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ON
SCIENCE
AND
REVELATION.

BY
PROFESSOR ^hG. G. STOKES, P.R.S. ^{SL}

BEING THE PRESIDENTIAL ADDRESS DELIVERED AT THE
ANNUAL MEETING OF THE VICTORIA INSTITUTE.

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CAJORI

THE ANNUAL ADDRESS

OF

THE VICTORIA INSTITUTE.

BY

PROFESSOR G. G. STOKES, P.R.S.

ON the present anniversary, which is the conclusion of my first year of office as President of this Institute, I propose to address a few words to you bearing on the object of the Institute, and on the spirit in which, as I conceive, that object is best carried out.

The highest aim of physical science is, as far as may be possible, to refer observed phenomena to their proximate causes. I by no means say that this is the immediate, or even necessarily the ultimate, object of every physical investigation. Sometimes our object is to investigate facts, or to co-ordinate known facts, and endeavour to discover empirical laws. These are useful as far as they go, and *may* ultimately lead to the formation of theories which in the end so stand the test of what I may call cross-examination by Nature, that we become impressed with the conviction of their truth. Sometimes our object is the determination of numerical constants, with a view, it may be, to the practical application of science to the wants of life.

To illustrate what I am saying, allow me to refer to a very familiar example. From the earliest ages men must have observed the heavenly bodies. The great bulk of those brilliant points with which at night the sky is spangled when clouds permit of their being seen, retain the same relative positions night after night and year after year. But a few among them are seen to change their places relatively to the rest and to one another. The fact of this change is embodied in the very name, planet, by which these bodies are desig-

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nated. I shall say nothing here about the establishment of the Copernican system: I shall assume that as known and admitted. The careful observations of astronomers on the apparent places, from time to time, of these wandering bodies among the fixed stars supplied us, in the first instance, with a wide basis of isolated facts. After a vast amount of labour, Kepler at last succeeded in discovering the three famous laws which go by his name. Here, then, we have the second stage; the vast assemblage of isolated facts are co-ordinated, and embraced in a few simple laws. As yet, however, we cannot say that the idea of causation has entered in. But now Newton arises, and shows that the very same property of matter which causes an apple to fall to the earth, which causes our own bodies to press on the earth on which we stand, suffices to account for those laws which Kepler discovered—nay, more, those laws themselves are only very approximately true; and, when we consider the places of the planets, at times separated by a considerable interval, we are obliged to suppose that the elements of their orbits have slowly undergone slight changes. But the simple law of universal gravitation, combined, of course, with the laws of motion, not only leads to Kepler's laws as a very close approximation to the actual motions, but also accounts for those slight changes which have just been mentioned as necessary to make Kepler's laws fit observation exactly. We are inevitably led to regard the attraction of gravitation as the *cause* which keeps the planets in their orbits.

But it may be said, what is the difference in the two cases? Is not the law of gravitation merely a simpler mode of expressing the observed facts of the planetary motions just like the somewhat less simple laws of Kepler? What right have we to introduce the idea of causation in the one case more than in the other?

The answer to this appears to be that in the one case, that of Kepler's laws, supposing them to be true, we have merely a statement of what, on that supposition, would be a fact regarding the motions of the planets, whereas in the other case the observed motions are referred to a property of matter of the operation of which in other and perfectly different phenomena we have independent evidence.

I have purposely omitted to mention the important difference between the two cases, which lies in the circumstance that Kepler's laws require correction to make them applicable to long intervals of time, whereas the law of gravitation shows no sign of failure; because, even if the former had been perfectly exact, however long the interval of time to which

they were applied, I doubt if they would have carried with them the idea of causation.

To take another simple illustration, let us think of the propulsion of a bullet in an air-gun. We speak of the motion of the bullet as being *caused* by the elasticity of the compressed air. And the idea of causation comes in because we refer this particular instance of motion to a property of gas, of the existence and operation of which we have evidence in perfectly independent phenomena.

It is thus that in scientific investigation we endeavour to ascend from observed phenomena to their proximate causes; but, when we have arrived at these, the question presents itself, can we in a similar manner regard these causes in turn as themselves the consequences of some cause stretching still further back in the chain of causation? If the motion of the bullet in an air-gun be caused by the elasticity of the compressed air, can we account for the elasticity of a gas? If the retention of the planets in their orbits be due to the attraction of gravitation, can we explain how it is that two material bodies should attract one another across the intervening space?

