

Thomas Burke *by* from the Author

INAUGURAL ADDRESS

DELIVERED BEFORE

THE ROYAL IRISH ACADEMY,

AT THE

STATED MEETING

HELD ON MONDAY EVENING, NOVEMBER 30, 1874.

BY

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President of the Academy.

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ADDRESS,

&c., &c.

GENTLEMEN,

It may have appeared to some members of the Academy, that at the meeting following that on which the distinction of being elected your President was conferred upon me, I should have addressed you upon the prospects of our body—on its position with regard to what it has done and what it is to be hoped it may yet achieve.

Yet, I trust that the delay which has occurred in thus inaugurating my term of office by such a retrospective and prospective sketch will be forgiven by you when you reflect that to make the address in any way worthy of the occasion and the place must necessarily be an onerous and important task.

Dating from the middle period of our Academy's existence, when the chair was filled by Brinkley, what a crowd of memories of great and good men, whose labours have done so much for the science, literature, and the archæology of the country, and therefore for the honour of the Academy, rush upon the mind. Some of them, it is true, have fought the good fight, leaving the light of their memories streaming behind them to ornament the past and illuminate the future, but we have many fellow-academicians still spared to us—to continue to enlighten our loved and, in more senses than one, our singular country, for it is a country singular for the mental power and the moral excellence of its inhabitants, for its ancient written and monumental history, its language, which in the sixth, seventh, and eighth cen-

turies, was full of the most refined, subtle metrical artifices, bearing evidence of the existence of a degree of literary culture in Ireland far beyond that of the contemporary Teutons and Scandinavians who seem to have been the only other Europeans then in the possession of a *vernacular* literature; the literature of France and Italy, during these centuries, having been in Latin, not in the native tongue. It is also remarkable for its early Christian architecture and its noble apostolic work, which bore the light of religion to Europe for many centuries.

The history of this Academy shows, that originating in 1772 as a private scientific and literary society, and thus continuing for fourteen years, it then received a charter of incorporation as a Royal Academy for promoting the studies of science, polite literature, and antiquities in Ireland, with a president and council of twenty-one members to represent in equal proportions these three departments. The first volume of Transactions was published in 1787, and was prefaced by the Rev. Robert Burrowes, who, after showing the correlation of mathematical, physical, and mechanical science, of chemistry and natural history, and their relations to national prosperity, speaks of the opportuneness of the time, and especially notices what has since so much redounded to the honour of Ireland, its medical school, its astronomical observatory, and the fact that it had for its first president the Earl of Charlemont, *clarum et venerabile nomen*, whose zeal for the practical interests of Ireland was only equalled by that for her advancement in learning.

The year 1822 is marked in the annals of the Academy by the election for its president of the Rev. Dr. Brinkley, then Andrews Professor of Astronomy, and subsequently Bishop of Cloyne. It was a remarkable time, for the collapse which followed the events of 1800 was succeeded by signs of a revival in the intellectual status of the country, and, in 1827, Hamilton succeeded to the chair of Astronomy, and, in 1836, his successor, the Rev. Dr. Lloyd, became Provost of Trinity College, where he had initiated those educational reforms which have so greatly assisted the progress of science and literature in the country.

Following the period from 1825, the country seemed to awake from an intellectual torpor of nearly a quarter of a century's duration. Our periodic literature and our schools of medicine seemed first to

have felt the impulse of the time, and the educational reforms in the University were carried into effect by Provost Lloyd. The energies of the Academy in its scientific, literary, and archæological departments began to re-develop. The Ordnance Survey of Ireland was undertaken, various schools of medicine and surgery, with their accessory sciences, sprang up, and, I am proud to say, that the name of Robert Graves stands out prominently in that illustrious band which reckons in its roll of honour the names of Cheyne, Colles, Cusack, of Macartney, and Smith.

But as regards the Academy, in what may be termed its period of renaissance, there are five names which stand out in relief as leaders of their respective departments of pure mathematics, physics, and archæology, Hamilton, M'Cullagh, Hincks, Todd and Petrie, all of whom were not only endowed with the most refined mental development, but animated with that love of country, that pure and true patriotism which, while it is not blind to its faults, never ceases to labour for its honour, and therefore its mental and material progress. To this object, in truth, their admirable lives, from early youth to their lamented deaths, were unchangeably devoted. Hamilton brought his splendid intellect, after a series of triumphs, to furnish the most advanced instrument of investigation, the Calculus of Quaternions, leading to paths hitherto unexplored. "Something like this," says the present Bishop of Limerick, "was the unshaken assurance which led Columbus to turn his back upon Europe, to launch upon the broad Atlantic and seek a new world in the far-off west."

Thus says Schiller, in apostrophising Columbus :—

"Steer on, brave sailor, steer right on, though scoffers may deride,
And the tired pilot at the helm his rudder east aside.
Yet ever, ever, Westward ho ! the coast must yet appear ;
Already to thy mental sight it rises bright and clear.
Trust to the God who guides ; pursue the silent ocean flood.
Even were it not, still there 'twould rise, to make thy surety good.
With genius nature joins, in everlasting covenant still
The promises of one the other fails not to fulfil."

