MEMORIAL VOLUME DEDICATED TO PROFESSOR ENZO KON'NO

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Professor Enzo Kon'no was born on October 24, 1898 as the third son of Teiji Kon'no a landowner in Higashine City, Yamagata Prefecture. He received his early education in his home town. After majoring in science in the Second High School in Sendai City, Miyagi Prefecture, he entered the Department of Geology, Faculty of Science, Tokyo Imperial University where he majored in geology and paleontology, graduating therefrom in March 1923.

Upon graduating from the Tokyo Imperial University he took to teaching and from April 1923 to March 1925 he was chief researcher and lecturer in geology and mineralogy in the Shizuoka High School in Shizuoka City, Shizuoka Prefecture. In April 1925 he was appointed Professor and lectured in geology, mineralogy and geography, a position which he held until May 1941. During this time he was chief researcher in geological sciences. In June 1941 he was invited to the Kyushu University as Professor in the Department of Geology, Faculty of Science, where he held the Chair in General Geology, but also lectured in paleobotany. From June 1948 to date he held the Chair in General Geology in the Institute of Geology and Paleontology, Faculty of Science, Tohoku University, where he also lectured in paleobotany.

Dr. Enzo Kon'no's scientific career had already begun early in 1922 when still a student in the Department of Geology, Faculty of Science, Tokyo Imperial University. From June to September of 1922 he was appointed research member by the Government General of Korea for investigation of the coal-fields of the Mandalsan district east of Peiyang where Paleozoic formations are developed. This work became the thesis which he submitted to the Department of Geology for graduation. This also became his lifework which involved the geology, coal-geology and paleobotany of the chief coal-bearing formations of the Younger Paleozoic and Older Mesozoic Eras.

After graduation from the Tokyo Imperial University in 1923, he was appointed Lecturer in Geology and Mineralogy in the Shizuoka High School where he remained until being invited and appointed Professor of the Kyushu University in 1941. During his 17 years residence in Shizuoka he utilized about two months each year for field work on the Younger Paleozoic and Older Mesozoic coal-bearing formations of the Peiyang coal-fields and of North Korea. His work was concentrated on the stratigraphy, geological structure and paleobotany. In the Peiyang coal-field district there are developed formations ranging from Pre-Cambrian to Lower Cretaceous in age, superposed in complicate fashion and have been sliced with thrust faults, overturned by folds and make an intricate structure. The systematic study of the geostructures resulted in his proposal of the Taiho Disturbance which age is post-Upper Jurassic and pre-Lower Cretaceous. Kon'no in 1928 published the results of his study on the geostructure in the Journal of the Geological Society of Japan under the title of "On the geological structure of the western marginal region of the Heijo coal-field", and was honored with the Society's award. In 1929, he published a paper on *Tingia* and *Tingiostachya* n. gen., both of which were accepted by the paleobotanists of the world and mainly upon which the new Order *Tingiales* was established by Browne, 1933. The descriptions and illustrations of these are incorporated in many text-books on paleobotany, and this shows the high talents he had in paleobotany.

The coals intercalated in the Younger Paleozoic and Older Mesozoic formations of

Korea owing to intense compression by folding have been altered to powder coal. It was clarified by Professor Kon'no that this powder coal was subjected to migration from its original position by flowage along fault planes and other fractures to become consolidated later. This finding became important in the exploration and exploitation of coals and contributed to the technical development.

After being appointed Professor in the Department of Geology, Kyushu University to take the Chair in General Geology, Stratigraphy and Coal Geology, he extended his studies from Korea to Manchuria concentrating on the Younger Paleozoic and Older Mesozoic coal-bearing formations, and also enlarged his field to include the Triassic and Jurassic coal-bearing and plant-fossil bearing formations as well as of the Lower Tertiary and Pleistocene coal-bearing formations of Yamaguchi Prefecture and northern Kyushu. During this time he supervised the students of the Department of Geology, Kyushu University in their field and laboratory works on the mentioned coal-bearing formations and obtained interesting and valuable results.

During the three years of 1942 to 1944, he collected fossil plants, horizon by horizon, from the continuous geologic column extending from the lowest horizon of the Permian to the lower part of the Upper Permian in the Penchihu coal-field of Manchuria. This collection is particularly valuable because it reveals the successive changes of the Permian flora of Eastern Asia. This collection is now preserved in the collection of the Institute of Geology and Paleonotology, Tohoku University.

In Eastern Asia during the Permian there was the Cathaysian Flora, in Siberia including Vladivostok was the Angara Flora, and in India there was the Gondwana Flora. These three floras were considered as independent of one another and their interrelationship remained unknown. However, Kon'no was successful in collecting the fossil plants necessary for determining their interrelationship. As the result Professor Kon'no proved that the Gondwana elements as *Schizoneura* and *Rhipidopsis* occur in the Cathaysian Flora, invading therein during the younger Upper Permian. And, to determine the position of the boundary between the Angara and Cathaysian floral provinces, Kon'no spent many years, but in 1943 he was successful in being able to determine that boundary. At Kaishantun in Chientao Province in eastern Manchuria about 200 miles west of Vladivostok, Cathaysian floral elements as *Gigantopteris*, *Lobatannularia* and *Emplectopteris* and Anagara elements as *Brongiartites* occur as a mixed flora. This was called the Kaishantun Flora and a preliminary report on it was published in 1947 in the Journal of the Geological Society of Japan. Thus Kon'no proved that the boundary between the Cathaysian and Angara floral provinces passes through the vicinity of Kaishantun.