Till a time well on in the present century, we could only take the elasticity of gases as a fact, and deduce the consequences which flow from it. But the researches of Joule and Clausius and Maxwell and Crookes and others have accumulated so much evidence in favour of the general truth of the kinetic theory of gases, that we are now disposed not to rest in the elasticity of gases as an ultimate property beyond which we cannot go, but to regard it as itself a consequence of the molecular constitution of bodies, and of the motions and mutual collisions of the ultimate molecules of a gas. Respecting the attraction of gravitation we have not at present made a similar advance. Speculations, indeed, have not been wanting on the part of those who have endeavoured to account for it. But none of these so fits into the known phenomena of Nature as to carry with it a conviction of its truth. Yet there is one indication that though we cannot at present explain the cause of gravitation, yet it *may* be explicable by what are called second causes. The mass of a body is measured by its inertia; and, though we commonly think of a body of large mass as being heavy, and though we compare the masses of two bodies most easily and accurately through the intervention of weight, yet the idea of mass may be acquired, and means might easily be suggested by which the ratio of the masses of two bodies might be experimentally determined, without having recourse to gravi-

tation at ali. Now, according to the law of gravitation, the force with which a given body attracts another at a given distance is strictly proportional to the mass of the latter. If we suppose the attracting body to be the earth, and the attracted bodies to be in one case a brass weight, and in the other a piece of marble, it follows that if they make equilibrium when placed in the pans of a true balance—I make abstraction of the effect of the buoyancy of the air—their masses are strictly equal, and, accordingly, that weight is a true measure of mass. But there is no reason *a priori*, so far as with our present knowledge we can see, why this should be so. We know that if the bodies in the scale-pans were formed, one of brass and the other of iron, and there were a magnet concealed under the table on which the operator placed his balance, the masses would not be equal when there was equilibrium. But that the law is true, and that, accordingly, weight is a true measure of mass, follows with the highest probability from the third of Kepler's laws, and was proved experimentally by Newton, by experiments with pendulums. Newton's experiment has since been repeated by Bessel, with all the refinements of modern appliances, with the result that so far as the most exact experiments enable us to decide the law is strictly true. This is perhaps the only instance, as Sir William Thomson remarked to me in conversation, in which there is an exact agreement between two quantities, and yet we are unable to give any reason why they should agree. That such is the case, holds out some prospect of scientific men being able some day to explain gravitation itself—that is, to explain it as the result of some still higher law.

Such is the nature of our progress in scientific investigation. We collect facts; we endeavour to co-ordinate them and ascertain the laws which bind them together; we endeavour to refer these laws to their proximate causes, and to proceed step by step upwards in the chain of causation. Presently we arrive at a stage at which, even after long trial, we do not see our way to going further. Yet we are not able to demonstrate that further progress in the same direction, that is along the chain of secondary causation, is impossible. Science conducts us to a void which she cannot fill.

It is on other grounds that we are led to believe in a Being who is the Author of Nature. A conclusion so important to mankind in general is not left to be established as the result of investigations which few have the leisure and ability to carry out. Doubtless, where it is accepted, the study of

science enlarges our ideas respecting the greatness of that Being, and tends to keep in check notions of too anthropomorphic a character which we might form concerning Him. Still, the subject-matter of scientific study is not, at least directly, theistic, and there have not been wanting a few instances of eminent scientists who not merely rejected Christianity, but apparently did not even believe in the being of a God.

The religious man, on the other hand, who knows little or nothing of science, is in the habit of contemplating the order of Nature not merely as the work of God, but in very great measure as his *direct* work. Of course, the concerns of everyday life present innumerable instances of the sequence of cause and effect; and few are now so ignorant of the very elements of science as not to allow that the sequence of day and night, of summer and winter, is proximately due to the rotation of the earth about its axis, and the oblique position of that axis with reference to the plane of the earth's orbit. But when we get beyond the region of what is familiarly known, still more, when we get outside the limits of well-ascertained scientific conclusions, and enter a region which is still debatable ground, where men of science are attempting to push forwards, and are framing hypotheses with a view to the ultimate establishment of a theory in case those hypotheses should stand the test of thorough examination; when, I say, we get into this region, a man such as I have supposed may feel as if the scientists who were attempting to explore it were treading on holy ground; he may mentally charge them with irreverence; perhaps he may openly speak of them in a manner which implies that he attributes to them an intention to oppose revealed religion.