The second name in this roll of honour is that of M'Cullagh, so long and truly devoted to the best interests of the Academy. His papers in our Transactions on geometry and on physical optics are distin-

guished by his power of giving to his researches that peculiar symmetry in their results, which is such an element of the beautiful in science, while he possessed that catholicity of knowledge which led him to help other branches of research, as well by his purse as by his example.

The next names of those now departed from us are Todd and Hincks—the one, who has done so much to illustrate our Irish ecclesiastical history; the other, our great Assyrian scholar and successful investigator of the Egyptian hieroglyphic inscriptions.

To turn now to Petrie. In a diary of his to which I have had access, written when he was but nineteen years of age, there are many entries which show he was even then a careful observer in archæology. Hamilton, as he advanced, achieved successive triumphs in pure and applied mathematics, till he raised the torch which revealed paths in the future hitherto undreamed of; while that in the hand of Petrie, lighting up the past, will still shine through the “dark backward and abysm of time,” till many of its secrets shall be revealed. “He became,” to quote again the words of the Bishop of Limerick, “the informing spirit, the great instructor of a school of archæology. He not only laid down the principles, but exemplified on a great scale the application to antiquarian science of the principles, of a philosophic induction.” Need I recal his foundation of our national museum, and our great library of Irish manuscripts; his admirable contributions to our Proceedings and Transactions, in which so much has been done to illustrate our pre-historic monuments and our early military and ecclesiastical architecture. His great essay on the latter subject was truly an *aureum opus*, as was also that on the antiquities and history of Tara Hill, *crescit occulto velut arbor ævo Fama*.*

The science of Archæology, that to which Petrie mainly devoted the greater part of his life, is the true basis of history, for the study of antiquity is the study of man. It must be remembered that the history

* In an interesting letter from Dr. Reeves, which is given in the memoir of Petrie's life, and written shortly after his death, that wise and learned antiquary says:—“It was only a fortnight since that Mr. Jellett and I had a conversation in the college courts about a successor to Dr. Graves in the Academy chair, and it would have pleased you to hear, as it did me, the earnestness with which the merits and claims of George Petrie were urged by the speaker, who said that he and Dr.

of Ireland has yet to be written as well as the dictionary of its ancient language, and it is only by the avoidance of all unfounded speculation, and by following up a scientific method in a careful spirit, that materials for these works can ever be accumulated.

Few things are more desirable for the Irish people than that truth in its history be firmly established, as a means of removing traditional errors and enmities on their part, and those prejudices in the mind of England, which have, unhappily, so long delayed the true union of the countries.

The first step in the study of our ancient monuments should be the faithful representation of them, now rendered possible by photography and casts; the collecting, comparison, and classification of each and all such facts, each faithfully represented object being a fact, and the circulation of such representations among all our fellow-labourers in the same field at home and abroad. By this means we can alone reap the advantages sure to follow, from the concentration of many minds upon the same point, and obtain broad and useful discussion of problems suggested by such monuments. Then let all records, traditions, and collateral facts be patiently searched out and brought side by side with these as it were in silence, no theory drawn, no premature conclusion; let such stand, and in time, the results will, by one of the great properties of truth, crystallize spontaneously into a system and a law.

There are in Ireland upwards of a hundred known Ogham legends. To place these in an authentic form at the disposal of philological scholars at home and abroad should be our first step. This is now rendered feasible by the facilities afforded us by Dr. Ferguson's labours. In his donation to the Academy of a large collection of paper moulds of inscribed stones, we have the nucleus of a paper cast inscriptional museum. Our first step should be to have these casts photographed, and then to circulate photographs from them among those scholars who by their knowledge of our ancient language have already proved themselves to be fully capable of aiding in our researches.

Haughton, and some other leading college men were determined to press the appointment of dear Petrie. He added, it must be either next month or never. Sad it is that the alternative can never arise, and that the father of the Academy can never assume the government of his household."

Many valuable papers have already appeared in our Proceedings on Ogham inscriptions, but they are only illustrated by wood engravings from drawings. In such cases the human eye can not be trusted as an infallible and reliable medium for representation, and without absolutely accurate representations we cannot have the aid we ought to seek in such studies from our fellow-students abroad. Therefore, I should advise that no more wood-cuts of these monuments should appear in our Proceedings, but that all our efforts should conduce to the publication of autotypes from Dr. Ferguson's photographs, for which purpose the sum of fifty pounds has already been allotted.

The Celtic philologist, Mr. Rhys, of North Wales, observes in a letter to me on this subject :—"As to the best means of furthering the study of Irish epigraphy, the Academy cannot do better than encourage Dr. S. Ferguson to take casts of all known Oghamic inscriptions in the country, and assist him to reproduce them by means of photography or otherwise, in such a way as to make them easily accessible to philologists. I have already seen a few specimens of Dr. Ferguson's work, and they seem to me most satisfactory. As matters now stand an outsider can hardly venture to give an opinion on Irish Oghams collectively, although I copied all the inscriptions of that kind which I could find mentioned in your Proceedings, my knowledge of them is still exceedingly incomplete and fragmentary." And he adds a hope that in time Irish scholars may be led to the discovery of some canons of criticism which may enable them to classify their Oghams chronologically, for until that is done their philological value must remain much less than it should be.

