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SIR CHARLES LYELL

HIS PLACE IN GEOLOGICAL SCIENCE AND HIS CONTRIBUTIONS TO THE GEOLOGY OF NORTH AMERICA[1]

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THERE are few periods more eventful or more interesting in geological history than the earlier half of the nineteenth century. While at the opening of the century Hutton had passed away and Werner was an old man whose work was well-nigh done, the great controversy between their followers, the Plutonists and the Neptunists, still raged on.

In the first half of the nineteenth century, however, geologists bent their attention more particularly to a close and intimate study of the structure of the earth's crust. It had already been recognized that there was some sort of succession of layers of mineral matter in the earth's crust; Werner had indeed introduced the term *geognosy* for the study of these. But in the period under consideration this succession was definitely established, and the formations (as Werner would call them) comprising it were grouped in their successive series and systems, succeeding one another in regular order, and each marked by its own peculiar organic remains, or "organic fossils" as they were then called.

The science of historical geology was thus brought to birth, and the recognition of the chronological value of fossils may be said to have done more to advance and consolidate the progress of geological knowledge than any discovery that was ever made.

One of the leaders in this great work was William Smith, usually known as the "Father of English Geology." His contributions are set forth chiefly in his great geological map of England and Wales and its

[1] An address delivered, at the request of the organizing committee, before the International Geological Congress at Washington, D. C., on July 25, 1933, in commemoration of the centenary of the publication of Lyell's "Principles of Geology" in 1833.

accompanying Memoir, which appeared in the year 1815, and in his "Strata Identified by Organized Fossils," which came from the press the following year.

Smith arranged the formations in their true order from the Killas (Lower Devonian, etc.) of Wales up to the Tertiary of the London Basin. This succession required, however, to be extended, filled out and subdivided in further detail. That portion of it below the Old Red Sandstone, the "interminable grauwake" as Murchison called it, was regarded as an inchoate jumble in which no order could be traced, while in the upper portion of the column, the great succession of the Tertiary rocks, awaited study and the discovery of some method by which it could be classified.

To this fascinating task a number of men, the immediate successors and most of them the contemporaries of William Smith, addressed themselves.

Among these men whose names have now a world-wide celebrity are Murchison, Sedgwick, Darwin, Forbes, Ramsay, Buckland, Hall, Phillips, Conybeare, Fitton and Webster. All of them were fellows of the Geological Society of London, a society which was founded in 1807 "to investigate the mineral structure of the earth," and during the first half of the nineteenth century this society was the meeting place for all those who were actively engaged in geological studies in England, its meetings were the forum for presentation, debate and discussion of all new geological observations and discoveries, and its Transactions became a veritable storehouse of the results of the most valuable original researches.

Charles Darwin was an enthusiastic member of the society at this time, and in a letter written from Lima and addressed to W. D. Fox in 1835, he says: "I am glad to hear you have some thoughts of beginning Geology. I hope you will; there is in it so much larger a field for thought than in the other branches of Natural History. Geology is a capital science to begin, as it requires nothing but a little reading, thinking and hammering."— a truly happy state of affairs which has now passed away under the accumulated burden of acquired knowledge; and in another letter written to Miss Buckley, Lyell's secretary, on the occasion of Lyell's death, he says of Lyell, "How completely he revolutionized geology; for I can remember something of pre-Lyellian days —I never forget that almost everything which I have done in science I owe to the study of his great works."

Into this brilliant group came the young lawyer, Charles Lyell, who, while studying at Oxford, had attended the lectures on geology delivered by Dean Buckland, then professor of geology at that seat of learning and at the height of his popularity, which lectures had interested him intensely

He was the eldest son of Charles Lyell, Senior, and was born at Kinnordy in central Forfarshire, where his father's estate was situated, on November 14th, 1797, and died in 1875 at the age of 78. The elder Lyell was a botanist of some renown, a man of cultivation and refinement, who was also known as a student of Dante. When his son was only a year old, Charles Lyell, Senior, took up his residence in England, at Lyndhurst in the New Forest.