To take a particular example. I can imagine that a man such as I have supposed may have always been in the habit of regarding each one of the thousands and tens of thousands of species into which naturalists have divided the animal and vegetable kingdoms as having originated in an independent creative act; that the supposition may have become entwined among his religious beliefs. Such a man would be apprehensive of any attempt to introduce second causes in explanation of the observed fact of the great multiplicity of species.

Akin to the feeling which I have attempted to describe is another, against which we must be on our guard. The religious man is strongly impressed with the truth of certain things which lie outside the discoveries of reason or the investigations of science, and which bear on the whole conduct of his life here, and on his hopes regarding a life hereafter. He

believes these truths to be divine, and, accordingly, that no legitimate deduction of human reason is liable to come in conflict with them. But the precise mode in which a conviction of the truth of these things was arrived at depends, to a considerable extent, on each man's idiosyncrasy. His natural bent of mind, his early training, his later associations, have all a good deal to do with it. Divine truth is one thing; our own apprehension of it, and the steps by which in our own minds it has been arrived at, are another. These are liable to human imperfection, and we may not attribute to them the infallibility which belongs to that which is divine. We are not to confound the scaffolding with the building; nor, if we are anxious for the safety of the edifice, need we therefore fear that, if the scaffolding were tampered with, the whole might come tumbling down, nor should we regard as a dynamiter a fellow-workman who would remove a pole or two.

That truth must be self-consistent, come from where it may, is an axiom which nobody would dispute; the only question can be, What is truth? Now, there are truths which we know by intuition, such as the axioms of mathematics; and there are others, again, which, though we do not perceive them by intuition, yet demonstrably follow from what we do so perceive; such, for example, are the propositions of mathematics. Then there are other conclusions which we accept as the result of the application of our reason to a study of Nature. Here the evidence is not demonstrative, and the conclusion may have all degrees of support, from such overwhelming evidence as that on which we accept universal gravitation, to what hardly raises the conclusion above the rank of a conjecture. On the other hand, there are conclusions which we accept on totally different grounds, namely, because we think that they have been revealed. Why we accept a revelation at all, is a very wide question which I cannot here enter into. That we do accept it is implied in the membership of this Institute. But, granting the acceptance of revelation, the question remains, What and how much is involved in revelation? That is a question respecting which there are differences of opinion among those who frankly accept a revelation, and with it the supernatural.

Now, the primary object of the establishment of the Victoria Institute was to examine questions as to which there was a *primâ facie* appearance of conflict between the conclusions of science and the teachings of revelation. In order that such examination may be usefully carried out, it must be undertaken in a thoroughly impartial spirit, with a readiness honestly to follow truth

wherever it may lead. It will not do to assume that the immunity from error which belongs to the divine belongs also to our apprehension of what constitutes the divine, and that therefore, if a conflict there be, the error must be on the side of science. It is true, that many statements which are really little more than scientific conjectures are represented, at least by those who take their science at second or third hand, as if they were the well-established conclusions of science. But it is true also that the progress of science has corrected the assertions of a crude theology. We are disposed nowadays to smile at the idea of any opposition between the Copernican system and the teaching of revelation; but we need not go back to the days of the persecution of Galileo to find an example of a well-supported scientific conclusion having met with a similar opposition, issuing in a similar result.

To gauge thoroughly the amount of evidence on which an asserted scientific conclusion rests, one ought to be well acquainted with the branch of science to which it relates. Still one can get a fair general notion of the evidence by an amount of reading which is by no means prohibitive, or by conversing with those who have made that branch a special study. It may be that the impression thus left on the mind will be that the votaries of science, carried away by an excess of zeal in the attempt to discover the causes of natural phenomena, have really, though honestly, overestimated the evidence. It may be, on the other hand, that the inquirer will perceive the evidence to be weighty and substantial, in which case it behoves him to reconsider the supposition with which he started, that the conclusion was opposed to the teaching of revelation.

