Proceedings of the Society*

BY THE SECRETARY

The Second Genaral Meeting

April 15th, 1922.

Dr. W. H. Wong, Vice-Presiden , in the chair.

This was not only a regular meeting, but also a gathering to welcome the Japanese palæontologist, Dr. I. Hayasaka, who recently came to study the geology of northern China with his students of the Tohoku Imperial University. After the meeting was called to order by the Chairman, the following communications were read.

Jade, its Historical Value to the Chinese People and its Nomenclature

H. T. CHANG

Read by Dr. A. W. Grabau in absence of the author. The full paper will be published in the bulletin.

A General Sketch of the Geology of Japan

I. HAYASAKA

(Abstract)

In the so-called Chichifu formation in Japan, which has long been known as a Palæozoic series, some Mesozoic fossils were recently found. Therefore a part of the formation must be of the Mesozoic age.

In the upper part of the Asukigawa valley some striated pebbles were once discovered by a German geologist, Dr. Heetner, who believed them to be of glacial origin. The same conception was also held by Dr. N. Yamasaki, but it was disproved by Dr. M. Yokoyama by the discovery of some faunas of warm water habit and he suggested that the striation might be the result of landslide, and not of glaciation. Quite recently, some students of the Tohoku Imperial Univerity have collected some fossils and according to my study a majority of them is of cold water habit. Probably glaciation did happen to the region.

A detailed description of the fossils will be published by the author. Address delivered in Japanese and translated by Prof. J. S. Lee. Discussed by Dr. A. W. Grabau.

* Partly recomposed by the editorial staff.

Earthquakes in China§

W. H. WONG

(Abstract)

As is well recognised by all geologists, the important earthquakes in the world usually take place within the two prominent seismic belts, one of which surrounds the Pacific Ocean, following the western coast of North and South America and the island groups along the eastern coast of Asia, while the other includes the Mediterranean, the Alps, the Caucasus and the Himalayas. China lies outside of the two zones; consequently, Montessus de Ballore does not believe that the earthquake records in Chinese history are reliable, although he used them to make his seismic map showing the distribution of epicenters which, according to his method, were located by frequency. The result is that the more populated places such as the capitals and large cities, where records are comparatively complete, become the epicenters which distribution can not show much about their real relations to the main geological structures.

The Japanese seismologist, Dr. Omori, has also made a seismological map of China in which are mentioned only two epicenters, the northern Shensi and the southern Szechwan. As far as I know, there is no reliable center in N. Shensi. Furthermore, the fact that in his map the geosynclinal line of the Mediterranean zone passes along the coast of Fukien is not in accordance with the geological data so far as they are known.

Now I have constructed a map showing the distribution of earthquakes in China of which the epicenters are located on the basis of intensity but not merely on the frequency. For this purpose the catalogue compiled by Huang and completed by Tober and Gauthiers has been of great help. To this have been added the historical records of Kansu which I have recently published. Modern quakes like those of 1917 in N. Anhui, 1918 in Fukien, and 1920 in Kansu have fully confirmed the importance of the earthquake phenomena in China. The total number of earthquakes, historic and modern, which I have carefully considered, amounts to about 3500, of which about 250 have their effects recorded in sufficient details to enable the localization of the epicenter on the maps. The map thus obtained reveals very well the relation of the epicenters to geological structure of the corresponding regions.

§ A paper entitled "L'influence seismogenique de certaine structures geologiques en Chine" illustrated by several maps was sent to the XIIIth International Geological Congress in Bruxelles and will probably be published in the Compte Rendu of the Congress.

The chief epicentral zones may be summarized as follows. The Fen-Ho—Wei-Ho graben in Shansi and Shensi is formed by the Tertiary faulting. A great number of epicenters are situated in the zone and have caused severe destructions in historical times. Similar to this is the belt of eastern Yunnan where the lake regions from Tung Chuan southward to Kien Shui are nothing but downthrow blocks limited by the peripheric faults. In western Yunnan, in the region of Ta Li, the same relation may be found, though the geology of that region is not yet well known.

Along the margin of the alluvial plain of Peking, faulting or warping most probably has occured. Therefore epicenters are located here and there. The eastern foot of Tai Han Shan, the southern foot of Yeh Shan north of Peking and the south western limit of Shantung massif belong to this group. The valley of Wei Shui in middle Shantung is also an example.

Along the eastern coast of China, the epicenters occur in the region of Teng Chou in Shantung, the coast between Chuang Chou and Swatow in Fukien and that between Hai Nan island and Lei Chou peninsula in Kwantung. They all seem to be broken down by some recent geological movement. The earthquake area of 1918 in the province of Fukien trends parallel to the coast, showing how the seismic center is closely related to the geological structure.

