*The Carboniferous Foraminifera from the Sosan District, North Heian-Dô, Tyôsen**

By

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During their survey of the Sosan area in 1931 Prof. T. KOBAYASHI and Mr. Shôen KIN¹⁾ discovered a small lens of dark grey "*Staffella*" limestone on the northeastern road-side of Shinmakudô, Nanmen, Sosan-gun, North Heian-Dô. The limestone-bearing formation lies on the Tofangian limestone disconformably on the west side and is cut by faults on its northeast and southeast sides. It occupies a small area within the Cambro-Ordovician terrain and consists of the lower part of fine purple shale and the upper of reddish purple sandstone, and the fossiliferous limestone-lens is found near the top. Finding the primitive fusulinids in the limestone, they referred this thin formation (some 30m. thick) to the lower part of the Kôten Series.

By courtesy of Prof. Teiichi KOBAYASHI of the Geological Institute, Imperial University of Tokyo, I had an opportunity of studying his thin sections of the limestone during my stay at the Institute in this summer.

Here I wish to express my most sincere gratitude to Prof. KOBAYASHI for his valuable suggestion given to me in his laboratory. My best thanks are also due to Prof. Haruyosi HUZIMOTO of the Higher Normal School of Tokyo for his kind advices on my palaeontological study.

As a result of this study eight species were determined from seventeen sections of the limestone. They are as follows:

1. <i>Cribrogenerica</i> sp.	5. <i>Ozawainella angulata</i> COLANI
2. <i>Cribrospira panderi</i> MÖLLER	6. <i>Fusulinella parva</i> LEE et CHEN
3. <i>Geinitzia</i> sp.	7. <i>Fusulinella</i> sp.
4. <i>Bigennerina</i> sp.	8. <i>Eoschubertella obscura</i> LEE et CHEN

"*Staffella*" sp. should be called *Ozawainella angulata* COLANI and the faunule in question is, though not so many, richer than formerly thought. Seeing that it comprises such primitive fusulinids as *Ozawainella* and *Fusulinella* but not *Schwagerina* and other higher forms in it, and that *Ozawainella angulata* is the most common member of the faunule, I have come to the conclusion that the limestone can be safely correlated to certain limestones in the Kôten Series of Nei-etu²⁾

* Transactions of the Palaeontological Society of Japan, No. 140.

1) T. KOBAYASHI and S. KIN: Studies on the Older Rock Formations of North Heian-Dô, Chosen (Korea). Jour. of Geography, Vol. XVIII, 1931.

2) N. HATAE: Stratigraphical Division of Heian System on Fossil Foraminifera. The Jubilee Publication in the Commemoration of Prof. H. YABE's 60 th Birthday, pp. 551-562.

and Zidô¹⁾ Coal-field, Tyôsen, and to the Penhsi Series of Taitzuho district, Southern Manchoukuo²⁾ and to the Huang-lung Limestone of North China³⁾. The age of this limestone faunule may be Moscovian as those in others in Tyôsen, Manchoukuo and North China.

Genus *Ozawainella* THOMPSON

Ozawainella angulata COLANI

Figs. 1-5.

1924. *Fusulinella angulata* COLANI: Mém. Serv. Géol. Indochine, Vol. XI, fasc. I, pp. 74-75, Pl. 2, figs. 16-21.

1930. *Staffella angulata* COLANI, LEE, CHEN, and CHU: Mem. Nat. Res. Inst. Geol. China, No. IX.

Test very small and lenticular with subacutely angular periphery, nearly flat slopes and very obtuse umbilical areas. Periphaeral angle about 53 degrees. The axial length shorter than the median width, 0.86 mm. and 0.43 mm. being the respective dimensions of a full-grown shell. The number of whorls usually 4 or 5. Spirotheca relatively thin and apparently composed of only one uniform layer. Its composite nature is not observable probably because of ill-preservation. Proloculum very small, having a diameter of 0.05-0.07 mm.

Measurements:

Volution	Proloculum						Specimen
Rate of Growth	0.07	0.11	0.23	0.35	0.55	0.85	1, as
	0.05	?	?	0.35	0.61	0.86	3, as
		0.16	0.25	0.34	0.60		4, as
	0.05		0.21	0.30	0.50	0.72	5, as
	0.068	0.12	0.24	0.42	0.75		After LEE, CHEN, CHU

Remarks: The present species is represented by several axial sections and unfortunately there is no sagittal section. The present form however perfectly agrees with *Ozawainella angulata* COLANI from the Huanglung limestone described by LEE, CHEN, and CHU in all of the important observable characteristics.

