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than the wisdom and learning which are generally so conspicuous in the revision.

At some time after the Old Testament company shall have completed their revision a joint committee of both and, if possible, of the American companies also, should be appointed to review the work and give harmony and consistency to the whole. Let this committee, composed, of course, of the most honored and trusted men of all the companies, be authorized to make a final revision of the entire Bible. Such a committee would be a better working body than the companies, and, at the same time, as their representative would carry with it the weight, in some respects more than the weight, of the companies themselves. The Authorized Version was thus revised by a committee; why not the revision?

ARTICLE VIII.

THEOLOGICAL EDUCATION.

NO. IX. — PHYSICAL SCIENCE IN THE THEOLOGICAL SEMINARY.

SOME one has defined a cultivated man to be "a person who knows a little of a good many things and a good deal of one thing." The couplet of Pope warning us that a little knowledge is dangerous, and exhorting us to drink deep or taste not the Pierian spring is a half truth, and adapted to give much needless alarm. A little knowledge, provided it be real knowledge, and provided its relative amount be not over-estimated, is by no means an evil thing.

Modern science has indeed wrought great changes in the general methods of both work and study. Society is far more complex in its organization than it was before the invention of the steam-engine and the telegraph. The facilities for manufacture and commerce are now such that minute division of labor is necessary for success in business of almost every kind. A single city, or indeed a single firm, may now supply the demands of the world for some of the products of skilled labor. More frequently than in former times the merchant is compelled to limit himself to the purchase and sale of some one commodity, and the workman to the construction of a very small portion of the manufactured article upon which he labors. The narrowing tendency of modern industries was long ago made familiar by Sydney Smith's reference to the lot of those who spend their lives in

making the fifteenth part of a pin. The same tendency appears, also, to some extent, in the professions of law and medicine, and in all departments of physical science, where the work of investigation is falling more and more into the hands of men who have great special acquirements rather than wide, general information.

It is natural that the demands for special technical education should be felt in all training-schools; still, as has often been pointed out, there is great danger, even in the ordinary callings, of under-estimating the advantages of general culture to the technical student. But whatever may be best in preparation for other callings, it would certainly be a sad misfortune to narrow the range of preliminary study demanded of the Protestant ministry; for the permanent success of Protestantism depends in no small degree upon resisting the tendencies which would degrade the position of its clergy to that of mere specialists. There are, indeed, to be specialists in theological study, but their work is very different from that of the ordinary clergyman. Men who have a vocation for such study may shut themselves up in garrets for the purpose of carrying on extended historical or philological or philosophical investigations connected with theological truth. Such specialists supply with weapons of offence and defence the arsenals to which all theologians must resort for arms. But it is the business of clergymen as a class to mingle with men, and to be the mediators between the truth and the living spirits under their pastoral care. For full success in such work breadth of culture is always an imperative necessity. The clergyman should have points of contact with a great variety of minds. The influence of the Protestant minister is largely personal, and he must know how to enter into the thoughts of other men.

From this it is readily seen that some considerable knowledge of the physical sciences is demanded at the present time, if our clergymen are to be thoroughly furnished for their work. The pastor is sure to find within the bounds of his parish persons of intelligence and influence who from one cause and another have become estranged from the church, and who have been taught to depreciate the attainments of the ministry. To gain influence over such it is of the greatest importance for the clergyman to have some neutral ground upon which he may meet them, and labor with them intelligently for the promotion of some common philanthropic object. The church has heretofore gained no small part of its influence through the zeal of its clergy in promoting a love for music and art. In like manner science may now become the handmaid of religion; more, however, by indirect connection than by direct methods. The human mind is a vacuum that must be filled. In so far as the pastor can arouse his parishioners to an interest in scientific pursuits, he will crowd out the lower train of amusements, and leave more room for whatever is higher and more elevating. Far be it from the evangelical clergy to neglect this class of philanthropic endeavor.

Furthermore, no congregation is wholly free from the disturbing influence of "science falsely so called." The indiscriminate pronouncements of sciolists, and the fragmentary, and hence distorted, utterances of the scientific masters, float on every breeze, and are disseminated by all the mighty power of the platform and of the printing-press. The larger part of the conflict between science and religion arises either from a temporary misunderstanding of the facts of science or from a false interpretation of our real religious necessities and of the positive revelation made to satisfy them. Nevertheless, it cannot be denied that inductive science has profoundly modified the popular modes of thought upon some of the fundamental doctrines of Christianity.

