to a higher reality. We believe in the infinite, not because of what the finite is, but quite as much because of what the finite *is not*; and our first idea of the former is, therefore, simply that it is the negation of the latter. All religion springs out of the sense of the nothingness, unreality, transitoriness—in other words, of the essentially negative character of the finite world. Yet this negative relation of the

mind to the finite is at the same time its first positive relation to the infinite. 'We are near waking when we dream that we dream,' and the consciousness of a limit is already at least the germinal consciousness of that which is beyond it. The extreme of despair and doubt can only exist as the obverse of the highest certitude, and is in fact necessary to it."

Hegel, who was fond of reducing every conception to the last possible analysis, says, "We must decidedly reject the *mechanical* mode of inquiry when it comes forward and arrogates to itself the place of rational cognition in general, and when it seeks to get mechanism accepted as an absolute category." He then shows how even the argument from design has been vitiated by a mechanical tone.*

"Generally speaking, the final cause is taken to mean nothing more than external design. In accordance with this view of it, things are supposed not to carry their vocation in themselves, but merely to be means employed and spent in realizing a purpose which lies outside of them. That may be said to be the point of view taken by Utility, which once played a great part even in the sciences. Of late, however, utility has fallen into disrepute, now that people have begun to see that it failed to give a genuine insight into the nature of things. It is true that finite things as finite ought in justice to be viewed as non-ultimate, and as pointing beyond themselves. This negativity of finite things, however, is their own dialectic, and in order to ascertain it we must pay attention to their positive content.

"Teleological modes of investigation often proceed from a well-meant desire of displaying the wisdom of God, especially as it is revealed in Nature. Now in thus trying to discover final causes, for which the things serve as means, we must remember that we are stopping short at the finite, and are liable to fall into trifling reflections. An instance of such triviality is seen, when we first of all treat of the vine solely in reference to the well-known uses which it confers upon man, and then proceed to view the cork-tree in connection with the corks which are cut from its bark to put into the wine-bottles. Whole books used to be written in this spirit. It is easy to see that they promoted the genuine interest neither of religion nor of science. External design stands immediately in front of the idea: but what thus stands on the threshold often for that reason gives the least satisfaction."

The burden of my paper is to lead up through this external design to the idea that lies behind it. And here Hegel has given food for thought in his profound saying that "Objectivity contains the three forms of Mechanism, Chemism, and the *nexus* of Design." This *nexus* holds the world and the universe together in our intuitive conception.

* Pages 291 and 299.