One should always bear in mind the great responsibility one incurs, and the mischief one may do, by representing as bound up with revelation that which really forms no part of it. Being by hypothesis no part of it, but only erroneously tacked on to it, it may be false, and being false, it may be in opposition to a conclusion supported by the weightiest evidence, it matters not of what kind, but say scientific. What then, will be the effect of the error committed by the upholder of revelation? The educated man of science may see through the fallacy; but will it not put a weapon into the hands of the infidel lecturer wherewith to attack revealed religion?

But whether we can agree or cannot agree with the conclusions at which the scientific investigator may have arrived, let us, above all things, beware of imputing evil motives to him; of charging him with adopting his conclusions for the purpose of opposing what is revealed. Scientific investigation is

eminently truthful. The investigator may be wrong, but it does not follow that he is other than truth-loving. If on some subjects which we deem of the highest importance he does not agree with us—and yet it may be he agrees with us more than we suppose—let us, remembering our own imperfections, both of understanding and of practice, bear in mind that caution of the Apostle: “Who art thou that judgest another man’s servant? To his own master he standeth or falleth.”

NOTE.

The following remarks by Professor G. G. Stokes, P.R.S., were delivered by him on another occasion, and their insertion here seems not inappropriate:—

“We all admit that the book of Nature and the book of Revelation come alike from God, and that consequently there can be no real discrepancy between the two if rightly interpreted. The provinces of Science and of Revelation are, for the most part, so distinct that there is little chance of collision. But if an apparent discrepancy should arise, we have no right, on principle, to exclude either in favour of the other. For however firmly convinced we may be of the truth of revelation, we must admit our liability to err as to the extent or interpretation of what is revealed; and, however strong the scientific evidence in favour of a theory may be, we must remember that we are dealing with evidence which, in its nature, is probable only, and it is conceivable that wider scientific knowledge might lead us to alter our opinion. We should be ready to hear the whole of the evidence, and judge honestly from the whole. We should admit the principle of hearing both sides; not that we should each make the examination, for comparatively few would be competent to do so.

“It is impossible for the bulk of our population, whose lives are spent in earning their daily bread, to weigh the evidence of what are stated to be the conclusions of science. They take them on trust, if they attend to them at all; and if scientific conjectures are represented to them as the conclusions of science, they are predisposed to accept them as such from the general knowledge they possess of the great things that science has done. It is quite possible that a stumbling-block may thus be placed in the way of religious belief; for though our fundamental idea of the unity of truth involves, as an axiom, the absence of antagonism between real science and revelation, we have no such guarantee respecting scientific conjecture.

“As the dangers referred to arise from a separation of Science from Revelation, and a determination to ignore one of these two modes of arriving at truth which are open to man, it follows that they are best guarded against by a hearty recognition of both, as coming, in different ways, from the Author of our being.”

APPENDIX I.

EXTRACT FROM THE PREFACE OF VOLUME XVIII.

(“*Journal of Transactions*” of the *Victoria Institute*.)

“The title of Professor G. G. STOKES, F.R.S., paper ‘On the Absence of Real Opposition between Science and Revelation’ (contained in this volume), is in itself a protest against that thoughtless cry to which so many outside the Institute are found to give utterance: the paper coming as it does from one who ranks second to none in the scientific world, demands special notice; it has been supplemented by remarks and contributions from Sir J. Risdon Bennett, F.R.S.; Professor Lionel S. Beale, M.D., F.R.S.; Sir J. W. Dawson, LL.D., K.C.M.G., F.R.S.; Sir Joseph Fayrer, M.D., K.C.S.I., F.R.S.; and others. To these authors and to others who have taken part in the discussion of the subjects treated last session, the best thanks of the Members and Associates are due. They have sought to carry on their investigations strictly on the lines of the Institute; searching for the actual philosophical or scientific truth on all questions; and where any question bearing on Holy Scripture, and which had been turned against it, has been examined, impartial inquiry has been of signal service in elucidating the truth on the subjects treated.”*

“The mention of this subject induces a reference to a statement which has often been made of late by the opponents of *all* religious teaching, namely, that the progress of Science has given a death-blow to all belief in the truth of the Bible, and that men of Science no longer regard that book or the religious belief it inculcates. So strange a statement might not be worthy of notice, but that it has been credited even by some charged with the regulation of education both at home and in our Colonies. Such a fact is an additional reason for the earnest efforts of every Member for the advancement and extension of the influence of this Institute, for surely only ignorance of the true results of scientific inquiry can tend to make belief in such a statement possible.”