The younger Lyell, after leaving school, went to Oxford, where in 1819 he graduated with second-class classical honors. He then studied law at Lincoln's Inn and Gray's Inn and went on circuit in 1827. He was moved to give up the study of law chiefly on account of the weakness of his eyes, a trouble which hampered him in his work throughout his entire life, but which was a less serious impediment to him in the new profession of geology which he adopted than it had been in that of the law which he was obliged to relinquish.

Lyell's first contribution to geological science was a paper which he read before the Geological Society of London in 1825, just fifteen years after the appearance of William Smith's epoch-making map, under the title, "On a recent Formation of Freshwater Limestone in Forfarshire and on some recent Deposits of Freshwater Marl," being a description of the deposits in a marl lake at Kinnordy in Forfarshire, the property of his father. Not long after he became one of the honorary secretaries of the Geological Society.

Having familiarized himself, in a general way at least, with the geology of Great Britain, Lyell proceeded to extend his knowledge by traveling in other countries.

In 1828 he joined Murchison in a visit to the continent of Europe, where, under the guidance of Constant Prevost, they made a study of the Tertiary deposits of the Paris basin, and later they saw the enormous succession of beds of limestone displayed in Italy, especially in the district about Syracuse in Sicily, made up of shells, many of them of species still living in the waters of the Mediterranean, which interested him greatly.

They also visited the extinct volcanoes of the Auvergne district as well as Vesuvius and Etna. The evidence of the elevation and subsidence of land, accompanying recent volcanic action, seen in the vicinity of Pozzuoli, made a deep impression on his mind.

Later he returned to Italy and France and visited many localities which are of especial interest to the student of geology.

He also traveled extensively in Germany, Austria, Denmark and Scandinavia. When in Bohemia, in company with Barrande, he studied the "Primordial

Succession" of that country and visited certain of Barrande's "Colonies." In the same year he went to Switzerland for the purpose of studying the action of ice as displayed in the Alpine Mountains.

In 1841–42, 1846, 1852 and again in 1853, he visited North America.

He was a great believer in the importance of travel in the education of a geologist. In a letter to Murchison written in 1829 he says, "We must preach up travelling, as Demosthenes did 'delivery,' as the first, second and third requisite for a modern geologist in the present adolescent state of the science."

The results of his geological observations in these various countries are set forth in an extended series of papers, most of which appeared in the *Journal* of the Geological Society of London.

The benefit which accrued to science from Lyell's extended travels lay not so much in these individual papers as in the wide range of the knowledge which he gained of the geological sequence in many widely separated areas of the earth's crust, and of the actual knowledge of the geological forces now at work on the earth's surface and of the effects which they were producing.

He did not, like Sedgwick, Murchison or Logan, add new chapters to geological history, but, as Ramsay once remarked to Geikie, "We collect data and Lyell teaches us to comprehend the meaning of them." He had a keen critical sense and a remarkably clear vision of great vistas in geological science—so much so that Darwin has stated as his opinion that "the Science of Geology is enormously indebted to Lyell—more so, I believe, than to any other man that ever lived."

It was this comprehensive grasp of the problems of geology which enabled him to write his great work entitled "Principles of Geology," whose appearance we commemorate to-day, and of which Geikie remarks that "of all the English writers of general treatises on geology, the first place must undoubtedly be assigned to Charles Lyell whose 'Principles of Geology' will always rank as one of the classics of geology and must form an early part of the reading of every man who would wish to make himself an accomplished geologist."

The full title of this great classic sets forth its scope; it reads, "Principles of Geology, being an attempt to explain the former changes of the Earth's Surface by reference to causes now in operation." The first edition appeared in three volumes, embracing in all 1,348 pages with accompanying maps, plates and illustrations. These three volumes appeared in succession—the first in 1830, the second two years later in 1832 and the third in 1833, just 100 years ago. The work went through twelve editions—the last of these appearing in 1875.