In 1944, Professor Kon'no utilized about 50 days in collecting fossil plants from the Older Mesozoic coal-bearing formations in the Tachingshan coal-field beyond Paotao in Jehol. These exceedingly well preserved plant fossils which would serve to interpret the relation between the Older Mesozoic floras of North China, Japan, Turkestan and western Europe were unfortunately lost during the disturbance prior to and immediately after World War II.

On the other hand the fields for the students majoring in geology in the Kyushu University were selected in the area of distribution of the Triassic and Older Tertiary coal-bearing formations in Yamaguchi Prefecture and northern Kyushu. As a result it was clarified that in the geological column of the Upper Triassic coal-bearing formations of Ladino-Carnic or Lower Noric in Yamaguchi Prefecture abundant plant-bearing horizons are intercalated. And, in the Upper Triassic deposits of Yamaguchi Prefecture there are also several horizons rich in important leading marine fossils as *Entomonotis*, *Halobia*, *Oxytoma*, etc., which have been studied by T. Kobayashi and others. For this reason the Upper Triassic plant fossils are highly valuable for universal recognition. Kon'no was fortunate in being able to collect abundant plant fossils, horizon by horizon, from the Upper Triassic deposits. The Carnic-Noric flora had been studied by many students in Japan and it was recognized that although it contains elements of the Permian Cathaysian Flora, it also was clarified that it involves quite new Mesozoic types. Since the Eurasian Triassic mainly consists of rocks formed under an arid climate, its flora is of a particular type and few in number of species, and most of the typical Mesozoic elements first appear in the Rhaeto-Liassic. This cosmopolitan Rhaeto-Liassic flora of the northern hemisphere had already appeared with luxuriant growth in the early Carnic in Japan where the climate was of high temperature and humidity. That ancestral forms of the cosmopolitan Rhaeto-Liassic flora of the northern hemisphere had already existed in Japan during Carnic time is largely due to the studies of Kon'no who recognized many of those elements in the Japanese Carnic flora. In the northern hemisphere especially Euro-America owing to the prevailing arid climate during Permian and Triassic the number of species and individuals of plants are exceedingly few for which reason interpretation of the floral change from the Paleophytic to the Mesophytic Eras is rendered difficult. However, in Eastern Asia particularly the western Pacific coastal region there are known rich Permian and Triassic floras and their collection and research should be done to clarify the problem. Kon'no was successful in making a large collection of Permian floras from the Sakmarian to Kazanian of Manchuria and Korea and of the Upper Triassic floras from the Carnic to Noric of Yamaguchi Prefecture, all of which have been subjected to research. But unfortunately the disturbance immediately before and after World War II delayed publishing of his works and further collection of Permian and Lower Triassic Floras.

In 1948, Professor Kon'no took over the Chair in General Geology and Structural Geology in the Institute of Geology and Paleontology, Tohoku University. From this time he concentrated on his research of the collection of the Permian and Older Mesozoic floras from Manchuria and Korea and also of the Upper Triassic floras from Yamaguchi Prefecture. Supplemented with the rich library and collection of fossil plants preserved in the Institute of Geology and Paleontology, Tohoku University, and of the newly collected materials from the Permian and Triassic formations, his research is being continued to date and the results are being published from time to time.

Professor Kon'no who is a quiet amiable man does not smoke but enjoys light drinking with friends and discussing matters of a wide variety. In the laboratory he is always found working on fossil plants with his glasses lying some place on the table which is strewn with specimens and literature among which papers and documents of official business are sometimes mingled. This shows that his deep interest in fossil plants was most important to him. That his views in paleobotany have been included into textbooks of universal usage shows the remarkably high talents of his work. Also the exceedingly large collection of fossil plants which he collected horizon by horizon even in areas of intensely complicated geological structures reveals his ability in structural geology, earnestness and efforts towards the progress in paleobotany. His many years of field works with the intensely complicated geostructures of the Heijo coal-fields in Korea and the Permian and Triassic formations in Southwest Japan have been fruitful in his collection of plants horizon by horizon from formations with intricate geostructures. Besides being a specialist in paleobotany and structural geology he had deep interest in problems related with general geology, a branch of geoscience which geologists generally do not spend much of their time.

Because of his extensive knowledge in branches of geology and paleontology, Professor Kon'no was stern in his directions to the young men of the faculty and to students, but was always willing to join in discussions and his kind advices are deeply appreciated by those who have had the opportunity to receive his teachings. His readings in geological science was broad as is shown by his interest in subjects covering a wide field. Many persons now active in geology and paleontology including those employed by universities, research institutions, oil and coal-mining companies or in the teaching profession in Japan, are indebted to Professor Enzo Kon'no.

Professor Enzo Kon'no is a distinguished and eminent paleontologist and his name has been given to different phyla of the animal and plant kingdoms, such as to Ordovician Gastropoda, Carboniferous Protozoa, Younger Cenozoic Pelecypoda and Bryozoa, and to Permian and Younger Tertiary plants.

All of the persons who have come into contact with Professor Enzo Kon'no sincerely hope that he will now find time to work on his rich paleobotanical collection and to do things that his official duty kept him away from.

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Scientific Achievements of Professor Enzo Kon'no

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Latest Paleobotanical Studies of Professor Kon'no

Professor Enzo Kon'no at our request has submitted several of his latest paleobotanical works for publication in this Memorial Volume.