* “That this is the true way of reconciling apparent discrepancies between Christianity and Science was urged by the Institute’s leading founder, in a Pamphlet, on ‘The True Character of the Institute,’ in which he says:—‘I would beg leave to adopt the prudent language employed by Canon Tristram, F.R.S., before the British Association at Bath, in 1864, when reading his valuable paper ‘On the Deposits in the Basin of the Dead Sea.’ He said he had a dread of attempting to corroborate Scripture by natural or physical arguments which may be refuted; for the object is apt to think that, when he has refuted the weak argument, he has refuted the Scriptural statement.’”

APPENDIX II.

FROM THE ANNUAL ADDRESS

By (the late) R. MAIN, M.A., F.R.S., F.R.A.S.

(RADCLIFFE OBSERVER.)

“ Let me offer my congratulations to the Society on its present position and prospects, and on the increasing consideration and respect with which its operations are regarded by men capable of judging. It has attracted to itself representatives in the various departments of science, well capable of defending the faith from the attacks of scientific scepticism, and standing so high in their several departments of science or literature, that their opinions *must* be received with attention and respect. No one also could, I conceive, deny that the philosophical character of the Society has been most severely maintained in all its papers and discussions, and that every theory opposed to the belief of the ordinary Christian philosopher has been treated with the most scrupulous fairness and respect. Personalities have been altogether avoided, and an example has been set of the proper way of conducting such controversies, which will, we may presume, have considerable influence for the avoiding of bitterness and unfairness for the future.”



The Victoria Institute,

or

Philosophical Society of Great Britain,

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Correspondence (including communications from intending Members or Associates, &c.) to be addressed only to "The Secretary."

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First.—To investigate fully and impartially the most important questions of Philosophy and Science, but more especially those that bear upon the great truths revealed in Holy Scripture.

Second.—To associate MEN OF SCIENCE and AUTHORS* who have already been engaged in such investigations, and all others who may be interested in them, in order to strengthen their efforts by association ; and by bringing together the results of such labours, after full discussion, in the printed Transactions of an Institution, to give greater force and influence to proofs and arguments which might be little known, or even disregarded, if put forward merely by individuals.

Third.—To consider the mutual bearings of the various scientific conclusions arrived at in the several distinct branches into which Science is now divided, in order to get rid of contradictions and conflicting hypotheses, and thus promote the real advancement of true Science ; and to examine and discuss all supposed scientific results with reference to final causes, and the more comprehensive and fundamental principles of Philosophy proper, based upon faith in the existence of one Eternal God, Who in His wisdom created all things very good.

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* The Society now consists of 1,200 Subscribers (about one-third of whom are Foreign Members); including Literary and Scientific Men and others favourable to the Objects. (The present average annual increase is upwards of a hundred.)

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78. On Agnosticism. By J. HASSELL, Esq. On the Structure of the Gorilla. By E. CHARLESWORTH, Esq., F.G.S.; with illustration. Notes on the Antiquity of Man. By the EDITOR. The Chronology of Animal Life on the Earth prior to the Advent of Man. By Sir J. WILLIAM DAWSON, K.C.M.G., F.R.S., President of the British Association. Historical Evidences of the Migration of Ahrail. By W. ST. C. BOSCAWEN, F.R. Hist. Soc., with drawings. Notes by Professor SAYCE, E. A. W. BUDGE, Esq., &c. A Sennian Tradition of Creation. Rev. T. POWELL, F.L.S. (the late); Notes on the Islands.
79. The Fundamental Assumptions of Agnosticism. By Rev. H. J. CLARKE. On Miracles. By Rev. H. C. M. WATSON. Remarks by Lord GRIMTHORPE, &c. On Accounts of the Creation. By W. P. JAMES, Esq., F.L.S. (the late).
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On Cuts on Bone as evidence of Man's Existence in remote ages. By Prof. T. MCK. HUGHES, F.R.S. Remarks by Prof. RUFERT JONES, F.R.S., Prof. A. S. WOODWARD, F.G.S., Rev. J. M. MELLO, M.A., F.G.S., &c.
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THE VICTORIA INSTITUTE.

