INTRODUCTION

The bibliography consists principally of two parts: Paleozoic and post-Paleozoic. For the Paleozoic part fusulinacean literature has been compiled by T. Ozawa and his collaborators; most of the bibliographic data of smaller foraminifera have been assembled by Y. Okimura and S. Adachi, independently. The post-Paleozoic part is the work of Y. Takayanagi, with support provided by many Japanese colleagues. As a part of the introductory note of this bibliography, the historical development of foraminiferology in Japan is outlined in prospect and retrospect in order to provide a stepping stone toward the further development of this scientific discipline.

ACKNOWLEDGMENTS

This bibliography could not have been produced without the co-operation of many colleagues of mine, and I am grateful to all those who have helped me at various stages of its preparation. In particular I thank Kunihiro Ishizaki and Tsunemasa Saito for reviewing the manuscript. My sincere thanks are also extended to Shiro Hasegawa who assisted in computer programming the bibliographic data and to Eiko Hasegawa for her thorough and able assistance in bibliographic compilation. Valuable data and information were provided by Shuko Adachi, Naoaki Aoki, Shiro Hasegawa, Akio Hatta, Masako Ibaraki, Noriyuki Ikeya, Kennichi Ishii, Yasufumi Ishiwada, Kunio Kaiho, Michio Kato, Hiroshi Kitazato, Kenji Kurihara, Seijuro Maiya, Yasumochi Matoba, Kuniteru Matsumaru, Hiroshi Nishi, Ritsuo Nomura, Motoyoshi Oda, Kimihiko Oki, Yuji Okimura, Tomowo Ozawa, Tsunemasa Saito, Yoshiro Tai, Hiroshi Ujiié, Hisato Yasuda, and Saburo Yoshida.

INTRODUCTION

It has long been thought that the first scientific achievement on foraminifera from Japan is the work by Schwager (1883), who described fusulinids from "the Carboniferous of Tarui" (It was proved later to have come from the Permian Akasaka Limestone). However, C.W. Gümbel was in fact the first one to do research on Japanese materials and proposed *Fusulina japonica* with a brief description but no figure in a journal, *Das Ausland*, in 1874. This species was then redescribed and illustrated for the first time by Schwager (op. cit.). Taking account of these circumstances, *Pseudofusulina japonica* (Gümbel) [=*Fusulina japonica*] is adopted as a symbol mark for the 4th International Symposium on Benthic Foraminifera, 1990.

On the other hand, Matajiro Yokoyama was the first Japanese worker who engaged himself in a foraminiferal study. He studied paleontology especially in Europe and later took up the chair of paleontology at the Imperial University of Tokyo. Though his activity was not limited to foraminiferology but rather developed much interests in molluscan paleontology, he described 15 species of smaller foraminifera from "Cretaceous" rocks in Hokkaido (Yokoyama, 1890), and three species from the Jurassic System in Sakawa, Kochi Prefecture (in Naumann und Neumayr, 1890). Both papers appeared in a German monograph series, *Palaeontographica*. His so-called "Cretaceous" foraminifera were later assigned to the Paleogene (Matsumoto, Hayami and Asano, 1963), but one of his Jurassic species, *Cyclammina lituus*, was designated as the type species of the

genus *Pseudocyclammina* by his followers (Yabe and Hanzawa, 1926). With due respect of his pioneering works amongst the Japanese, the year 1890 may be chosen as the dawn of foraminiferology in Japan.

A HISTORICAL SKETCH OF FORAMINIFEROLOGY IN JAPAN
—— Centered Upon Studies on Post-Paleozoic Foraminifera ——

Period from 1901 to 1944

During the transitional phase beteween the 19th and 20th centuries, studies on foraminifera were chiefly pursued by Hisakatsu Yabe, an active paleontologist. He published several papers which dealt with larger foraminifera of Paleozoic to Cenozoic ages and also described late Cenozoic smaller foraminifera. In 1912, he was appointed professor of Tohoku Imperial University which was founded in Sendai in 1907. Since then he endeavored to develop active research on geology and paleontology. During nearly a decade since 1921 he published more than 20 papers on larger foraminifera under the joint authorship with Shoshiro Hanzawa, who was Yabe's first student in foraminiferology. In a historical sense, we may call these days "the age of Yabe and Hanzawa". They covered, independently or in close collaboration, fossils from such wide regions as the northwestern Pacific, Indonesia, the Philippines and Taiwan in addition to the Japanese Islands. Their scientific activities motivated a number of people to study foraminifera of southeastern Asia and Pacific regions. Among the scientists directly influenced by Yabe, Shosiro Hanzawa and Yoshiaki Ozawa are the most distinguished. Their subject of activities extended from late Cenozoic smaller foraminifera to Paleozoic fusulines. Hanzawa bent his study mainly to Tertiary larger foraminifera and brought to light the characteristics of Pacific faunas during his long academic life. On the other hand, Ozawa devoted himself to studies both of smaller and larger foraminifera during his short lifetime. After his epoch-making study of the geologic structure of the Akiyoshi Limestone based on a fusulinid biostratigraphy (1925), he undertook systmatic analyses of the Polymorphinidae in collaboration with J.A. Cushman, the foremost authority of foraminiferal research at that time. Their joint work on this group, which appeared in 1930 after the premature demise of Ozawa, may be regarded as one of the classical works in the foramininiferal classification. It seems to be remarkable that both Hanzawa and Ozawa were able to work with Cushman at the then renowned Cushman Laboratory for Foraminiferal Research.

From the 1920's to 1930's, some events occurred in the U.S.A., as if they signal a bright future in foraminiferology. In 1924, the journal *Contributions from Cushman Laboratory for Foraminiferal Research*, the predecessor of the *Journal of Foraminiferal Research*, was founded. Cushman (1928) set forth the first edition of "Foraminifera: Their Classification and Economic Use". Five years later in 1933, Galloway published "A Manual of Foraminifera". The *Journal of Paleontology*, which started in 1926, was also an important medium for foraminiferal researchers to disseminate results of their work especially in those days. Such academic movements were apparently linked to economic demand for the exploration of oil and gas resources.

In the history of fusulinacean studies, Japan saw florescence during the years from 1930 to 1942 and again a similar period from 1946 to 1960. Since then a remarkable reduction occurred in the number of researchers, especially among