

this determination is, I believe, one of the foremost, if not the foremost problem that confronts the behaviorist of to-day, regardless as to whether he is vitalistically, mechanistically or agnostically inclined. This problem may never be solved. The extent to which reactions are determined by material configurations will probably never be precisely ascertained. But our knowledge concerning this can certainly be greatly extended. Our observations and experiments have thus far been largely qualitative. Indeed, we have as yet scarcely begun to apply quantitative methods. In this direction there stretches out before us a vast unknown region full of great promises and enticing possibilities.

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GEORGE JENNINGS HINDE

ON the eighteenth of last March Dr. George Jennings Hinde, F.R.S., F.G.S., died, at the age of seventy-nine. No doubt in time some friend or associate of his will write a personal tribute to the man and his work; I can but speak as one who knew him through his published researches, and it is to these that I would call attention in this brief appreciation.

Hinde was a man who saw nature through a microscope. His life was devoted to the study of minute organic remains so that, as he said of himself, when other paleontologists went into the field armed with hammer and chisel to collect large specimens, he took with him only a magnifying lens.

In the early seventies Hinde, having completed his preliminary education in England, came to Canada where he spent seven years at the University of Toronto under Professor H. A. Nicholson. During that period his researches were more primarily geological than paleontological, his most important contributions dealing with glacial phenomena in western Canada, the glacial and inter-glacial strata of Scarboro Heights and other localities near Toronto, and the terraces of Lake Ontario. But while studying these broader geological problems he was already turning his attention to the well-nigh invisible contents of

the rocks. Near Toronto he discovered in the Ordovician strata conodonts and annelid jaws, while in the Devonian of Eighteen Mile Creek, near Buffalo, New York, he discovered the now famous Conodont bed. Later he found similar annelid remains in the Silurian of western England and in the Lower Carboniferous rocks of Scotland.

Shortly after his return to England, he set out for what was then the paleontological Mecca of Europe—the University of Munich. Karl A. von Zittel had been called to the chair of paleontology at Munich in the early seventies and in less than a decade his fame as a teacher and original investigator had spread throughout the world. His first major contribution to science was his monograph on fossil sponges which appeared between the years 1878 and 1880. In this he laid the foundations of the science of paleospongiology, for he introduced the method of microscopic study of the spicules and skeletal structure, a method which had previously been deemed of no value for fossil forms although it was used for recent sponges. Furthermore, on the basis of these microscopic observations, he made a new classification of the whole phylum, redefined the old genera and described a large number of new ones, covering in this way the whole field of fossil sponges, and, finally, he gave an excellent series of illustrations of the spicules, a thing which had not been done before.

It was during this very period, when Zittel was annually publishing contributions on the structure and classification of sponges, that Hinde went to Munich where he rather naturally undertook, for his doctorate dissertation, a piece of work along the lines then being pursued so eagerly at that university. He had brought with him from England a small nodule from the Chalk of Horstead, in Norfolk, and this supplied him with material for his thesis, for, although the nodule measured only about a foot in diameter, it was found to contain thirty-eight species of sponges, all represented by spicules. These species, many of them new, were described and figured by Hinde in a paper published in 1880, entitled "Fossil Sponge Spicules from the Upper Chalk."

The completion of this piece of research on sponges marked a turning point in Hinde's life. From that time until his death, while he at intervals wrote short papers on other subjects, he devoted himself almost exclusively to the description of the fossil sponges of Great Britain. After receiving the degree of doctor of philosophy at Munich, Hinde was asked by the Keeper of the Geological Department of the British Museum to arrange the large collections of fossil sponges. At first it was thought that the task would not be very difficult but, on account of the necessity of making a microscopic study of the spicules of every specimen and of redescribing each species in scientific terms, it was found that a considerable period of time and extra financial support would have to be allowed for the research, and it is gratifying to note that neither appreciation of the value of such work nor money for its carrying on was lacking. As a result, there appeared in 1883 a quarto volume bearing the title "Catalogue of the Fossil Sponges in the Geological Department of the British Museum." But this was no mere catalogue, no mere listing of numbered specimens with a word or two of description, it was a masterly treatment, the first one of its kind in English, on the anatomy, structure, classification and distribution of fossil sponges, accompanied by illustrations of entire specimens and skeletal elements of all of the more important Paleozoic and Mesozoic genera of sponges in Great Britain, and the work was made particularly valuable by the addition of notes on the occurrence of the British species in other European localities, so that one may learn also of the faunal distribution of the sponges and the stratigraphic correlation of their horizons. The types of a large number of species founded by such early workers as Mantell, Toulmin Smith, Phillips and Miss Bennett were refigured and redescribed so that one need no longer rely upon the unscientific protologs and superficial photographs given by these and other authors. Hinde used Zittel's classification and adopted his method of study of spicules throughout the work, giving to the world a monograph which will always remain a stand-

ard work of reference. In recognition of his service to science in carrying on these elaborate researches the Geological Society of London in 1882 awarded to Hinde the Wollaston "Donation Fund."

