Takashi Koiwai: On the Stratigraphical Position of the Matchgar Formation

The name Marii formation was first proposed by J. MAKIYAMA in 1924 for a marine deposit developed along the sea shore of Cape Marii near the abandoned village of Matchgar in the Schmidt Peninsula in North Sakhalin. The stratigraphic sequence of the sediments in this area is stated by him to consist of a basement of effusives overlain conformably with a coal-bearing deposit. The latter is unconformably superposed with the Marii formation, a marine deposit comprising sandy shale intercalating thin sandstone layers and a total of seven fossil horizons, were distinguished in it. This fossil assemblage was called by him the Matchgar faunule. The Marii formation is unconformably covered with the Tumi formation of fine grained sandstone and shale and yielding marine shells. And with fault contact the next younger is the pilyk formation of sandstone and sandy shale with marine shells.

In 1934, J. MAKIYAMA described and illustrated the marine shells from the Marii formation and compared them with the molluscan shells from Asagai formation developed in the Joban coal-field in Fukushima Prefecture. As the result of his study, he expressed the opinion that the geological age is Oligocene rather than Miocene as once stated by TIKHONOVICH, YABE, YOKOYAMA, TOKUNAGA and WATANABE. He also expressed the opinion that the faunule is of Aquitanian age.

However, recently I. N. KUZINA and I. I. RATNOVSKII in 1956 published the results of their geological studies in the vicinity of Schmidt Peninsula. In this paper they gave particular emphasis to the stratigraphical position of the Matchgar formation. According to their studies and to the correlation table worked out by them, the stratigraphic position does not seem to be in accord with the results of J. MAKIYAMA (1924). To progress the discussions the correlation table worked out by those two authors is given in the following table.

From the correlation table and the details given in their paper it is evident that they regarded the Matchgar faunule of MAKIYAMA

or their Matchgar formation to belong to the lower Miocene and to occupy a position in the lowest part of the stratigraphical sequence and on the vicinity of Schmidt Peninsula. However J. MAKIYAMA reports on the development of volcanic rocks and coal-bearing strata unconformably below the Matchgar. Conformably superposed upon the Matchgar according to those two authors is the Tumi and this is conformably overlain with the Piliska formation and covered with the Kaskadna formation. This latter is conformably superposed with the Wengerii and overlain with the Diatom bearing formation, then with the Matituk and the Pomir. All of these strata units are said to be conformable with one another, contrary to MAKIYAMA's view.

Of the said strata units, the lowest or the Matchgar formation of KUZINA and RATNOVSKII correspond to the Marii formation of MAKIYAMA which contains seven horizons. Even though the two units are the but with different names, MAKIYAMA's name has priority and should be retained. It should be mentioned that in the lower part of the Matchgar formation there prevail coal-beds, but give no reference to the volcanics described by MAKIYAMA. In this reasoning the Marii of MAKIYAMA corresponds only to the upper part of the Matchgar, but as stated by MAKIYAMA, an unconformity separates the marine sediments from the coal-bearing deposits, and thus, an unconformity occurs in the Matchgar of those two authors.

MAKIYAMA reported that an unconformity separates his Marii from the next younger Tumi formation, both of which are marine in origin. However, the two authors already referred to claim that the sequence is a conformable one. Both KUZINA and RATNOVSKII consider that their Matchgar is a correlative of the lower part of the Kholmsk (Maoka) and the whole of the Arakai. However, their lower part of the Kholmsk is nothing but a part of the Arakai of the writer, and their Arakai comprises the volcanics which interfinger with the lower part of their Kholmsk. In other words, their lower part of the Kholmsk is nothing but a sedimentary facies of

Schema of correlation of Tertiary deposits on Sakhalin Island.