Modern science has greatly limited the range of the phenomena looked upon as supernatural and restricted the things regarded as legitimate objects of prayer, and both enlarged and modified our conceptions of design in nature. In the end it has always appeared that there was no essential antagonism between progress in inductive discovery and the desired stability of the religious convictions of the Christian public. But while new theories have been unfolding themselves before the world there has usually been much needless disquietude and alarm. It was more than a century before devout believers could adjust their religious reflections to the idea of the earth's instability suggested by the Copernican hypothesis, and we are even yet scarcely reconciled to the long vistas of God's creative and previsionsal activity opened to our eyes in geology and physical astronomy. It will require more than one generation to settle the questions now at issue concerning the antiquity of man, and concerning his early condition and origin. The attempts of such writers as E. B. Tylor and Sir Henry Maine to throw light upon man's prehistoric condition by a comparative study of the language and customs of barbarous tribes cannot be safely ignored by the teacher of biblical theology; nor is it possible long to refute the arguments of Darwin by mistating his propositions. So difficult is it for men even of great attainments to master the theories and arguments of a collateral branch of inquiry, that the *professors of theology* themselves now need a well-versed scientific associate to mediate between them and the ever-increasing accumulations of well-established or probable inductive conclusions in physical science. *No theological faculty is perfect in itself without a scientific member.*

If this be so with the leaders in theological thought, how capital must be the mistake of sending out the young men who are about to undertake single-handed and in the remote portions of our land and the world the task of defending the Christian faith, without having had the advantages of such aid as the professorship of which we are speaking might give them during their preparatory training! How supreme the mistake of sending the young men of our theological seminaries to their work with an inadequate knowledge of the trains of thought uppermost in the minds of a

large number of their most intelligent hearers! A pretty extended knowledge both of scientific facts and of scientific modes of thought our pastors must have, or Protestantism, like Catholicism, breaks with the progress of the age.

It is not to be expected, however, that all the responsibility for this training is to be thrown upon the theological seminary. A part of it rests with the primary and intermediate schools, whose business it is to teach by object lessons the elementary facts of botany; mineralogy, geology, and chemistry. A part of this responsibility rests with the college, which should allow no candidate for the ministry to leave its halls till he has been instructed in the broader principles of classification in all the sciences. It is necessary to say this much concerning the preparatory schools, in order to prevent a calamity which might befall us if the appointment in our theological seminaries of professors upon the relations of science to religion were understood to be for the purpose of giving elementary instruction in science. The design of such a professorship is not to relieve the preparatory schools, but to supplement their work, and to keep both the associated theological professors and their students in living sympathy with the progressive scientific thought of the age.

It is possible that those theological seminaries which are connected with a college or university do not have the same need of a special professorship of the relations of science and religion as those have which are isolated; since the ordinary professors in the scientific departments of a university may have such relations to both the theological faculty and the theological students that nothing more is needed. There are, however, many practical difficulties in the way of a theological school's depending upon a co-ordinate department for its scientific stimulus and instruction. The application of science to a theological seminary is not the work of a *general* practitioner, but of one who makes the theological bearing of discoveries his special study. This neither the investigator in a university nor the ordinary professor in a college can often be expected to do.

One of the important results to be secured by a professor of science in a theological seminary is negative in its character. The wisdom of a preacher may be shown by his well-considered silence. It may not be necessary to speak much or often from the pulpit upon science, but it is important that when one does speak his words be sound and judicious. There is a constant tendency to over-estimate the importance of newly discovered facts and of freshly propounded and plausible theories. The haste with which some clergymen attack scientific theories which seem antagonistic to faith, or adopt them when they appear to corroborate the Bible, often brings great discredit upon the truth. It is important to base our proof of the Christian faith upon those arguments that are *most* cogent. The perspective which the preacher gives to the truths upon which our belief in Christianity rests is all-important. The Christian minister is to

covet earnestly the best arguments, and, possessing them, to present them to his people with a frequency and emphasis corresponding to their relative value.

Sciolism is especially to be avoided in the pulpit. The man who takes a flower or a bit of musk, and attempts to evolve therefrom a cogent argument for the immortality of the soul; or who from a sunbeam or the sonorous emissions of a tuning-fork elaborates principles which are to serve as corner-stones for his theory of the universe; or who catches the chirp of a cricket and attempts to draw from it a demonstration of the falsity of materialism, may be a genius of such calibre as to make his subject sublime; but he runs great risk of making it ridiculous to his more thoughtful auditors. Access to and contact with a man of large scientific attainments and of sound judgment during their theological course would do much to repress the tendency, too manifest among clergymen, of resorting to superficial analogies and far-fetched theories for their arguments in proof both of natural and revealed theology.

Another important end to be secured by the presence of a scientific professor in a theological seminary relates to the advancement of science. Clergymen enjoy peculiarly favorable opportunities for making discoveries in some departments of investigation, and thus for adding to the general stock of human knowledge. This is singularly true with reference to the sciences of botany, zoölogy, geology, anthropology, and language. In each one of these departments of study every district presents peculiar problems calling for the special attention of a local observer. What class of men can there be better situated than the clergy for prosecuting these much-needed investigations? The preacher of the gospel goes wherever man is found. He is by virtue of his occupation given to thought and reflection, and he needs the recreation which such incidental pursuits bring to the weary mind.