"I do not recollect," he adds, "seeing a single instance mentioned of the earlier class of Oghams which struck me as being anything but early Irish, and were there a complete vocabulary of the proper names which occur in Irish MSS. and literature generally, I fancy that a philologist would without difficulty identify 99 out of every 100 names to be met with on Ogham inscribed stones in Ireland." . . .
 "Looking at the question in a general way, I am inclined to think it not improbable that this alphabet may have been introduced into the south of Ireland first by a colony of settlers, from Britain, forced in the fifth century to look for a new home in consequence of a westward pressure due to the Saxon invasion, somewhat in the same way that some of our Kymric Celts settled in Brittany. The origin of Oghamic writing is still

hidden in darkness. Did the West Britons borrow the germs of this system from Rune writing nations or *vice versa*, or else are we to regard Runes and Oghams as of independent growth? These are questions which still remain to be solved, and the cryptic Runes of Scandinavian nations seem to be too late to assist us in answering them, though they betray a great similarity of principle. It is noteworthy that British Ogham writing is to be traced back to a time when we may reasonably suppose Cymric nationality to have revived, and a reaction against Roman habits and customs to have to a certain extent taken place when the last Roman soldier had taken his departure from our island."

To revert again to the errors into which we have been tempted to fall by too hasty conclusions, formed before any system of comparative archæology could be arrived at, it is manifest that in dealing with our megalithic monuments, and even with the architectural remains of a later period, serious mistakes have been made. Certain similarities of structure and design have been observed to exist between our earliest architectural works and those of the primitive builders in Greece and Latium, and these similarities have been held to prove similarity of race, although it does not appear that there is any idiosyncrasy or peculiar character in such structures or designs, sufficient to base any argument upon, or whether while such forms are common to two or three races at certain stages in their development, they may not also be common to many more. To bear out the theory of the early Greek colonization of Ireland another argument was used, founded on certain similarities in bronze weapons of Ireland and Greece, but now we know that the use of such was common to many places and in many periods, and that the Irish weapons do not resemble those of the Greeks more than do the weapons found in Scandinavia and elsewhere in Europe. No argument can be drawn as yet from the discovery of such bronze weapons as are found in Ireland, for it still seems to be uncertain when they were used in any particular region or by whom. The Greeks in the time of Homer used them, and the Egyptian monuments show us that on the Nile they were used at a very early period, while they have also been found in the Assyrian palaces, but it remains as yet unknown by what people they were used all over Europe.

It does seem as if certain similarities in forms of architecture and design might occur accidentally, might all belong to what may be termed the architecture of necessity, and such forms are

universally found to exist in the works of various peoples in a certain state of civilization, when possessed of mental power and energy. It will be said that our early histories all support the theory of Greek colonization and the so called Pelasgic or Cyclopean origin of our architecture, but when such writings are sifted and examined, few students will be ready to accept them as history. The traditions of these early builders are preserved in the Book of Leinster, the compiler of which died in the year 1160, in the Annals of MacFirbis, who died in 1279, and in a Tract, by O'Clery, written in 1460. Even supposing the transcriptions thus made in the thirteenth to the fifteenth century were of legends which had been committed to writing so early as the sixth or seventh century, they cannot be taken as authentic records of events occurring in the first centuries of the Christian era, or before. These writers were acquainted with classical history, and just in the same way as the biographers of the early Irish saints, who were familiar with Holy Scripture, attributed to them similar acts and miracles to those recorded of the Hebrew prophets, so did these authors of pre-Christian legends in Ireland swerve from the truth to colour their narrative with a glory borrowed from the heroic times of Greece.

In all cases, before yielding to the guidance of such records, traditions, and legends, we cannot be too careful, while reverently preserving and regarding all such, yet not to confuse them with history. Long and patient must be our watch before the dawn comes in which such monuments may be seen in the full light of history. As yet they stand *without* the province of scientific history, and by too rash and ardent striving to drag them into it, you do but drive them further into darkness. In dealing with tradition remember that it may or it may not be founded on fact, but fact cannot be founded on tradition. Tradition may guide us to a locality, but the discovery of that locality does not make that whole tradition true; and if the locality is ever to be a landmark in the history of our country, the investigation to which we subject it must be carried on by minds unwarped by any desire merely to verify the tradition. Follow with child-like singleness of purpose the light that tradition sheds over the past, and remember that in archæology we must ascend from the known to the unknown, and not theorise in antiquarian matters until we can step upwards from

fact to fact. The last words of Petrie, when speaking on this subject, were: "The true archæologist will every day lean more and more away from extremes in antiquity."