Another group of epicenters bears close relation to the structure of the Tsin Ling ranges. The Tung Po Shan in northern Anhui, following down the Fou-Niu-Shan, runs from NW. towards SE. and makes a sharp turning towards NE. somewhere between Lou An and Hou Shan. The turning point is broken and becomes an epicenter. The earthquake which took place in early Spring of 1917 originated in that region.

In the district of Wu Tu of Southern Kansu occure a similar turning point, east of which the Tsin Ling mountains trend E-W. Starting from Kansu, the metamorphosed formation bends towards the NW. In the year 1879 intensive shocks took place in that region and since then earthquakes have continued for several years.

Besides, other earthquake centers are related to overthrusts. For example, in northern China is the belt of Ho Lan Shan (often confused with A-la-shan). The zone between Ping Lo on the north and Tsung Wei on the south was subjected to a terrible disaster in the year 1738. Southern Szechwan is another example of this group. The overthrust was once assumed by Deprat and has been actually observed by V. K. Ting. That is what Omori designated as epicenter B in his seismic map of China.

A Study of the Post-Carboniferous Formations in Shansi

C. C. WANG

(Abstract)

The exposure of the post-Carboniferous red sandstone in Shansi covers a wide area with a clear sequence. So far as I know the red rocks often occur as two separate formations in northern Shansi, of which one is lying on the Jurassic coal series, while the other exists below the Jurassic and above the Carboniferous strata. Only the latter, which has been designated by von Richthofen "Ueberkohlen Sandstein", is to be taken as the subject of my present discussion. In previous studies, the red sandstones have generally been considered a unit and of doubtful age, because of the absence of fossils. But they appear now to be easily separable into three subdivisions, and these may be distinguished from one another by their lithologic characters. I studied the red formation in two places. First in 1917 I met it during a reconnaissance survey from Yü Tze (榆次) to Ho Chung (和順), in central Shansi. Next in 1921 I collected fossils in its lower part in Pao Fê Chou 保德州, northwest Shansi.

The journey of 800 li between Yü Tze and Ho Chung I completed in 4 days and so only a rough stratigraphical research was possible. Some of my observations on the of Ho Chung are given in the following.

In the neighbourhood of Ho Chung city there are gentle rolling hills with black rocks cropping out in the adjacent valleys. All the facts reveal the presence of the Carboniferous coal measures. Not far to the west, the contours of the hills change into a higher level and interbedded yellow or green shale and white or greenish gray sandstone are met, often giving a yellow tint to the slope of the hills. Beyond the yellow hills, the red rocks appear. Thus the yellow beds represent a transition between the black and the red ones, and my suggestion is, that they may be called a transitional formation. The thickness of these beds in the Ho Chung district is probably more than 200 m. In the Lu Tzai(潞澤) region, in southeastern Shansi, this seems to have increased. At Pao Tê chou it is estimated at about 160 m. From this I conclude that it becomes thinner and thinner from south-east to north-west in Shansi. While in the Ho Chun district I had not sufficient time to collect the fossils, last year at Pao Tê Chou I discovered four horizons of plant fossils in this formation. The collection has already been transported to Sweden to be determined by Dr. Halle, but from the general aspect of the fossils, the formation is regarded as probably belonging to the Permian system.

Upon the transitional formation rests a series of red shales and reddish green sandstones which occasionally contains a few fossil-bearing layers of greenish gray shale or white-gray sandstone. Near Hu Sung Tsun (胡 松 村) west of the Ho Chun district, some fossil prints were discovered in this series which is consequently called the Husung series. It has a thickness of about 1000 m. at Hu Sung Tsun, and about 300 m. or more at Pao Tê Chou where a collection of plant fossils from five different horizons has been made. One of the fossils collected appears to belong to the genus, *Altezamites* which would indicate Triassic age.

The Ho-sung series is succeeded by a formation which is predominantly composed of sandstone, called Matou (馬 斗) formation; the name being derived from Ma Tou Kuan (馬 斗 關) of Ta Ning Hsien (大 甯 縣), western Shansi. It consists of greenish or white sandstones in the lower part and light red sandstones in the upper, but both are interbedded with thin layers of red shale. The thickness of the formation along the Huang Ho (黃 河) valley is more than 1000 m. but in the Ning Wu (寧 武) coal field it is only about 900 m.