It is to the lasting credit of the clergy that science owes them already so great a debt. It was a Roman Catholic priest (Rev. J. MacEnery), who discovered, and first perceived the archaeological importance of the human implements found in the cave at Kent's Hole in South-western England. The Catholic Abbé Bourgeois has performed a similar service for the archaeological fragments found at St. Prest in France. So eminent did J. Pye Smith of England and President Hitchcock of Amherst become as geologists that the world has well nigh forgotten their zeal and success in their chosen calling as preachers of the gospel. The student of glacial phenomena is made almost as familiar with the name of Canon Mozley for his investigations into the characteristics of ice movements as the theologian is through the theological publications bearing that distinguished name. According to the testimony of Professor Dana, an obscure Congregational minister in Western Vermont (the Rev. A. Wing, now deceased) did more by a judicious employment of his vacations to solve

the vexed but important questions relating to the geology of the region in which he lived than was accomplished by the expensive professional survey provided by the State. More recently a Lutheran clergyman in Ohio has through his familiarity with his own locality made most important and interesting discoveries in palaeontology. The comprehensive knowledge of the state geologist was essential to a full understanding of the significance of the discoveries, but except for the clergyman's scientific predilections and his minute knowledge of local facts, the secrets of nature might never have been disclosed. The meteorological discoveries of the Rev. T. D. Stoddard while a missionary in Persia drew forth warm expressions of gratitude from the great astronomer Herschel. Carl Ritter pays the highest compliments to the *Missionary Herald* as a repository of geographical information, and declares that he could not have written his "Erdkunde," except for the material transmitted to him by missionaries. The botany, zoology, and topography of South Africa had a flood of light shed upon them by the essays of the cultured missionary Champion in the *American Journal of Science*. The zoological specimens from Western Africa, with which more than one museum in this country are supplied, bear witness to the scientific zeal of Rev. William Walker; and the contributions of Rev. E. Burgess to the *American Association for the Advancement of Science*, shed much light upon the geology of the Cape of Good Hope. The geology of Persia is under similar obligations to the Rev. Justin Perkins; while the missionaries to the Sandwich Islands have been the guardians of Mauna Loa. To give an adequate account of Livingstone's contributions to science would require volumes. In the study of language the service of missionaries has been indispensable. More than two hundred languages have been reduced by them to writing, and the peculiarities of as many dialects brought within reach of the students of comparative philology at the great seats of learning. The late Bishop Pattison of the South Sea Islands was one of the most valued correspondents of Max Müller. We are told that the Ethnological Society in New York rarely holds a meeting in which papers from missionaries are not read. If without organized effort so much has been done by clergymen towards enlarging the boundaries of scientific knowledge, what might not the results be if there were in each prominent theological seminary a thoroughly equipped scientific professor who should make it a part of his business to stimulate and direct such work! Blessings innumerable shall rest upon the heads of those thoroughly furnished professors of science and religion who shall hereafter sit in our seats of theological learning, and shall bring themselves into loving sympathy with our candidates for the ministry, and shall consider with them their various fields of labor, and direct the attention of the young men to the scientific problems which can best be studied in their several places of settlement. The labors of the pastors of the large city churches may be so arduous, their

salaries so generous, and their opportunities for vacations so abundant that they will feel little need of such sympathy and direction; yet even they would find more satisfactory recreation in the pursuit of science than in shooting small birds and adding to the persecutions of diminutive trout. It will be of more than scientific interest if some clergyman would identify the ledge from which came the boulder at Plymouth, Mass., upon which the Pilgrims are said to have landed.

But especially serviceable to the clergymen settled on small salaries in the retired parishes of the country, to the home missionaries bearing the hardships of the frontier, and to the foreign missionaries laboring in the distant portions of the earth, the professor of physical science as related to theology may be of signal advantage. He will help them to break the monotony of their daily labor by well-directed effort in some scientific avocation, and will be of assistance to them in bringing their observations before the scientific world. In this manner, though not serving the highest of all purposes, he will do what may well satisfy the ambition of no ordinary man. He will confer an inestimable favor upon the hard-worked and poorly-paid portion of our clergy; he will in the eyes of the world add dignity to the pastoral calling, and he will greatly increase the stock of human knowledge. The ministers and missionaries from a single theological seminary are far more numerous, and more widely scattered than the officers of the United States Signal Service. With concerted effort how might they enrich the world's repertory of scientific facts, and add to the advantages and give lustre to the name of their alma mater, while increasing the dignity and influence of the whole profession of which they are members.

G. F. W.

[The preceding Article confines itself to the Relation of Theology to *Physical Science*, because Articles have already appeared in the *Bibliotheca Sacra* on the Relation of Theology to other Sciences. See especially *Bib. Sac.*, Vol. xxxiii. pp. 288-292.]