In this brief address it is possible merely to touch upon one or two of the outstanding problems discussed in this great classic. They are in a general way summarized in the opening pages of Volume 3, and I shall, so far as possible, employ Lyell's own words.

All naturalists, he says, who have carefully examined the arrangement of the mineral masses composing the earth's crust have recognized therein a great succession of former changes and sought for the causes of those changes. As the first theorists possessed but a scanty acquaintance with the present economy of the animate and inanimate worlds, and the vicissitudes to which these are subject, we find them in the situation of novices who attempt to read a history written in a foreign language, doubting about the meaning of the most ordinary terms, disputing, for example, whether a shell was really a shell, whether sand and pebbles were the result of aqueous trituration, whether stratification was the effect of successive deposition from water, and other questions which now appear to us so simple that we can hardly conceive them ever to have been the subject of controversy.

It appeared to them more philosophical to speculate on the possibilities of the past than patiently to explore the realities of the present. The habit of speculation produced a state of mind unfavorable in the highest degree to the reception of the evidence of those minute but incessant changes which every part of the earth is undergoing. It appeared as improbable to these early speculators of geology that the study of earthquakes should one day throw light on the origin of mountains, as it must to the first astronomers that the fall of an apple should assist in explaining the motions of the moon.

In an attempt to unravel the difficult questions presented to us, Lyell goes on to say, we shall adopt a different course, restricting ourselves to the known or possible operations of existing causes, feeling assured that we have not yet exhausted the resources which the study of the present course of nature may provide, and therefore that we are not authorized in the infancy of a science to recur to extraordinary agents. We shall endeavor to patiently unite the Gordian knot rather than attempt to cut it. In so doing we must consider the operation of aqueous and igneous forces, the geographical distribution of animals and plants, the successive extinction of species and so forth. These topics we regard as constituting the alphabet and grammar of geology, not that from them we expect to obtain a key to the interpretation of all geological phenomena, but because they form the groundwork from which we must rise to the contemplation of more general questions relating to the results which, in an indefinite lapse of ages, the exist-

ing causes of change may give rise. This is the doctrine of uniformitarianism with which Lyell's name will always be associated.

It has sometimes been objected that Lyell went too far in that he attributed all changes in the earth's crust to the slow, continuous and uniform action of the geologic agents, whereas catastrophic action does take place, and has been observed to do so even at the present time. This criticism, however, misses the point of Lyell's teaching. He recognized that in the regular course of nature great catastrophies do occur from time to time. But, as he says, we are authorized to regard them as part of the present order of nature, provided we do not imagine them to have been more frequent or general than we expect them to be in time to come. That is to say, the changes which have taken place, are taking place and will take place on the earth's crust go on with a general uniformity, there being here and there and now and then great landslides, earthquakes or volcanic explosions, through all the ages.

Lyell's "Principles" furnished a direct and immediate answer to Cuvier's "Discours sur les Revolutions de la Surface du Globe" which appeared in 1825, just before Lyell visited him in Paris when on his trip to the Continent with Murchison, and which presents the other side of the picture and represents views commonly held before Lyell's time.

Cuvier was one of the last of the great catastrophists and had been engaged in his classic studies on the paleontology of the Tertiary Succession of the Paris Basin. He had found evidence of the frequent elevation and subsidence of this great area, with the disappearance of old faunas and the appearance of new ones, and to explain these he invoked a succession of sudden and overwhelming catastrophies. These are his words in this connection (translated):

