

## BIOGRAPHICAL NOTE

By V. K. TING

The parents of Amadeus W. Grabau were of German origin. His grandfather, a pastor of St. Andrew's church in Erfurt, Germany, migrated to America in 1839, after suffering repeated imprisonment for refusing to conform to the services of the reformed Lutheran church. One thousand of his followers, amongst whom was captain von Rohr, the father of A. W. Grabau's mother, accompanied him to America.

On January 9th 1870 he was born in the village of Cedarburgh, Wisconsin, where his father was pastor of the Lutheran church. He was the second son of a family of 7, two of whom died in their infancy.

He attended first his father's parochial school, and later the Cedarburgh Public High School. At the age of eleven he lost his mother, and 4 years later, when his father moved to Buffalo, N. Y., to take charge of the Seminary founded by his grandfather, he entered the book-binding business in Buffalo as an apprentice, attending the evening school at the same time. He was soon attracted to natural history and spent all his spare time to educate himself. At first he was mainly interested in botany, but his botanical excursions to Eighteen-Mile Creek, south of Buffalo, and to the Genesee Valley at Portage turned his attention to geology and palæontology. He then joined the correspondence course in mineralogy conducted by Prof. W. O. Crosby of the Massachusetts Institute of Technology, who, impressed by his brilliant promise, offered him a post as assistant in the mineral supply establishment at the Boston Society of Natural History which enabled him to enter the Massachusetts Institute of Technology in 1890 as a special student.

At the Institute of Technology he studied geology, mineralogy and physical geography under Crosby, Barton and Niles. At the Society of Natural History he came under the influence of S. Henshaw, J. W. Fewkes, R. T. Jackson and, above all, Alpheus Hyatt, then Chief Director of the Museum of the Society and Curator of Palæontology in the Museum of Comparative Zoology at Cambridge. Henshaw and Fewkes interested him in marine

biology, and Hyatt and later on, Jackson, became his teachers in palaeontology. Hyatt also appointed him as public lecturer at the Society's Museum. In addition to all these duties and classes, he had to attend the evening high school courses at the Boston Latin School in order to pass the entrance examination at the Institute.

Upon matriculation in 1891 he was appointed student assistant in the Geological Department under Prof. Niles. Three years later he published his first scientific paper on *The Pre-Glacial Channel of the Genesee River* in which he had been interested even before he went to Boston. This is the beginning of a series of papers on pre-glacial drainage in which he developed the hypothesis of a southward drainage system in the Tertiary. In 1896 he graduated, and his Bachelor's thesis, *The Faunas of the Hamilton Group of Eighteen Mile Creek*, was subsequently published by the Geological Survey of New York. From 1896-1897 he served as assistant in the Department of Geology in the Institute of Technology giving courses in palaeontology.

Even in his student days he became acquainted with many of the leaders in American geology, including A. Agassiz, Major J. W. Powell, C. D. Walcott, J. Hall, J. le Conte and T. C. Chamberlin all of whom directly or indirectly influenced his career. In 1897 he obtained a scholarship in the Department of Geology at Harvard University which was later followed by fellowships. Although chiefly working with Jackson, then Professor of Palaeontology at Harvard, he came under the influence of two master minds; N. S. Shaler, the last of the old time geologists, and W. M. Davis, the creator of physiography. In 1900 he received his degree of Doctor of Science from Harvard, and his dissertation, *Phylogeny of Fusus and its Allies*, was subsequently published by the Smithsonian Institution. While completing his work for the doctor's degree he held the lecturership of geology in Tufts' College, and during one semester, that of mineralogy and geology at the Rensselaer Polytechnic Institute where he was subsequently appointed professor, but resigned to accept the lecturership in palaeontology at Columbia University in 1901. After one year he was appointed adjunct professor, and three years later, Professor of Palaeontology which position he held until 1919.

