from the mother to the egg, and from the egg to the offspring, and thereby marking the transmission of the actual substance of the egg, and indirectly of the mother, to the offspring.

3. The precision of the method and its striking results apparently open to biologists a field which has lain dormant since its discovery by Daddi[3] twelve years ago, *i. e.*, the possibility of following with great exactness at least one of the processes of nutrition.[4]

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## *GEOLOGY AT THE BRITISH ASSOCIATION*

THE seventy-eighth annual meeting of the British Association for the Advancement of Science was held at Dublin, September 2 to 9, largely in the buildings of Trinity College and the Royal University. The Lord Lieutenant of Ireland, the universities, and the city cooperated to extend to the visitors a true Irish hospitality. In addition to the presidential address by Dr. Francis Darwin, popular illustrated evening addresses were delivered by Professor Turner, of Oxford University, on "Halley's Comet," and by Professor Davis, of Harvard University, on "The Lessons of the Colorado Canyon."

The mornings only were devoted to the reading of papers, the afternoon hours being wholly taken up by excursions and by elaborate social functions. In the sectional meetings an innovation was introduced in a large bulletin board set up at the front of each room, on which appeared "Papers Now Being Read." Beneath this were placed large letters to designate the individual sections of the association, and under each was a peg on which was hung up the number of the paper which at the moment was being read. A boy in attendance almost noiselessly received the telephonic messages at one end of the presiding officer's desk and adjusted the numbers on the board after the manner in use at American football games. The method proved a success, and might well be adopted by the American Association. As some of the section rooms were rather widely separated, an inter-section service of automobiles running at ten-minute intervals was instituted, but of its success the writer is unable to speak.

The invitation of the city of Winnipeg for the association to hold its meetings of 1909 in that city was brought by Dr. Bryce, vice-president of the Royal Society of Canada, and was accepted. The meetings will be held at Winnipeg during the last week of August and will be followed by an excursion through the Canadian Rockies by special train to Vancouver, B. C., with stops at Banff, Glacier and other intermediate points. To members of the British and American Associations the trip will be made for one fare, or $50, and an excursion from Vancouver to Alaska and perhaps to still more distant points is under consideration. To members of the American Association attending the meetings the usual dues of a sovereign will be remitted, and it is hoped that the occasion will be notable by reason of the large number of British, Canadian and American scientists brought together. As was the case on the occasion of the South African meeting of the British Association, a considerable number of distinguished scientists will be made the special guests of the occasion.

Section C (Geology) was well attended by representative geologists of Great Britain, and the distant dependencies of the empire were represented by Hume, of Egypt; Hayden, of India; Maitland, of Western Australia; Hatch, of South Africa, and Grabham, of the Soudan.

The address before the section was delivered by Professor John Joly, F.R.S., of Trinity College, Dublin, the president of the section, on "Uranium and Geology." It was an able and scholarly address dealing with the recent developments in the study of radio-activity as a factor in geological dynamics, and ascribing to it large importance in the explanation of the earth's interior heat and of mountain growth. Professor Joly's own studies in connection with the great Alpine tunnels, where he found the least quantity of radium corresponded to the greatest depth below the surface, he explained by the radio-active nuclei originally distributed fortuitously through the earth's mass, heating and expanding beyond the capacity of the surrounding material, and in consequence rising to the surface. It would thus seem that it is not necessary to assume such large quantities of radium to be still contained in the core of the earth as are now to be found in its outer shell.

[3] Daddi, in 1896 (*Arch. Ital. de Biol.*, T. XXVI., 1896, p. 143), was the first to show that fat deposited in the living body is stained by Sudan III. when ingested with the food.

[4] The authors wish to express their thanks to the staff of the poultry department of the New York State College of Agriculture for the abundant facilities and assistance placed at their disposal.

Dr. Milne, the veteran earthquake specialist, read a paper on "The Duration and Direction of Large Earthquakes," in which he called attention to an apparent tendency of large earthquake waves to travel farther to the west than to the east, and to an apparent difficulty which they encounter in getting across the equator. Professor W. M. Davis discussed "Glacial Erosion in North Wales," laying stress especially upon the prevalent corrie, the broad valley, and the hanging side valley, as undeniable evidences of the important eroding power of glaciers.

Dr. Tempest Anderson made a report upon "Changes in Soufrière of St. Vincent" based upon a recent trip to the island and upon his earlier visit made just after the great eruption of 1902. Of special interest are the changes observed in the torrent of hot mud which had filled the Wallibu Valley to a height in places of more than a hundred feet. The greater part of this deposit has since been washed away, fragments remaining, however, in a terrace 60 to 80 feet high on the north side of the valley. In general it may be said that in place of each of the earlier valleys there are now found two parallel valleys developed on either side of the mud streams which have filled them. Each present valley thus has for one of its walls the original valley wall and for the other a cliff cut in the ash of 1902.

Professor Lapworth contributed a report upon important revelations made by excavation through critical sections in Shropshire and North Wales. A very interesting case of thrust and crush brecciation in the Magnesian Limestone of County Durham was presented by Dr. Woolacot.

The most interesting feature of the meeting to the geologists was a formal symposium on the subject of mountain building, to which Professor Joly, Sir Archibald Geikie, Professor Lapworth, Professor Sollas and Professor Cole contributed. Professor Joly in opening the discussion focused attention upon the Alpine type of mountain, and credited largely to Professor Lugeon the discovery of the great overturned folds and thrusts of the northern Alps. Radio-activity was brought into the problem so as to connect the areas of mountain elevation with areas of sedimentation. The immediate surface rocks were of such richness in radium as to preclude the idea that a similar richness would extend many miles inward. Now as the sediments grew in thickness this original layer was depressed deeper and deeper, yielding to the load until at length it was buried to the full depth of the overlying deposit. Here the law of increase of temperature with the square of the depth came in, and the effect of the accumulated sediment was thus a reduction in the thickness of that part of the upper crust capable of resisting a compressive stress. Along this elongated area of weakness the crust found relief and was flexed upwards.

In continuing the discussion Professors Geikie and Lapworth took the ground that the revelation of Alpine structure must be largely credited to earlier geologists, and especially to Heim and Bertrand, whose observations and conclusions had been elaborated and very ably presented by Professor Lugeon. By Professor Lapworth mountains were discussed especially in relation to the plan of the earth, the distribution of the great mountain arcs, and the relation of the elevation of shores to the depression of the neighboring sea-bottom, in connection with which treatment he paid a glowing tribute to Eduard Suess.

Professor Sollas described a recent excursion which he had made under the leadership of Professor Lugeon in examination of the great overthrusts exhibited about the lake of Lucerne. The frequent location of active volcanoes at the rear of growing mountain ranges—on the side from which the overthrust was exerted—was explained by the use of Willis's law of competency of structure. The elevation of a competent layer of rock relieved the pressure from underlying rock material, thus allowing it to fuse and shift laterally in the direction of the rear of the fold.

The numerous excursions of the geologists to points in the vicinity of Dublin were most instructive and offered greatest interest to students of structural geology. The excursion of Saturday to the Skerries under the leadership of Dr. Matthies afforded the opportunity of examining a section which revealed in great perfection all the common types of folds, including small recumbent folds and overthrusts. The relation of gashing and healing to the position of arches and limbs was strikingly brought out. Professor Cole and Mr. Seymour conducted another all-day excursion to the Devil's Glen and Glendalough through some of the most picturesque sections of County Wicklow. Here the contact zones of great batholiths of granite in surrounding shistose rocks were well displayed. Other interesting excursions were conducted by Professor Reynolds and Mr. Muff.

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September 26, 1908