> The changes which resulted in the appearance of dry land in this region were not due to a more or less gradual and wide-spread subsidence of the waters. There were many sudden uprisings and many successive retreats, which resulted however in a final lowering of the general level. But it is very important to bear in mind that those repeated advances and retreats were not slow and gradual in character—on the contrary most of the catastrophies to which they gave rise were sudden, and this is especially easy to prove in the case of the last one, which by a double movement, consisting first of an inundation and then of a retreat of the waters, left our present continents essentially as we see them to-day.
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> It left behind also in northern countries, the carcasses of the great quadrupeds which are found embedded in the ice and preserved down to the present day intact with their hair, hides and flesh. On the other hand, this perpetual frost did not previously occupy the areas where we now find it, for those animals could not live at so low a temperature. It was therefore at one and the same instant that these animals perished and that the glacial conditions came into existence.
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> This change was sudden, instantaneous not gradual, and that which is so clearly the case in this last catastrophe is not less true of those which preceded it. The dislocation and overturning of the older strata show without any doubt that the causes which brought them into the posiiton which they now occupy, were sudden and violent; and in like manner testimony to the violence of the movements which influenced the waters is seen in the great masses of debris and rounded pebbles which in many localities are found intercalated between beds of solid rock.
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> Life upon the earth in those times was often overtaken by these frightful occurrences. Living things without number were swept out of existence by catastrophies. Those inhabiting the dry lands were engulfed by deluges, others whose home was in the waters perished when the sea bottom suddenly became dry land; whole races were extinguished leaving mere traces of their existence, which are now difficult of recognition, even by the naturalist. The evidences of those great and terrible events are everywhere to be clearly seen by anyone who knows how to read the record of the rocks.[2]

It was to such opinions that Lyell's theory of uniformitarianism was opposed. His "Principles of Geology" gave the death blow to the great catastrophic school of geologists.

Another great contribution which Lyell made to the science of geology is set forth in the third volume of his "Principles"—namely, the classification of the succession of the Tertiary deposits on the basis of the proportion of recent species found fossil in each.

He states that he had already conceived this idea in 1828 when he visited Italy. He then found that Bonelli and other conchologists had been investigating the relative proportion of living species in the fossils of the Tertiary rocks of that country but had reached widely different results. In the following year, 1829, when he returned to Paris, he communicated his new views to Desnoyers and, learning from him that Dehayes had been working along the same line, at once visited this latter gentleman and arranged to secure his cooperation in this important work, which was thus carried forward to its successful conclusion.

This conclusion, however, had only been reached after much thought and investigation and after Lyell had many times been obliged to change his opinion owing to his discovery of new evidence—"I have frequently been led to reflect," he writes, "on the precept of Descartes that a philosopher should once in his life doubt everything that he had been taught."

Following his "Principles," Lyell wrote two works —the "Elements of Geology" and the "Student's Ele-

[2] "Discours sur les Revolutions de la Surface du Globe," M. le Baron G. Cuvier, 1826, pp. 8 and 9.

ments of Geology" which for many years remained the most important text-books of the science throughout the English-speaking world. The great life work of the author is again exemplified in them, by his treatment of the various systems in descending order, instead of the reverse, as in all modern text-books, thus proceeding from the known progressively further back into the unknown, from present conditions to those of the ever remoter past.

In 1841 Lyell was invited by Mr. Lowell to deliver the Lowell lectures in Boston that year. He made this the occasion for an extended visit to North America during the years 1841 and 1842 and gave an account of his experiences in a book entitled, "Travels in North America in the years 1841–42, with geological observations on the United States, Canada and Nova Scotia," which was published in 1845.

He paid a second visit to America in 1846 and described his travels in another book which bears the title, "A Second Visit to the United States of North America."

He visited North America again in 1852 and gave the Lowell lectures in Boston in that year, and returned a fourth time in 1853 to act as commissioner to the New York International Exhibition.