When considering the best practical method of furthering such aims as the archæologist should place before him, the subject of the preservation of national monuments must not be passed over. You are aware that the provisions of the Irish Church Act have placed in the hands of the Church Commissioners the guardianship of all ecclesiastical structures which have fallen into disuse as places of worship and may be considered worthy of preservation as national monuments, and they have, in accordance with the provisions of the Act referred to, vested in the Board of Work ssuch buildings as those at Cashel, Ardmore, Monasterboice, and elsewhere. Practically, the buildings on the Rock of Cashel are the only ones where the work of preservation has actually commenced. There is serious cause of alarm that a misdirected zeal in carrying on the works of preservation and repair may be more productive of evil than of good. When such works are "restored," they are generally greatly destroyed. Dealing with any ancient work of art, the restorer can never equal the original artist in the spirit or the feeling of his work; and the softening touch of time, which brings the ruin into harmony with the scene around till it too seems, in its unobtrusive beauty, a part of nature itself, can never be replaced, though it may too easily be dispelled, by the hand of man. In striving to impress this subject upon you, it is with the hope that you will feel with me that, as a body, we should unite in expressing our opinion that such monuments cannot be satisfactorily dealt with unless all works carried on in connexion with them be under the superintendence of some one or more persons endowed with special archæological knowledge, sufficient to render them competent for the duty of not only furthering and directing the works but also of restraining the workmen who should be employed to put such buildings in repair, or else that the architect should religiously confine himself to the most unobtrusive method of mere preservation—keeping them in their present condition.

It is desirable that we should, for a few moments, look beyond the limits of this Academy and this country, and consider the labours of others engaged in the same studies abroad, so that our energies may

be quickened by a noble emulation, and, as iron sharpeneth iron, so we and our brethren elsewhere may derive help from one another in their onward path. The present is a time of extraordinary energy in exploration and discovery abroad. The ore thus industriously gathered must, when passed through the crucible of wise and philosophic minds, yield pure metal, and will with certainty place the study of comparative archæology upon a surer basis. In Rome, the excavations carried on in past years, and still in progress, are of indescribable interest to the antiquary. The Forum Romanum, and many monuments of Imperial Rome, have been excavated, and most important results have accrued from the same works carried on within the area of the Coliseum, while, in the process of the erection of the new city, innumerable objects of art have been discovered, portions of statues, mosaic pavements, fresco paintings, which are being all carefully preserved and put together, and it is proposed to have local museums in each district, in which the principal objects may be exhibited.

Again, at Ephesus, the works of excavation carried on by Mr. Wood, at the site of the Temple of the Ephesian Diana, reveal to us the characteristics of a school of Hellenic art which arose in Asiatic Greece when Athenian artists sought refuge and employment there after the period when Athens still suffered from the effects of the Peloponesian war, for it is now well known that the rebuilding of the Temple of the Ephesian Diana was contemporaneous with Scopas and Praxiteles, one of whom, if not both, indeed, contributed to its sculptural decorations. The noble fragments which have reached this country, and now stand in the British Museum, show that the spirit of Hellenic art still lived to give witness of its noble origin.

To go still further back in the history of art, the results of French and English enterprise, the labours of such men as Lenormant and Fouqué, Charles Newton, and General Cesnola, and Lang, in the Levant and along the west coast of Asia Minor, have added immeasurably to our knowledge of Greek art, which before was but limited. Of the works of the Samian school, described by Pliny and dating four centuries before Christ, nothing was known until the discoveries on the Levant, while the Greek sculptures from the west coast of Asia Minor, now in the British Museum, or the objects in the Castellani collection, show by such examples as the statue of Demeter,

from Cnidos, or the bronze head from Thessaly, held by some to represent Aphrodite, by others, Artemis, teach us in their noble spirituality of expression to feel more vividly than we have ever felt before to what a high ideal of pure womanhood had Greek art attained long centuries before a Raphael or a Leonardo lived.

And, passing further back still, from the period of Hellenic to pre-Hellenic art, the discoveries of M. Schliemann, at Hissarlik, are of a value to archæologists, the amount of which it is impossible now to estimate—and this is true, in whatever way the vexed question may hereafter be decided as to whether the *Ilium Novum*, on the site of which these discoveries have been made, was indeed on the same site as the Homeric Troy. This involves questions as to how far history can be educed from mythology; how far Homer, as a poet, may be accepted as a historian; how near the time of the siege of Troy Homer lived. But the objects themselves, thousands in number, photographs of which are now in our Library, bear evidence in themselves that they belong to a period in art which is not only non-Hellenic, but pre-Hellenic, and to use the words of Mr. Newton, they appear to be “of that remote antiquity which we, vaguely groping in the twilight of an uncertain past, call pre-historic.”

These objects, found in a stratum of red ashes and calcined ruins at the depth of from twenty-three to thirty-three feet, consist of pottery, spearheads, said to be of copper, terra-cotta figures and ornamented discs or beads, and ornaments in gold and silver. The pottery is wrought and polished by the hand, to a lustrous surface, and ornamented with incised patterns, while Greek pottery is painted or varnished. There are no weapons of wrought bronze, such as those of the Greeks; there is no intelligible writing, with one doubtful exception, and, to quote from Mr. Newton, “while there is an attempt to model a face, whether human or owl-like, the conception of the human form as an organic whole, a conception which we meet with at the very dawn of Greek art, nowhere appears;” nor, the same writer adds, “can I detect, as in archaic Greek art, any trace of Oriental or Egyptian influence in any of the ornaments or devices.”

On the other hand, the pottery does resemble that found in Rhodes, Cyprus, Santorin, and Etruria, such as may be fairly held to be pre-historic, examples of which in Latium and Santorin were found under layers of lava, from volcanoes long since extinct; and there is a re-

semblance between the ornaments and certain bronze objects found at Halstadt, in Upper Austria, while they are unlike any of the ornaments of Greek art, which is embossed and chased, and sometimes decorated with what is called granulated work, *i.e.*, grains of gold, separately soldered on to the ornament.