Genus *Fusulinella* MÖLLER

Fusulinella parva LEE et CHEN

Figs. 6, 7.

1930. LEE, CHEN, and CHU: Mem. Nat. Res. Inst. Geol. China, No. IX.

1) H. HUZIMOTO: Some Foraminiferous Fossils from the Kôten Series of Zidô Coal-Field, Tyosen. Jour. Geol. Soc. Japan, Vol. 45, No. 533.

2) M. NODA: Stratigraphical Studies on the Carboniferous and Permian Formations of Southern Manchoukuo. Bull. Central National Museum of Manchoukuo, No. 1, pp. 7-70, pls. III-X, Sept., 1939.

3) J. S. LEE, S. CHEN, and S. CHU: Huanglung Limestone and Its Fauna. Mem. Nat. Res. Inst. Geol., No. IX, Nov., 1930.

Figs. 1-5. *Ozawainella angulata* COLANI
1-5. Axial sections $\times 53$ Nos. 3, 1, 4, 4, 5

Test small and almost sphaerical. The ratio of axial length to the width 0.48 mm. : 0.60 mm., or 1 : 1.2. Number of whorls 4. Spirotheca very thin and its thickness is 0.21 mm. in the last volution. Proloculum very small and sphaerical.

Figs. 6, 7. *Fusulinella parva* LEE et CHEN
6. Sagittal section $\times 48$ No. 2
7. Sagittal section $\times 54$ No. 17

Measurements:

Volution	Proloculum	1	2	3	4	Specimen
Rate of Growth	0.062		0.21	0.31	0.48	2, as
				0.32	0.39	17, as
		0.12	0.18	0.30	0.48	After LEE, CHEN, CHU
			0.18	0.28	0.44	

Remarks: Represented by only two sagittal sections. Because of the ill-preservation, the minute structure of the wall is not observable, but its close resemblance with *Fusulinella parva* LEE et CHEN from the Huanglung Limestone in the shape and other features can hardly be overlooked.

Fusulinella sp.

Figs. 8, 9.

Represented by only two saggital sections. Because of the ill-preservation of the specimens, most specific characters can not be determined except the rate of growth which shows its close approach to *Fusulinella bocki* MÖLLER although their specific identity is not warranted. The rate of growth is as follows:

Volution	Proloculum	1	2	3	4	5	Specimen
Rate of Growth	0.11	0.22	0.30	0.45	0.67	0.95	3, ss
			0.27	0.47	0.66	0.94	6, ss
Thickness of Wall					0.035	0.039

Figs. 8, 9. *Fusulinella* sp.8, 9. Sagittal sections $\times 35$ Nos. 3, 6.Genus *Eoschubertella* THOMPSON*Eoschubertella obscura* LEE et CHEN

Figs. 10, 11.

1930. *Schubertella obscura* LEE et CHEN: Mem. Nat. Res. Inst. Geol. China, No. 9, pp. 112, 113. Pl. VI, figs. 12-13.

Two sagittal sections of the species are contained in the collection. Test extremely minute. Number of whorls is only 3, and the first two whorls are more closely coiling than the later ones. Because of the minute size of the shell and bad state of preservation the structure of the spirotheca can not clearly be seen but it appears to be composed of a simple homogeneous layer.

Figs. 10-11. *Eoschubertella obscura* LEE et CHEN10. Sagittal section $\times 60$ No. 3a11. Sagittal section $\times 57$ No. 3b

Measurements:

Volution	Proloculum	1	2	3	Specimen
Rate of Growth	0.016	0.11	0.20	0.30	3a, ss
		0.11	0.19	0.28	3b, ss
		0.14	0.22	0.34	LEE et CHEN
		0.12	0.19	0.30	

朝鮮平安北道楚山地方の紡錘蟲化石 (摘要)

鳥 山 隆 三

昭和 6 年小林貞一博士及び金鐘遠學士が楚山郡南面新幕洞路傍北東側に於いて発見された紡錘蟲石灰岩中に別記の有孔蟲を識別し得た。この紡錘蟲化石は *Ozawainella*, *Fusulinella* の如き primitive form のみでこの事實は朝鮮の他の地方の紅店統, 南滿・北支の太子河系最下部の本溪統に見られ且つ岩質上からもこの紡錘蟲石灰岩を含む地層は紅店統に屬しその時代は Moscovian なることは明白である。