In analysing his contributions to science during these years one is struck by his versatility. The accident of living in a fossiliferous region during his

formative years determined his career as a palaeontologist. Western New York is not only rich in fossiliferous formations, but is also abundantly provided with good sections. Eurypterids from the Upper Silurian of the quarries in North Buffalo, corals from the Middle Devonian limestones of Williamsville, Silurian brachiopods, cystoids, trilobites etc. from the Niagara Gorge and fossils from the Hamilton group of Eighteen Mile Creek provided him with rich material for study and identification. Thus his first book was a palaeontological and geological guide to Eighteen Mile Creek in which all the fossils were briefly described and figured. The Niagara and the Schoharie regions were treated in the same way, each accompanied by a coloured geological map.

His palaeontological work is however, by no means confined to descriptive monographs. Intimate contact with Hyatt and Jackson naturally resulted in developing his interest in the phylogenetic problems furnished by fossils. His contribution in this line is mainly on the Gastropoda, especially the Fusidae and their allies. He was the first to point out the importance of the protoconch in classification. Similar studies, though of less extent, were made on corals, crinoids and brachiopods.

Speaking German from his childhood, he is equally at home with German scientific literature. Thus he was the first American geologist to follow J. Walther whose book, *Einleitung in die Geologie als Historische Wissenschaft* led him into bionomy and lithogenesis. His interest in the bionomic relations resulted in the detailed study of Palaeozoic coral reefs, including those of the Silurian on which his native village was built. His papers on the habitat of the eurypterids, and of the Devonian fishes, and on the origin, distribution and preservation of the graptolites were inspired by the same principles.

In lithogenesis the formation of clastic rocks and desiccation deposits especially claimed his attention. In this he was again influenced by Walther's *Gesetz der Wüstenbildung*. His main ideas were first crystallised in a new classification of sedimentary rocks based on genetic principles, which was followed by studies of individual types. As an extension of the principles of Walther he formulated the criteria for recognising the various types of desiccation deposits in the older series in his *Principles of Salt Deposition*, forming

the first volume of his *Geology of Non-Metallic Mineral Deposits other than Silicates*, published in 1920.

Even more original is his introduction of physiography into stratigraphy. As a student of Crosby he early interested himself in the glacial geology in the neighbourhood of Boston. As far back as 1897 he interpreted the sand plains of Cape Cod as formed in successive stages of a glacial lake embayed in the ice front and progressively lowered by the uncovering of outlets across the terminal moraine. Coming under the influence of W. M. Davis, he mapped the successive shore-lines and delta plains of one of the ice-border lakes near Boston which he named Lake Bouvé. In all his works on stratigraphy the development of landforms in older geological periods serves as the key to the distribution of sediments with references to their sources, the formation of larger overlaps and disconformities. The last term was first proposed by him in a paper, *Physical Characters and History of some New York Formations*, published in *Science* in 1905.

Physiography, lithogenesis and bionomy were finally combined and systematised in his great book, *The Principles of Stratigraphy*, published in 1913. Of this the late Professor Barrell said: "Many chapters could be used without change in a work on physiography".

In 1910 he for the first time visited Europe. In addition to attending the International Geological Congress at Stockholm, he spent half a year studying European geology in the field in England, Scotland, France, Germany, Austria and Russia. His paper, *Comparison of American and European Lower Ordovician Formations*, published in 1916, was the direct result of his visit to Europe, but his first-hand knowledge of European geology has left its mark on all his subsequent works. His *Text Book of Geology*, for example, is the only American text-book in which geological formations outside the American continent have received any attention.

In 1920 he was offered by the writer, through Dr. David White of the U. S. Geological Survey, the post of Chief Palæontologist to the National Geological Survey of China to act concurrently as Professor of Palæontology at the National University of Peking, which posts he accepted with enthusiasm. The Geological Survey then had been in existence for 5 years and considerable palæontological material had been accumulated. It was felt that not only

was it urgently necessary to work out the collections in order to lay the foundation of Chinese geology, but also that Chinese students must be trained to undertake independent researches in palaeontology so as to continue the work in the future. To him therefore was entrusted the double task.