They are ruder than any of the ornaments of Greek, or Phœnician, or Assyrian, or Egyptian time. But we should not be justified in forming conclusions as to their great antiquity merely from their rudeness. There is the rudeness of archaic art and there is the rudeness of barbaric art, which latter may belong to any time; and so with the self-restraint and patient spirit of investigation which belong to the true archæologist, Mr. Newton remarks, "We must not rely at present on any such arguments as those derived from their character, or even from their affinity to those remains whose antiquity seems so much more fully established;" and he points out as our further duty to push forward investigations elsewhere, till we have the means of comparing these Schliemann antiquities with some of those collections of pre-historic and barbarous remains which have, in recent years, been so diligently formed and intelligently classified in continental museums.

And here I would remind you that, in the pre-historic, or at all events in the un-historic, antiquities of Ireland, preserved in the museum of this Academy, in the great collection of pottery, in the ornamental discs, or so-called spindle whorls, and in the gold and silver ornaments, of which we have so large a number, resemblance may or may not occur with these in this Schliemann collection, the absence or presence of which would, either way, be an important fact to establish.

Again, the fact that in Ireland, as we learn from many communications of Sir William Wilde on the subject in our Proceedings, copper implements have been found to such an extent as to lead some learned archæologists to suggest that the use of bronze weapons was preceded by that of copper, is a subject which may give additional interest to the fact asserted by Schliemann, that many of these pre-Hellenic weapons discovered by him were of copper, and I should rejoice to see a paper on the subject of the copper finds of Europe from the author of our Catalogue, which is the most complete and learned account that has yet appeared of the antiquities of this country;

that this great work, begun in 1857, still remains unfinished, and that our ecclesiastical antiquities still remain undescribed and uncatalogued, is to me a subject of the deepest regret.

The catalogue of the gold ornaments and bronze weapons, as well as that of all articles in stone, clay, and bone, is all but complete ; but the silver articles, as well as those of iron, have yet to be catalogued. Although the museum was of necessity moved, still the arrangement and classification by material and use, adopted by Sir William Wilde, has been preserved, and it is proposed by our excellent curator to furnish a key to the work. It is to be hoped that Dr. Aquilla Smith will grant us his services in cataloguing and arranging the coins. We were informed last year by Sir William Wilde that he had already prepared the catalogue of the silver ornaments, for which 84 woodcuts are already engraved.

And here I may bring forward the name of one who has done great service in the study of archæology in general, and in that of Ireland in particular. I allude to Augustus Wollaston Franks, now head of the department of British and Mediæval Antiquities and Ethnography in the great museum of the nation. His most considerable printed work is his portion of the letter-press to the *Horæ Ferales* of Kemble, a work which must always be the text-book of the student of Teutonic and Celtic antiquities, and one in which much light is thrown on the bronze antiquities of Ireland. His communications to the Society of Antiquaries, constantly occurring since the year 1853, give evidence of his untiring zeal and cautious investigations in archæology, while the wide range of his knowledge is shown in his more complete works, published in the *Archæologia*. Before his time, the department of Native Antiquities in the British Museum did not exist ; for though many curious relics, found in different parts of the country, were preserved in the collection of Sir Hans Sloane, yet it was not till 1851 that consistency and a determinate character were given to the whole assemblage.

The small but valuable collection bequeathed to the nation by Mr. Christy has already become, under Mr. Franks's scientific care and energy, an important anthropological museum. The objects here collected, classified, and arranged, all bearing on the history of man from his first appearance on this earth, are as important to the geologist as to the antiquary. Such are the implements of flint and bone derived from the caves in the south of France.

The discoveries made in these places, Mr. Franks concludes, seem to point to the occupation of the districts in which they have been found by tribes nearly allied by their habits to the modern Esquimaux; and the remains of animals found with them likewise point to the climate of the south of France having been then far more arctic than at present. Among these early remains were found the first examples known to exist of the graphic art; for on the bones of reindeer, as well as of extinct mammals, are scratched representations of human forms, fish, and reindeer, which, though rude in the extreme, still show a power of seizing the characteristic action and expression of the subject which far exceeds the lifeless efforts in the same direction made by our early illuminators.

Such general services as Mr. Franks has rendered to the cause of archæology have won for him a well-deserved reputation. But in addition, let me remind you that he has a special claim on our gratitude, since it was through his instrumentality that the Petrie Museum was purchased for this country, and now forms part of that of the Royal Irish Academy.

I may here speak of our Library, which of late years has so increased in value. The purchase of new books and the addition of Transactions by exchange have greatly enlarged our collection, and the bequest of our late fellow-academician, Charles Haliday, of the vast collection of pamphlets relating to the history and social state of our country was a priceless addition to our treasures. The wealth of our Transactions will be every day augmented, not alone by the system of money grants in aid of research, but by that of the immediate publication of Papers approved of by the Council, with their necessary illustrations. It is confidently hoped that the extra-mural scientific bodies will see the wisdom of bringing about a closer accordance between their efforts and ours. It is to be regretted that there should not be a more combined exertion between them and this Academy. No wish is entertained here that the working of such societies should not be encouraged, but we trust that to each and all of them this body will ever be a pride as well as a helper.