These books deal chiefly with incidents of travel and with the social and political conditions of the United States and Canada at that time. He was greatly interested in observing the development of society in these new countries, where conditions were as yet immature and often crude, but being a man of wide human sympathies he took a kindly and understanding interest in all that he saw and heard. He narrates many interesting incidents of American life of the times, which can not here be referred to further. Among other things he mentions the large number of classical or Old World names which had been adopted by various places which he and Lady Lyell, who accompanied him, visited on their tours. "In a short excursion of one month," he says, "we had been at Syracuse, Utica, Rome and Parma, had gone from Buffalo to Batavia and on the same day breakfasted at St. Helena and dined at Elba. We collected fossils at Moscow and traveled by Painted Post and Big Flats to Havana. After returning by Auburn to Albany, I was taken to Troy, a city of 20,000 inhabitants, that I might see a curious landslip which had just happened on Mount Olympus, the western side of the hill, together with a contiguous portion of Mount Ida having slid down into the Hudson and caused the death of several persons."

In his first book, however, he describes, at some length, a number of places of geological interest which he visited and refers with pleasure to meeting many of the leading geologists of North America, who took him to see sections which they had studied in detail and discussed with him the problems which they presented. These discussions, by bringing together, as they did, the experiences derived from the study of such problems in Europe and America, respectively, materially contributed to a true understanding of the same and assisted in establishing many valuable correlations.

While the description of the geological occurrences which he visited, as given in his first book, are more or less popular and adapted to the comprehension of the general reader, more detailed and technical descriptions of a number of the more important of them are presented in a series of papers which he contributed to the Geological Society of London and to *Silliman's Journal,* shortly after his return to England.

One of his first geological excursions in America was made with James Hall:

> On leaving Albany [he says] I determined so to plan my route to the Falls of Niagara so as to enable me to see by the way the entire succession of mineral groups from the Lowest Silurian up to the coal of Pennsylvania. Mr. James Hall, to whose hands the N.W. division of the Geological Survey of New York had been confided, kindly offered himself as my guide. Taking the railway to Schenectady and along the Mohawk valley we first stopped at Little Falls where we examined the gneiss and the lowest Silurian sandstone resting upon it. We then pursued our journey along the line of the Erie Canal and the Mohawk River, stopping here and there to examine quarries of limestone and making a short detour through the beautiful valley at Cedarville in Herkimer County, where there is a fine section of the strata. Afterwards we explored the picturesque ravine through which the Genesee flows at Rochester. The excavations also made for the Grand Canal at Lockport afforded us a fine opportunity of seeing these older fossiliferous rocks laid open to view. . . . In the course of this short tour [he continues] I became convinced that we must turn to the New World if we wish to see in perfection the oldest monuments of the earth's history, so far at least as relates to its earliest inhabitants, certainly in no other country are these ancient strata developed on a grander scale or more plentifully charged with fossils.

At Troy he visited Eaton, and when at New Haven he saw, in company with the two Sillimans, East and West rock, which he compares with the Salisbury Crags at Edinburgh. Later, in company with H. D. Rogers, he visited the anthracite region of Pennsylvania.

In discussing the origin and structure of the Appalachian Mountain Chain he says:

> According to the theory of the Professors Rogers, these wave-like flexures are to be explained by supposing the strata, when in a plastic state, to have rested on a widely

extended surface of fluid lava and elastic vapours and gases. The billowy movement of this subterranean sea of melted matter imparted its undulations to the elastic overlying crust, which was enabled to retain the new shapes thus given to it by the consolidation of the liquid matter injected into fissures. For my own part [he goes on] I can not imagine any real connection between the great parallel undulations of the rocks and the waves of a subjacent ocean of liquid matter.

It is interesting to note that on the 25th of April, 1842, Lyell attended at Boston the third annual meeting of the Association of American Geologists, a body which in 1847 developed into the American Association for the Advancement of Science, and which may be considered as the predecessor of the Geological Society of America, which came into being in 1888. Among those who were present at this meeting he mentions Hitchcock, the two Rogers, Vanuxem, Emmons, Hall, Beck, Jackson, Locke, the two Sillimans, Bailey, Dana, Hayes and others; and he states that the structure of the Alleghany Hills and of the coal fields of America, the origin of coral reefs, the glacial theory, the effects of icebergs, the nature of the footmarks in the red sandstone of the Connecticut Valley and other subjects were debated upon during the week in an animated but most amicable style.