As a teacher his success was immediate and complete. Although his lectures were delivered in English to Chinese students who had never been outside their own country, he soon attracted many brilliant young men to his classes. His inspiring enthusiasm, hard work and clear exposition won for him not only the respect but also the love of his pupils. The fact that out of the 25 monographs written for the *Palaeontologia Sinica* by Chinese palaeontologists, 19 were written by men who owed their training to him, speaks more than anything else for his contribution to the education of the younger generation of Chinese geologists.

With regard to descriptive palaeontology, these years have been very productive: 9 papers have appeared in the *Bulletin of the Geological Survey* and that of the *Geological Society*; 5 monographs have been published in the *Palaeontologia Sinica*, 5 more are ready for printing. In the meantime he also worked out the Permian Fauna of the Jishonguer limestone of Mongolia collected by the Central Asiatic Expedition of the American Museum of Natural History. The total number of published pages amounts to more than 1,800, and the subjects range from Cretaceous ammonites to Ordovician corals.

Characteristically he was not satisfied with descriptive palaeontology as such. He inevitably systematises his palaeontological work into scientific stratigraphy. In his monograph on the Permian of Mongolia the whole Permian question of the world was discussed in all its aspects with characteristic insight and originality. Within four years of his arrival in China the first volume of *Stratigraphy of China* appeared. The second volume followed 4 years later. With German thoroughness he summarised all existing data, stated problems and formulated working hypotheses. It serves as a compendium for all Chinese geologists as well as a text-book for his students. When one of his own pupils succeeded in disproving some of his hypotheses, he was more delighted than any one else, and said rightly that the greatest pleasure of a teacher was to have his mistakes corrected by his own pupils.

Nor did he neglect his favourite researches begun in America. The migration of geosynclines, first outlined in a short paper in 1919, was further elaborated in full in 1924. Part V of *Studies of Gastropoda* appeared in 1928. Only some of the problems bear more local colour: he now constructs palæogeographical maps of China instead of America and speculates on Asia and the evolution of man.

During the ten years he has been in China he spent only one short holiday at the seaside of Peitaiho, and, as a by-product, published jointly with S. G. King a booklet on the *Shells of Peitaiho*.

He took an active part in the organisation of the Geological Society of China, and in 1925 was awarded by that Society the first gold medal founded in his honour.

He married Mary Antin in 1901 and has one daughter Josephine Esther.

*Scientific career and honours*

- 1890. Appointed assistant in the Mineral Supply Establishment at the Boston Society of Natural History.
- 1891. Metriculation at the Massachusetts Institute of Technology. Appointed student assistant in the Geological Department.
- 1896. Took the degree of Bachelor of Science. Appointed assistant in the Geological Department.
- 1897. Entered Harvard University.
- 1898. Took the degree of Master of Science at Harvard. Elected fellow of the Geological Society of America.
- 1899. Appointed lecturer on geology in Tufts' College.
- 1900. Took the degree of Doctor of Science at Harvard. Appointed Professor of Geology at the Rensselaer Polytechnic Institute.  
Appointed member of the Geological Survey of Michigan.
- 1901. Appointed lecturer in palæontology at Columbia University.  
Elected Fellow of the New York Academy of Science.  
Appointed member of the Geological Survey of New York.
- 1902. Promoted to adjunct Professor at Columbia.

- 1905. Promoted to Professor of Palæontology at Columbia.
- 1910. Travelling in Europe.
- 1920. Appointed Chief Palæontologist of the National Geological Survey of China and Professor of Palæontology of the National University of Peking.
- 1922. Elected Fellow and Councillor of the Geological Society of China.
- 1923. Appointed Research Associate of the Central Asiatic Expedition.
- 1924. Elected Honourary member of the Science Society of China.
- 1925. Elected member of the Kaiserlich Deutsche Academie der Naturforscher zu Halle.
- Awarded the Grabau Medal by the Geological Society of China.
- 1927. Elected Honourary member and Life Councillor of Peking Society of Natural History.
- 1928. Elected Correspondent of the Philadelphia Academy of Natural Science.
- 1929. Elected Research Associate of Academia Sinica.

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