Before leaving the subject of our Library, the work now being carried on, of the transcription of our ancient Irish MSS., must be mentioned. This was commenced during the time of our late President; and I am proud to say that the Academy has lately been

joined in the work by the University of Dublin. Great pains have been taken to insure a faithful reproduction of the original text. The Book of Leinster, from the Library of Trinity College, is now in the hands of the transcribers, under the superintendence of our Librarian. This is a manuscript which, though not older than the twelfth century, has been obviously compiled from much more ancient documents. There can be no doubt that, irrespective of other advantages, the publication of the historical matter contained in this manuscript will enable, as has been remarked by a fellow-academician, the future Irish historian to revivify the dry bones furnished by the meagre and often inaccurate chroniclers on whom he has hitherto had to depend.

You may remember that our Committee of Belles-Lettres is now united to that of Antiquities, and so the investigation of ancient literature forms a fitting part in the Academy work. The researches of Hincks and of Todd I have spoken of, but we have also a communication illustrating the studies of archæology, and the old literature of England in the 13th century by the learned Secretary of the Council. In this paper Dr. Ingram deals with the *Opus Majus* of Roger Bacon, in which Bacon points out in the first part, the four universal causes of human ignorance; in the second, the relation of philosophy to theology; and this is followed by four more parts, devoted to the knowledge of Languages, Mathematics, Optics, and Experimental Science.

In the Library of Trinity College there exists a beautiful MS. of the work in which Dr. Ingram has found a seventh part, the subject of which is Moral Philosophy. He concludes his paper on the Dublin MS. by expressing a hope, in which every literary Archaeologist will earnestly join, that he will lay before the Academy an account of its contents, extracting everything of interest as to the state of learning and philosophical opinion in the thirteenth century. The Rev. Dr. Reeves has also enriched our Transactions by his valuable and learned contributions, illustrating a curious and important phase in the early Christianity of Ireland; I allude to his exhaustive papers on the Culdees. In these are exhibited a most remarkable command of the materials of ancient Irish History, combined with, I need not say, the highest critical power of dealing with them.

In reviewing the labours of the Academy at large for the present half century, independently of those of Hamilton in Science, and Petrie

in Archæology, if we remember the researches of Lloyd, Graves, Salmon, Jellett, Casey, Apjohn, Ball, and Kane, in Pure and Mixed Mathematics and in the Physical Sciences, together with those of Haughton, Mac Donnell, Macalister and Purser in Biology and Comparative Anatomy, and Archer, Wright and Moore in Natural History, and Reeves, Wilde, and Ferguson in Archæology, we have good reason to be proud of the efforts of our academicians in Science during the period I have specified.

If we turn to Biology, the labourers are comparatively few, as compared with those whose Papers appear in the Proceedings of the Royal Society. But the value of the results is truly great, not alone as regards the discovery of fact, but in the philosophic mode of dealing with the great mystery of life. The researches of Professor Haughton, which culminated in his great work on Animal Mechanics, and which he so richly illustrated by his labours in Human and Comparative Anatomy, so illuminated by geometric science and algebraic calculation, first saw the light in the Proceedings of this Academy. In this remarkable work Dr. Haughton has ably shown the principle of Least Action in nature, by which he means that physical work is effected by means of the existing arrangement of muscles, bones, and joints, with a less expenditure of force than could be possible under any other arrangement, so that any alteration would be a positive disadvantage to the animal. The application of this principle, he considers, is probably of wider occurrence in nature than these instances show, and may give us some slight glimpse of the mechanism by which the conservation of species in nature is secured.

Speaking of the conservation of the solar system as dependent on certain well-known conditions regulating the motions of the several bodies of which that system consists, he observes—I quote his words—“that it is a matter of indifference whether these conditions were directly imposed by the will of the Divine Contriver, or were the indirect result of some former state of the system. In either case, these conditions are equally the foreseen result of the contrivance. If the present state of the solar system be the result, according to fixed laws, or some pre-existing state of that system, it may be said, in the language of Naturalists, to have been evolved out of its former state; but in such an evolution there was nothing left to chance; it was all foreseen, and the evolution itself presided over by the Divine mind that planned the

whole. I cannot see," he continues, "why there may not be, in organic life, a similar process of evolution from lower to higher forms of existence; but it is a teleological evolution, in which every step and every result was foreseen and planned beforehand. The laws of such an evolution appear to me, in the present state of our knowledge, to be utterly unknown."

This argument from the evidence of design runs through and is felt in every anatomical observation and every mathematical conclusion of Professor Haughton's work; and it seems as if the teleological evidence of a Divine Contriver is as immeasurable as the limitless series of beings endowed with life.

That the value of the contributions to Biology in our "Proceedings" seems to be inversely as their number appears when the list of their authors, after Dr. Haughton, is considered. Of these, the papers of Dr. Macalister are the most numerous and important, especially those relating to Muscular Anomalies in Human Anatomy, and their bearing on Homotypical Myology. These important memoirs, dealing with Human and Comparative Anatomy, are eminently calculated to reflect honour on their author, and to advance the study of Biology.