Founded 1865.

ITS OBJECT.

THE Institute was founded to investigate, fully and impartially, the most important questions of Philosophy and Science. In cases where any such questions have borne on the great truths of Revelation, and been used against them by those who have assumed opposition to exist between Science and Revelation, full and impartial investigation by those competent to undertake it, has been found of the utmost value, as it has tended to prove that there was an absence of such opposition:—it should be added that the Institute has not aimed at corroborating Scripture by natural or physical arguments, which might be refuted (as the objector is apt to think that when he has refuted the weak argument he has refuted the Scripture statement).

With a view to carrying out its objects effectually, the Institute has sought to associate the most eminent men of Science and authors resident in all parts of the world, and to combine their efforts in the work, and it has the advantage of having for its President one who has long been the President of the Royal Society. Papers are prepared and considered by its Members, and other men of Science who may not be Members are also invited to co-operate in so doing; and the results are published in its "Journal of Transactions."

By careful organisation the Institute is able to afford to country and foreign Members facilities for expressing their opinions upon the papers brought before the Institute, prior to their publication, and also to make the existence of the Institute as useful as possible to all its Members, whether home or foreign.

The Institute has a Library of Reference, and the books are lent out. Members desiring to lecture in their neighbourhoods, on subjects connected with philosophical or scientific questions, especially such as the Institute's main object refers to, are supplied with information and the names of the standard works upon the subjects.

On some Special Uses made of the Institute by its Members

The Victoria Institute has been found to meet a need felt both at home and abroad, especially in our Colonies and India, where the want of a true appreciation of the actual results of scientific inquiry has led many, especially the less informed, to

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credit such statements as that "Science and Philosophy were alike opposed to Revelation," and that "the progress of Science has given a death-blow to all belief in the truth of the Bible." (As one result of this, the Bible is a forbidden book in many a Board School at home and in our Colonies). Under the Victoria Institute's present organisation, its Members, both at home and in other parts of the world, find themselves now able to make use of the results of the Institute's investigations to dispel such erroneous ideas. The thought of so utilising the Institute originated with its country and Colonial Members: and those desiring to do so have used the papers in the Journal as lectures, or to lecture from, in their respective localities, or have corresponded with the Institute as to the preparation of such lectures—have reprinted portions of the Journal in foreign and Colonial journals—have published translations of its papers (in many countries)—and have got Local Associations and Public Libraries to subscribe for the Journal.

The Institute consists at present of 800 home and 500 foreign and colonial Members and associates, being men of science, authors, and others, who have desired to support it.

Further information will be found in the Institute's "Objects Paper."

Address of the Institute—

8, ADELPHI TERRACE,
NEAR CHARING CROSS, LONDON.

SPECIAL AND PRIVATE. Summary to July, 1891.

To members

The advance of the Institute is maintained both at home and abroad. The steady and cordial support which both Members and Associates have accorded, and the personal interest they have taken in the Institute's welfare, have given strength and solidity to its work; while the remarkably few retirements, and the several cases of old Members desiring to rejoin, are very gratifying, and prove how fully all realise the desirability of making use of the present opportunities of advancing a Society the value of whose aims is increasingly recognised by all thoughtful men.

As regards the Institute's Philosophical and Scientific Investigations the Council are much gratified to be able to report that the number of leading men of Science who are either joining the Institute, or kindly aiding its work by taking part in the proceedings, by writing Papers, or aiding in their discussion, is constantly increasing, thus giving increased value to the transactions.

Among the subjects taken up of late:—

Lord Grimthorpe gave a paper on "Human Responsibility."

At the 1891 Annual Meeting, Dr. E. Naville, the discoverer of Pithon and Bubastis, gave an Address, in which he described his Researches, referring to the position of certain Biblical sites hitherto undiscovered, especially some throwing further light upon the route of the Exodus, and in the search for which he had been most successful. M. Naville's paper came third in order of a series of three papers of the highest value, the first being one by Professor E. Hull, LL.D., F.R.S., "On the Geological History of Egypt," from the time when almost the whole of the northern part of Africa, including Egypt and the Isthmus of Suez, were the bed of the sea, until the time when the land had attained its present conformation, illustrating his subject by referring to his own explorations. Professor T. Rupert Jones, F.R.S., and others added to the value of this paper.