When in America Lyell also made a study of the Tertiary succession in Virginia, the Carolinas and Georgia, as well as of the question of the recession of Niagara Falls as a measure of geological time.

He was also much interested in the wide-spread evidence of glaciation in post-Tertiary times. Like so many other geologists of his day, he believed this to be due to floating ice.

When visiting Amherst College Hitchcock took him to several ridges of "drift" in this vicinity. These, he says are precisely the same as those in Scotland and Northern Europe. "They have been called Moraines by some geologists, but if we call in the agency of ice, as I am well disposed to do, we must attribute their accumulation to the melting of icebergs charged with fragments of gravel and rock rather than to glaciers. Professor Hitchock has in fact," he says, "called them iceberg moraines."

On his first visit to America Lyell spent a month or more in Nova Scotia, where, in company with Dawson, who later became principal of McGill University, he made a study of the succession of the Carboniferous rocks in that province and especially of the remarkably fine sections of the Coal Measures displayed on the shores of the Bay of Fundy and known as the Joggins Section.

"This subterranean forest," he writes, "exceeds in extent and quantity of timber all that have been discovered in Europe together."

Perhaps I can not do better in closing this address than quote some words of Dawson concerning Lyell and the place which he filled in geological science—taken from Dawson's last published work, entitled "Fifty Years' Work in Canada":

In 1841 [Dawson says] I met with two great geologists, whose friendship followed and assisted me through the earlier years of my career. These were—Sir Charles Lyell, who more than any other man gave form to modern geological science; and Sir William Logan, who gave the first great impulse to the systematic geology of the older rocks of the North American continent, and originated the Geological Survey of Canada. To other men who have passed away, and whose friendship I have enjoyed, I owe much; but to Lyell and Logan I owe most.

The benefits rendered by Lyell to American geology in connection with his several visits to this continent, it would not be easy to overestimate. At the time of his first visit, few English geologists had seen those great breadths of the older, and of the more recent formations, by which this continent is distinguished, or had had the means of realizing for themselves the resemblances and differences of the formation on the opposite sides of the Atlantic; and the American and British workers in these subjects were little known to each other. The visits of Sir Charles Lyell did much to remedy all this. His own mind was filled with those grander aspects of geological phenomena which appear in America. He brought into correspondence with each other such workers in science as his intuitive tact perceived to be suited to give mutual aid.

In these American researches, the great gifts of the man were brought out in a light somewhat different from that in which they appear in his general works. The main distinction between Lyell and most of his contemporaries was his eminence as a thinker, whether in inductive or deductive reasoning. Like most of the English geologists of his time, he had received less training in the characters of minerals and rocks than that which the more severe schools of science exacted, and his imperfect vision was a great hindrance to field work, and sometimes even a source of personal danger; but when facts, however complex, were once obtained, they grouped themselves in his mind in their natural relations with an unfailing certainty, while their connections with all the other parts of his vast stores of knowledge, and the general conclusions deducible from them, came out with a degree of clearness always beautiful, and often even startling.

A feature of his mental character was the readiness with which he accepted new conclusions, and relinquished without regret views which he might have long held, when he perceived them to be shaken or untenable. He seemed wholly free from that common failing of men of science which causes them to cling with such tenacity to opinions once formed, even in the face of the strongest evidence. This quality eminently fitted him to be the expositor of a rapidly advancing science, and also to be the patron and helper of younger and less eminent men, and was

connected with that warm and eager interest which he ever felt in the progress of knowledge, and with the deference with which he received new facts and suggestions from any quarter.