I would also specify the observations by Dr. Hayden on the Deviation of the Protruded Tongue in Unilateral Paralysis, and those by Dr. Purser on Suppuration and Inflammation, which are embodied in his Report on the Researches of Cohnheim.

I may here allude to the researches of Mr. Mackintosh on the Anatomy of the Sloths and the Coati-mundi. These papers must always be looked on as an important addition to our Proceedings; while the description by Dr. Collins of an additional lobe of the human lung has appeared in our Transactions.

When the physiological and histological laboratory has been completed in Trinity College, under the care of Professor Purser, we may look for important results. We may hope to compete with the laboratories of Cambridge, under Professor Foster, and of Edinburgh, where such singular results as to the influence of the compounds of the vegetable alkaloids with the organic bases Ethyl and Methyl have been arrived at by Drs. Crum Brown and Frazer, with respect to the substitution compounds of the alkaloids with the organic bases. Thus the Methylstrychnia acts as a pure spinal sedative, while the Ethyl-conia and Ethyl-atropia are more active, physiologically, than the pure alkaloids.

Dr. Macalister, in a letter to me, observes, that since these experiments began many French and German physiological chemists have taken them up. "What a pity," he observes, "that some of our Irish chemists should not work in this perfectly new department."

Yet, when the existence of a great Anatomical School in Dublin is considered, the paucity of the biological researches which have appeared in the "Transactions" of this Academy fills the mind with regret, however great their value may be—more especially, when contrasted with the number of such Papers in the Proceedings of the Royal Society. Why should not those who have the power have also the desire to follow the few leaders whose example has shed a lustre on our country? Will members of this Academy not assist others more largely than they have hitherto done in reaping the harvest which in golden waves is stretched before and around them?

The study of Embryology has led to many singular discoveries, and has shown how closely analogous are the laws of formation with those of disease. It had been held that in the early periods of existence organs were in their relations and form the same as in the perfect animal, differing only in their size. But it is now shown that, before arriving at its ultimate form, an organ must undergo certain transformations, numerous in proportion to its complication; so that there is a passage from a simpler to a more complex form, the latter being always preceded by the former. Embryology of the higher beings is thus reproduced by the comparative anatomy of the lower. Thus, the doctrine of organic pre-existences is overturned, so that the forms of the embryo will not give us a knowledge of those of the more advanced being.

In this progressive formation, as observed by Serres, a particular affinity seems to preside over the arrangement of structure, each organic tissue and each part of an organ being directed towards the part or tissue with which it is homogeneous and only uniting with it.

Thus nerves form themselves with nerves, arteries with arteries, osseous nuclei with bone; but we never see the kidney unite itself to the liver, or the combination of a nerve with an artery.

We might believe in following these formations that we were assisting at a regular crystallization of different cells in which the homogeneous molecules are attracted, while the heterogeneous are repelled; *and this under the influence of Life.*

Development, as distinguished from mere growth, ceases when the pre-ordained form of the organ is completed; but its arrest may at any period be attended with the growth of the *imperfect* organ. In this way monsters may be, and are, produced, but no lesion of organogeny in the inferior embryo can elevate the being in the biological scale. A reptile cannot proceed from a fish, a bird from a reptile, a mammal from a bird, and, I may add, a man from an ape. Much has been said as to the powers and effects of natural selection in organisation, but there is a determined line beyond which, higher at least in advancement, it wholly refuses to go.

It will be thought that, in reference to Biology, the controversy as to the teleological argument and the views of some modern Biologists should be here spoken of. But it seems to me that the observation, investigation, and accumulation of facts is a work more fitting for this Academy than dealing with matters of speculation. "Scientific labour," as I once heard Professor M'Cullagh say, "should have two ends, one subsidiary to the other; first, the discovery of fact, and the natural sequence of observation; and next, the correlation of what is thus discovered, with evidences of a power, immeasurable, inconceivable, and all-embracing."

In relation to the pathological aspects of Biology, the powers of polariscopic analysis have been, in the hands of our late distinguished President, shown to have opened up a new and wide field of investigation. In his researches we can see how physical phenomena can touch the mysterious conditions of life. This is not a question of structure, whether it be or be not histological. It is truly one of property, one of the varied results of life on organic form during its appointed period of existence. In diabetes mellitus the renal function, acting under the influence of the nervous power, or, in other words, of animal life, produces results all but identical with those of the living vine or sugar cane. We have here one out of many illustrations of the views of Serres, that defect or disease in the higher organisms reproduces the normal conditions in those that are inferior; and *this* principle we perceive to be true, not alone as to form and structure, but as to the chemical composition of the resulting secretion.

Of the first of these propositions many examples might be given. The internal ectopia or the existence of the abdominal viscera in the thorax represents the want of the diaphragm in birds:

the enlargement of the hepatic veins in the cardiac and pulmonary obstruction is reproduced in the warm-blooded diving animals by the temporary enlargement of the portal and hepatic veins, which disappears on the first expansion of the lungs by respiration. The anatomy of the perfect form is widely different from that of the imperfect with its arrested development; and, in the same way, the function of the higher organ or group of organs may be degraded to many inferior results. It would seem as if the secretion of one of the sugars belonging to vegetable life implies a descent in the function of animal life, and so we gain in diagnosis less, it is true, in the change of structure than in that of functional alteration. And analogous results are seen in the chemical condition of secretions. Here the function of secretion, if not the structure, is retrogressive, and the animal organ comes to represent a lower or vegetable function.