South Sakhalin Y. Sasa & T. KOIWA 1959 (Jour. Geol. Soc. Japan Vol. 65, no. 766, p. 453)		Age		South Sakhalin		South-west part of North Sakhalin		Engizpaliskii Region		Eastern coast of North Sakhalin (Dagi river)		Schmidt Peninsula		South-East of North Sakhalin			
Shiritoru (知取) Group (厚内) Maruyama (円山) F.M.		Nokoro F.M.		Pliocene		Maruyamskaja (円山)		Aleksandrovskaja		Tenginskaja Mactra beds Ebav river		Nutovo		Pomilskaja Matituk F.M.		?	
Kurashi F.M (久良志) (Horokishi F.M) 幌岸		Naihoro F.M (内幌)		Upper		Kurasiskaja (久良志) marine beds of coal bearing F.M.		Coal bearing Part		Wagis-skaja coal bearing F.M.		Nad-Ugleno (Tanjos6) marine F.M.		Diatom bearing F.M.		Khuzinsk Uranaisk	
Honto Group (本斗)		Esutoru (恵須取) (coal-bearing) Sub-Group		Middle		Neveliskaja F.M. (本斗)		Pre-coal bearing part with Cape Malkevicha (Agnevskaia) Upper Dui F.M.		Engizpaliskaja		Pre-coal bearing Part		Dagi F.M.		Piliskaja	
Akushu (握珠) Sub-group		Hacchorei F.M. (八脉嶺)		Lower		Kholmiskaja F.M. (真岡)		Khoimjo		Tumiskaja		Uininskaja		Tumskaja		Pilengi F.M.	
Arakai (荒貝) Effusives		Arakai F.M.		Eocene-Oligocene		Sandstone Lowerpart of Kholmisk F.M. Arakai F.M. (荒貝)		Sandstone of Cape Egranvis		Matchgar F.M.		Daekurinskaja		Matchigar F.M.		Mutnovskaja	
Maoka Group		Kiyokawa F.M. (清川)		Paleogene		Takaradai F.M. (宝台)		Khandasin F.M.								Ratmanovkaja Lyukaminskaja & Conglomerate F.M.	
Naibuchi Group		Hakuun F.M. (ostrrea) (白雲)		Cretaceous		Naibuchin F.M. (内淵) Conglomerate F.M.		Lower Dui F.M. Conglomerate F.M.									
Kawakami F.M. (川上) 夾炭層																	

their Arakai, which is a volcanic facies. These two facies interfinger with one another, covered with the same sediments which make up the Hacchorei formation and which is locally unconformably with them. Both of the stated sedimentary facies are underlain unconformably with Nishisakutan formation which they call the Takaradai formation.

Comparing the northern and southern parts of Sakhalin with one another based upon stratigraphical sequence, faunal sequence and the writer's experience, it may be said that the lower part of the Matchgar formation of KUZINA and RATNOVSKII corresponds to the Naibuchi formation, their upper part of the Matgar is nothing but MAKIYAMA's Mari formation and is a correlative of the Nishisakutan formation, and the Arakai volcanics which are conformably superposed upon the Nishisakutan are represented by the stratigraphical break separating the upper part of the Matchgar from the Tumi formations, and thus the supposed conformable relationship between the two formations must be rejected.

The above mentioned procedure based upon field evidence and fossil support brings about a more natural stratigraphic classification of the Paleogene to Neogene rocks developed in Sakhalin. The same stratigraphic relationships may also be observed in the Japanese Islands, for example in Hokkaido, the correlatives of the Nishisakutan and Arakai volcanics are the Poronai shale and the Momijiyama pyroclastics, respectively, while in the Joban coalfields in Fukushima and Ibaraki Prefectures, the equivalents are the Asagai sandstone and the Shirasaka shale in upward sequence, respectively. The former is typically marine and the latter although marine in origin incorporated much pyroclastic sediments due to volcanism at that time.

The molluscan fauna distributed in the Asagai, poronai and Nishisakutan formations are exceedingly similar with one another and all three formations superposed upon the coal-bearing formation and its correlatives were

influenced with volcanic sediments. It is after the deposition of the just mentioned sediments that the respective areas were uplifted to be subjected to distrophism and denudation, after which there again followed widespread submergence of the land leading to the deposition of the early Miocene deposits. The molluscan fauna between the Oligocene and Miocene deposits differ remarkably and only very few cross the boundary, and this is also good evidence for the separation of the geological ages of the remote regions. Since the fossils have already been described by J. MAKIYAMA (1934) and listed in many of the reports bearing on the geology of Sakhalin. They are here not mentioned.

Finally the writer thanks Professor Yasuo SASA of the Hokkaido University, Professor Wataru HASHIMOTO of the Tokyo Kyoiku Daigaku and Professor Kotora HATAI of the Tohoku University, for their encouragement and the Chief Roy C. KEPFERLE of M. G. B. in Tokyo, for his Kindness.

Thanks are also due to Dr. Saburo KANNO of the Tokyo Kyoiku Daigaku for his Kind information on the present Russian works.

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Jour. Geol. Japan, Vol. 67, No. 785, February, 1961