The "Catalogue" was, however, only a rather general work covering the sponges of all periods. Hinde next undertook the detailed study of all British species in successive geologic systems. Thus, in 1887 he published in the Paleontographical Society (Vol. XL., 92 pp., 8 plates) the first part of "A Monograph of the British Fossil Sponges." It was the first treatise in any country to contain a résumé and evaluation of the literature on fossil sponges, two hundred and thirty-two papers and books being cited. In addition, it included a careful discussion of the structure and morphological characters of sponges, as well as a description of the types of spicules, and to-day this remains the only book in English where such features are found adequately described. The remainder of this first part and all of the second part (published in 1888) were devoted to the systematic description of the Paleozoic species of Great Britain and the figuring thereof. In 1893 a similar volume (part III.) was published covering the Jurassic sponges, and it was Hinde's intention to take up the very large Cretaceous fauna in the same way. But, unless this fourth part has appeared within the last year or so and copies of it have not yet reached this country, the monograph has not been completed and the most abundant, the most perfectly preserved of the sponge faunas of Great Britain must wait until some new worker appears to carry on this difficult task in a field where only a specialist of first rank would have the temerity to follow such a leader.

In 1897 Hinde was honored a second time by the Geological Society of London which awarded to him the Lyell Medal with the sum of twenty-five pounds in recognition of his researches in geology and paleontology and especially of his discoveries of fossil sponges and other minute organisms. Previously in 1886, he had been made one of the assistant editors

of the *Geological Magazine*, an office which he held until his death

Among his lines of research other than those on sponges may be mentioned those on the fossil radiolaria from the rocks of Central Borneo, on the borings in the Funafuti Atoll, on the Cretaceous entomostraca of England and Ireland, and on the annelid remains in the Siluric of Gotland and in numerous other formations of the New and Old World. But despite the value of these investigations, Hinde's name will always be most closely associated with the development of the science of palaeospongiology. What Zittel did for fossil sponges as a group, Rauff for the Paleozoic species of the world, Počta for the Cretaceous sponges of Bohemia, Kolb for the Jurassic and Schrammen for the Cretaceous of Germany—all this Hinde undertook and largely completed for palaeospongiology in Great Britain. His death not only deprives England of an eminent paleontologist, but it takes from the science of palaeospongiology one of its founders—a man who for four decades devoted his time to the elucidation of the diverse problems connected with the anatomy, taxonomy and geologic occurrence of a group of fossils of which practically nothing was known fifty years ago.

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INQUIRY OF THE AMERICAN GEOGRAPHICAL SOCIETY FOR THE INFORMATION OF THE PEACE COMMISSIONERS

In September, 1917, as a result of conferences between Colonel E. M. House and President Wilson, Colonel House was authorized to organize forces to gather and prepare for use at the Peace Conference the most complete information possible, from the best and latest sources, for consideration by the Peace Commissioners.

The expenses were provided for from the special emergency fund placed by Congress at the President's disposal.

Colonel House held preliminary conferences with Dr. S. E. Mezes, president of the College

of the City of New York; Professors James T. Shotwell, of Columbia University, and Archibald C. Coolidge, of Harvard University, about the broad lines of the work, and its organization, which, after a time, became known officially as "The Inquiry."

It was soon evident that the scope of the inquiry would demand not only a personnel of size and quality hitherto unknown in any such work but headquarters where safety from enemy activity of records and secret documents could be assured. "The Inquiry" has worked in the closest touch with the Military Intelligence Division. There was also needed an already established organization for many kinds of research, mapmaking, etc., which could be immediately utilized. This problem was finally solved when the American Geographical Society placed its building, at 156th Street and Broadway and a part of its staff, including its director, Dr. Isaiah Bowman, at the disposal of "The Inquiry" without cost.

The work from that date, November 10, 1917, got really under way, and has proceeded under careful guard night and day. Such measures were considered vital, owing to experiences at other peace conferences, notably that after the Franco-Prussian war. It was considered necessary, too, to abstain from publication of details of the work of "The Inquiry" until its results were safely on ship-board. A large part of them are now on the way to Europe, and by the time the President, the other peace commissioners and their staffs, together with the twenty-three members of "The Inquiry," arrive in France, the material used will be ready for them. The main body of it left the building of the American Geographical Society in three army trucks on Monday, December 2. Other results of the work are already in Paris, where Colonel House has been arranging the preliminaries of the forthcoming conference.*

Similar inquiries have been in progress abroad, notably in France and England. There have been frequent conferences for delivery of material and exchange of views, marked by a spirit of friendly cooperation