Biology, looked on as a study of the mystery of life, is to be considered in its normal and abnormal phenomena, as well as the relation of physical investigation to vital conditions. And this brings before us largely the present state of Curative, and, more directly, of Preventive Medicine—for it is by physical investigation that the medical science of the present day has so largely advanced. Acoustic, Optical, Chemical, and Electric conditions must now all be studied in relation to this great question. The discovery and differential diagnosis by auscultation of the normal and abnormal states of the heart, arteries, air-tubes, pulmonary cells, and, in many instances, too, of the abdominal viscera, including the uterus, has been carried, when considered in connexion with the general state of the system, to a great point of advance. The ophthalmoscope has revealed not alone changes of the eye, but of organs distant from the eye; cerebral, cardiac, and embolic disease. In the hands of Dr. Cruise, the endoscope enables us to discover, to study and measure a vesical calculus—an almost capillary stricture, and to direct a local treatment to an ulcerated state of the intestinal surface. In Surgery, too, we can make use of anæsthetics to prevent all pain in operation, whether they be used by inhalation or direct contact with the part. The loss of blood, too, under the knife is prevented, in most cases, by the method of Esmarch. On a late occasion of the operation for supra-condyloid amputation of the thigh, Mr. Adams, Regius Professor of Surgery in Dublin University, said, "This is the first time I have witnessed a

great operation, performed not only without pain, but without the loss of a single drop of blood."

But it is certain that, until a broader and more searching light is shed on human biology, *Curative medicine* must continue related to an enlightened empiricism, though it may be hoped that that relation will be more and more remote. But Preventive medicine—that great outcome of the study of the combination of physical influences with vital results—will largely advance with every true observation of these influences on all the phenomena of life, whether in health or disease.

It is now many years ago since the late Dr. Robert Graves proposed that the different governments of Europe, America, and India, should establish and endow corresponding Medical observatories, supplied with every requisite for recording the advance of epidemic and sporadic disease, in connexion with the meteorological, atmospheric, and telluric conditions of the time, together with those of the physical state of the population, its longevity and its mortality.

In this way, a great advance in the study of Preventive medicine might be anticipated, though we cannot hold that every aberration from health is due to preventible causes; for who shall indicate the results or the origin of conditions that may be long hereditary?

Yet, notwithstanding all our researches and discoveries of additional laws, physical and vital, all that we have learned of the conservation and transmutation of energy brought about by a living being, in the words of Professor Stuart, "we should find that the physical antecedent of the phenomena was, probably, a much less transmutation; while, again, the antecedent of this would, probably, be found still less; and so on, as far as we could trace it. But, with all this, we do not pretend to have discovered the true nature of life itself, or even that of its relation to the material universe. In fine," he says, "we have not succeeded in solving the problem as to the true nature of Life, but have only driven the difficulty into a border land of thick darkness, into which the light of knowledge has not yet been able to penetrate." Speaking of the difference of animals and inanimate machines, he observes that while the latter requires for its sustenance only some variety of chemical separation; the other—the living being—must be supplied with organised tissue. After speaking of the sun as the source of energy, and of the future of our race depending on its future, he concludes:

"But here, at length, we come to matters beyond our grasp, for

physical science cannot inform us what must have been before the beginning, nor yet can it tell us what will take place after the end."

The most singular result of the Polariscopes in the examination of a compound produced under the influence of Life, is the *rotation* of the ray of light, telling of the relation of the substance to the process of organisation. This is seen in the optical examination of the animal or vegetable sugars. It is seen in quinine and various alkaloids. It is right to state, however, that a German chemist affirms that he has produced from inorganic material a compound which possesses the power of rotation of light. If this be so, it is only another instance that the hard and fast lines in nature are, though rarely, exceptional.

It may be hoped that, with the advance of the polariscopic qualitative, if not quantitative analysis, other functional changes will be recognised, and, by the reflected light of such discoveries, dealing with chemical composition rather than structure, will reveal what the microscope is powerless to discover, telling of a chemical composition developed and illuminated by a ray of polarised light—not so much in form, not in any speciality of structure, but in the marvels of Life under Law.

The conservation of energy, directive though not creative, in the living organised structure, and the chemical affinities in that which is unorganised, show, it might be held, that a lower mode of life pervades every existing being; but we believe that in God's own time that higher life which shows itself in progressive organisation, and is terminable, will have a different existence, as least as regards the human being, one freed from material associations, freed from physical influences and from moral shortcomings.

It is believed by thoughtful men that matter is indestructible. May we not find that as it has, in Time, subserved the physical, so in Eternity it will, when spiritualised, subserve the moral law, and thus an undying result will be evolved.

It has been written that we "see as through a glass darkly;" but are there not grounds for the belief that such will not ever be the case? May we not believe that every discovery in development, in microscopical structure, in chemical composition, and in electrical and optical character, will be, when related to the property of Life, a fuller ray of the burning lustre by which we approach the footstool of that throne where we shall be permitted nearer and nearer to contemplate the power and the ineffable light of Him from whom comes all Life?