The distinction between the Matou and the Husung series may be summarized as fallows: (1) The red shales in the Husung series are comparatively thicker and often form the red and gently undulating hills while in the Matou formation the sandstone takes an important rôle and mostly forms precipitous cliffs. Finally, in their topographic expression the two divisional formations frequently show their natural boundaries. (2) The plant fossils are well preserved in the Husung series, but, so far as my present knowledge goes they are absent in the Matou formation. The most important rock in the Matou formation is a light red or grayish arkose sandstone composed of plagioclase, quartz and mica. This arkose sandstone is the characteristic rock in the formation. In regard to the geological age, the Matou formation might still be Triassic. In the Ning Wu coal field it is conformably overlain by the Lower Jurassic coal series which is beyond the scope of the present dicenssion.

The Nature and Extent of a Stratigraphical Break in the Cambro-Ordovician Limestone of Northern Anhui, and its Bearing upon the Systematc Classification of the Cambro-Ordovician Strata

J. S. LEE

The full paper will be published in the bulletin.

The Sinian System

A. W. GRABAU

Discussed by Prof. J. S. Lee and Dr. W. H. Wong. The full paper will be published in the bulletin.

The Third General Meeting

May 26th, 1922

Dr. H. T. Chang, President, in the chair.

After the meeting was called to order the following communications were read.

1. Some points of interest in the first three week's work of the Third Asiatic Expedition, illustrated with latern-slides, by Dr. D. Black.

2. Research on the Cenozoic of Northern China, by Dr. J. G. Andersson.(1

3. Evidence of Pleistocene Glaciation in China, by Prof. J. S. Lee.(2

The Fouth General Meeting

September 29th, 1922

Dr. H. T. Chang, President, in the chair.

After the meeting was called to order, the President H. T. Chang delivered a short speech in Chinese, stating that the meeting was especially held to welcome the American geologists who had just returned from their successful research in Mongolia.

Then Dr. V. K. Ting was called upon to give a welcome address in English.

Mr. Roy Chapman Andrews, leader of the party, was introduced first. He stated the purpose of the research and gave an account of the spirit of cooperation of his staff.

Dr. C. P. Berkey dwelt particularly on the different geological formations encountered. He also drew a columnar section and with the balopticon projected a few pages of his note-book showing the structural sections of the country.

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1) See Memoir Series A. No. 3, Geol. Survey, China.
2) See Geol. Magazine, London, Vol. LIX, pp. 14.

Prof. F. K. Morris spoke next on the topographic and physiographic features of the area traversed, and projected on the screen some sketches and maps made in the field.

Dr. W. Granger, the palæontologist of the party, spoke on various finds. Especially interesting among them, were the Dinosaurs which might belong to the Cretaceous age. He exhibited some specimens showing the patience and technique required in collecting weathered vertebrate bones.

Then Dr. J. G. Andersson expressed his warm congratulation to the four guests.

The discussion of the evening was started by Dr. V. K. Ting after Dr. Berkey's speech. At the end Dr. Andersson spoke more fully on the same topic, staling that the formation found in Mongolia which were regarded as of Cretaceous age bear the same relation to the underlying beds and contain somewhat the same fossils as the upper Jurassic in the Western Hills near Peking. It was suggested that they were probably the same beds and that their time range should be left to future research.

THE FIFTH GENERAL MEETING

November 6th, 1922.

Prof. J. S. Lee, Vice-President,
in the chair.

Dr. E. Ahnert, Director of the Far Eastern Geological Committee was the chief speaker of the evening. He outlined the recent work of Russian geologists in the Russian Far East, showing that in spite of the great difficulties under which they worked much has been accomplished in making the geological observations and examining the mineral deposits.

Drs. Grabau and Andersson and Prof. Morris joined in the discussion.

The next speaker was Dr. A. W. Grabau who gave an account of his study of the Devonian Brachiopods. "These studies", said Dr. Grabau, "indicate that in Devonian time China was the center of radiation of many of the Brachiopoda which migrated on the one hand into western America and on the other into central Europe".

Mr. C. Y. Wang and Prof. F. K. Morris joined in the discussion.

Then the chairman, in introducting Dr. W. H. Wong, the next speaker, said, "It is the first time that the Chinese Government sent a geologist to the International Geological Congress. Dr. Wong was the delegate to the Thirteenth Congress just held at Brussells and he was elected one of the vice-Presidents and a member of the Council of the Congress,"

Dr. Wong gave an account of the proceedings of the Congress and reported that all the contributions from the Geological Survey of Chino were put on the program. These were V. K. Ting's paper on the tectonic geology of Yunnan, W. H. Wong's paper on the geological conditions of the earthquake centers in China, W. H. Wong and A. W. Grabau's paper on the Carboniferous formations of China and J. G. Andersson's paper on the Cenozoic deposits of China.