[Professor Hull also gave a paper on "God in Nature."]

Sir J. William Dawson, LL.D., F.R.S., gave a paper carrying Professor Hull's investigation into historical times, describing the minerals and metals existing, and the use they had been put to, the light they threw on the intercourse of nations in ancient times, &c. A large number of geologists took part in the discussion on this paper.

Dr. Guppy gave a paper "On the Dispersal of Plants," being an investigation into the laws under which vegetation has spread on the earth. Mr. Murray, of the *Challenger* expedition, and other explorers, complimented Dr. Guppy on the value of his researches, the results of which up to July, 1891, are reported in the Journal.

Professor Legge, Professor of Chinese at Oxford, and Sir Monier Williams, K.C.I.E., gave papers of very special importance.

Surgeon-General C. A. Gordon, C.B., gave a paper "On the Ancient Records and Philosophies of India."

The Rev. J. Neil gave a paper "On some Ancient Eastern Laws," in considering which the Lord Chancellor (Vice-President) took part.

Papers on "The Latest Assyrian Discoveries," "Agnosticism," "Deontology," "The Apparent Cruelty of Nature," and others, were also considered.

A translation of Professor Virchow's remarkable address referring to Man's Place in Nature, has been added to Vol. XXIV.

The foregoing indicates some of the work of investigation during the year, work which has been so helpful in causing the recession of controversy between Science and Revelation.

The system under which papers are read, and the discussions and comments thereon published, now enables Members in the most distant parts of the world to contribute papers, and to take part in the discussions, and it is the constant earnest aim of the Council, considering the Institute's high objects, that the work done, the papers, and the communications thereon, shall be of real value. As an evidence of the value set upon the Journal, the Council finds translations of the papers therein made in many parts of the world, including India, Japan, South America, Spain, Portugal, Italy, and now they are to be made in China.

Correspondence from every part of the world shows the necessity for making the Institute more widely known, and refers to the great value set upon its Journal, which is largely used to lecture from, especially where a want of a true appreciation of the actual results of scientific inquiry has led people to believe that science and religion were opposed.

Last year the Council pointed out that Membership of the Victoria Institute is far more than a mere personal advantage. For every Member, or Associate who joins, even if he be not able to give active help in its proceedings, at least increases the Institute's efficiency.

The Special Fund.—This is used for the needed improvements in the Library of Reference, and to forward the publication of the people's edition of twelve papers, especially in India, from whence the Institute receives constant applications urging the necessity of having the papers, and in China.

The Journal.—The fact that a hundred Members now receive the Journal in the Annual bound volume for every *one* that did so formerly, makes it desirable to state that all can have the Annual bound volume instead of the four Quarterly "parts," on expressing their wish to that effect. [Members can have the "parts" handsomely bound into volumes, free of all cost, on applying to the Institute.]

A Special Committee has been appointed with a view to further promoting the efficiency of the Institute's work; they are now arranging for papers and discussions of the highest value for 1892.

VICTORIA INSTITUTE,

8, *Adelphi Terrace, London, W.C.*

VICTORIA INSTITUTE
OR
PHILOSOPHICAL SOCY OF GT BRITAIN,
8, ADELPHI TERRACE, LONDON,

W.C.

Oct. 2 1891

Sir:

I am directed by the Council to lay before you the objects of this Society which is specially under the Presidency of Sir G. G. Stokes and is supported by 1400 home and Colonial members and associates.

The accompanying papers contain a brief statement as regards this Society which is increasingly attracting to itself the support of the scientific world. Its objects are very carefully carried out by able men and the published results of its work have been generally regarded as meriting approval. Further it has

enabled people to appreciate the true results of Scientific enquiry, and to dispel many erroneous ideas (see pink paper). The papers in its journal are not only widely circulated but many are also translated in several countries.

The Council has specially directed me to express to you its hope that the Institute may have your valued support as a member or an associate, and Sir Gabriel Stokes and the Council will cordially welcome that support.

I am
Yours very faithfully
F. Petrus
Karelce





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