The qualities, apparent in his connection with American geology, were equally valuable in his relations to science in its general aspects. A man so gifted, fortunate in his genius, his education, his outward circumstances, and in his appearance on the stage at a time when geology had gathered in some of its great harvest of facts, and was waiting for a master-mind to arrange them, had a great opportunity, which Lyell had the energy and ability to seize. He was thus able to become a guiding mind among his contemporaries in geological theory, and to hold his pre-eminence down to the end of his life, and through all the great changes which occurred in the rapid development of the science.

Such was the man whose life and works we commemorate this evening.

SCIENTIFIC EVENTS

THE ROSS INSTITUTE AND THE LONDON SCHOOL OF HYGIENE AND TROPICAL MEDICINE

THE *British Medical Journal* states that a printed memorandum on the proposed amalgamation of the Ross Institute and Hospital for Tropical Diseases with the London School of Hygiene and Tropical Medicine has been issued by Sir Charles McLeod, chairman of the institute. On the death of Sir Ronald Ross he considered it his duty to make a special inquiry into the organization of the institute, so as to ensure that it would be a worthy memorial to a great man, but before that could be completed there came a proposal for amalgamation with the London School of Hygiene and Tropical Medicine. The question was first raised by the Goldsmiths' Company, which, before giving a grant to the institute, asked for an assurance from the honorary treasurer, Lord Queenborough, that there was no overlapping of the activities of the school and the institute. At an informal meeting between Sir Austen Chamberlain, the late Sir Walter Fletcher, members of the board of management of the school, and Lord Queenborough and Sir Charles McLeod, representing the institute, it became clear that overlapping occurred widely in the field from which support for both bodies was obtained, and that possibly there was overlapping in other activities. Since that date there have been a number of discussions. Early in their course a large measure of agreement was found, both on fundamentals and on details, and an assurance given that in the event of amalgamation the school would accord the work of the institute its fullest support, both for its own sake and as a memorial to Sir Ronald Ross.

As a result of these discussions, the Board of Management of the School and the Executive Committee of the Ross Institute have decided on the desirability of the amalgamation; and I am issuing this memorandum to explain to members of the institute the reasons which have induced me to come to the conclusion that amalgamation should take place, how it will affect the objects for which the Ross Institute was founded, and something of the school and its associated hospital with which amalgamation is proposed.

Sir Charles McLeod recalls particularly that in the reorganization which led to the creation in London of a great school of hygiene that would be of value not only to Britain and the British Empire, but to every part of the temperate and tropical zones, the long association of the London School of Tropical Medicine and the Seamen's Hospital Society was preserved by a special agreement, which provided that research and clinical instruction should be carried on in their Hospital for Tropical Diseases in Endsleigh Gardens, a few minutes' walk from the school. Turning to the origin of the Ross Institute, he describes how, in addition to being a memorial to Sir Ronald Ross, the fundamental idea was again work for the benefit of mankind. Although the histories of the London School of Hygiene and Tropical Medicine and the Ross Institute have been different, and although each has been developed on somewhat different lines, their fundamental objects, he says, have been identical, and their spheres of work are found to be complementary.

INTERNATIONAL CONFERENCE ON CHEMICAL RECORDS

Industrial and Engineering Chemistry publishes a note by Dr. Austin M. Patterson on a 20-page pamphlet entitled "Recommendations of the Experts Assembled in Paris, September 19 to 20, 1932, by the Office International de Chimie." The office was created by international diplomatic convenant and began to function in 1932. Its headquarters are in Paris. It proposes to study the organization of chemical records, to promote cooperation between the centers of such records in the different countries and to facilitate exchanges and loans.

The delegates present at this first conference were: F. Donker Duyvis, Netherlands; P. Dutoit, Switzerland; F. Haber, Germany; E. Hauser, Spain; C. Marie, France; N. Parravano, Italy; G. Peny, Belgium; J. C. Philips, Great Britain. J. F. Norris,