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The fossil on the cover is *Nipponitella explicata* HANZAWA, an aberrant uncoiled fusulinacean from the Lower Permian Sakamotozawa Formation, southern Kitakami, Northeast Japan.

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711. REVISION OF THE PERMIAN "STROMATOPOROIDS" REPORTED FROM JAPAN*

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Abstract. Four species of Permian "stromatoporoids" described from Japan have been reexamined based on the original specimens and their thin sections. None shows clear skeletal structures of genuine stromatoporoids owing to their poor state of preservation or to misidentification. It is concluded that one is possibly a chaetetid, two may be sponges and the fourth likely to be a brachiopod. There is no positive evidence for the occurrence of Paleozoic-type stromatoporoids in the Permian either in Japan or elsewhere. These facts suggest that they became extinct prior to the Permian.

Introduction

Two distinct groups of stromatoporoids are known in the geologic record: the Paleozoic-type, and the Mesozoic-type, the latter having also been called sphaeractinoids. The former occurs commonly in Ordovician, Silurian and Devonian carbonate rocks. They have a world-wide distribution, being important as reef builders, especially in the latter two periods. It is known that stromatoporoids appeared in the Middle Ordovician, reached their acme in the Middle Devonian and then most of them became extinct at the end of the Devonian. Some rare forms have been reported in the Carboniferous and Permian Periods. However, there has been controversy as to whether species described from the Upper Carboniferous and Permian are genuine stromatoporoids, and real stratigraphic range of the Paleozoic-type stromatoporoids has remained uncertain. Among these, Permian forms have been especially questioned (see FLÜGEL and FLÜGEL-KAHLER 1968). The following five Permian species have been described as Paleozoic-type stromatoporoids:

Megastroma lecomptei MONTANARO GALLITELLI
Clathrodictyon somaense YABE and SUGIYAMA
Lophiostroma ozawai YABE and SUGIYAMA
Amphipora cfr. *asiatica* REED
Stromatopora (*Parallelopora*) *minoensis* YABE and SUGIYAMA

Except for *Megastroma lecomptei* from Italy, all are from the Japanese Permian. The genera to which these species have been allocated are well known among Silurian and Devonian stromatoporoids. Type specimens of the Japanese species are stored in the Institute of Geology

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and Paleontology, Tohoku University, Sendai. The purpose of the present paper is to revise these four species using the original specimens and their thin sections, and to clarify the stratigraphic occurrence of Paleozoic-type stromatoporoids.

Acknowledgements

The author wishes to thank Professor Jack A. GRANT-MACKIE, Department of Geology, Auckland University, for reading the manuscript. He is indebted to Professor Juichi YANAGIDA, Department of Geology, Kyushu University and Dr. Jun-ichi TAZAWA, Institute of Geology and Paleontology, Tohoku University for their comments. Thanks are also due to Mr. Kimiji KUMAGAI for his photographic work, Mr. Akio ISHIKAWA and Mr. Masaaki SHISHIDO for making thin sections.

Revision of the species

1. "*Clathrodictyon somaense* YABE and SUGIYAMA"

Pl. 29, Fig. 1

Clathrodictyon somaense sp. nov., YABE and SUGIYAMA, 1933, p. 22, text-fig. 3.

This species was proposed by YABE and SUGIYAMA (1933) from the Permian of Abukuma Mountains, Japan. The fossil locality is 2.5 km west of Zusahara, Kamimano-mura, Soma-gun, Iwaki province (i. e. 2.5 km west of Jisabara, Kashima-cho, Soma-gun, Fukushima Prefecture). YABE and SUGIYAMA reported that the specimen was obtained from a large limestone boulder, probably derived from the upper part of the Permian Oashi Formation. The original description was based on a very small fragmental specimen, completely embedded in the limestone. Examination of the thin section of the holotype (monotypic, IGPS coll. cat. no. 34479) indicates:

a. Two small fragments appear in the same thin section. They are separated from each other, and were considered by YABE and SUGIYAMA as vertical and tangential structures of the same stromatoporoid. However, there is no evidence that the two specimens originate from a single skeleton.

b. In the figure shown in the text-fig. 3-B by YABE and SUGIYAMA (*op. cit.*, p. 22) many dark dots which look like cut ends of vertical pillars of stromatoporoids are recognized. However, the picture was retouched. The original specimen is in a very poor state of preservation and no pillar-like structures are preserved. Thus it is difficult to refer the specimen to a stromatoporoid.

c. The figure of the text-fig. 3-A (*op. cit.*, p. 22) was also retouched. The structures described as laminae by YABE and SUGIYAMA are not like genuine laminae as found in the genus *Clathrodictyon*. It is probable that vertical structures of a chaetetid have been misinterpreted as laminae of stromatoporoids.

Unfortunately there is no similarity between "*Clathrodictyon somaense*" and *C. vesiculosum* NICHOLSON and MURIE as claimed by YABE and SUGIYAMA. In conclusion, *C. somaense* is not considered to be a valid stromatoporoid species.

2. "*Lophiostroma ozawai* YABE and SUGIYAMA"

Pl. 29, Figs. 2, 3

Lophiostroma ozawai sp. nov., YABE and SUGIYAMA, 1931, p. 18, pl. 3, figs. 1-4.

This species was proposed by YABE and SUGIYAMA (1931) from the Permian of Omine-mura, Mine-gun, Nagato province (i. e. Akiyoshi Limestone Group? at Mine-shi, Yamaguchi Prefecture). As in the case of *"Clathrodictyon somaense"*, the description of the species was based on a very small fragmental specimen. Examination of thin sections of the holotype (monotypic, IGPS coll. cat. no. 38751) and the figures published by YABE and SUGIYAMA (1931, pl. 3, figs. 1-4) indicate that the specimen does not belong to a stromatoporoid but to a brachiopod (see also FLÜGEL and FLÜGEL-KAHLER, 1968, p. 299). The structure interpreted as vertical columns of *Lophiostroma* by YABE and SUGIYAMA are well assigned to taleolae, and laminated "horizontal" structures are of shell layer of the brachiopod. The dark dots of the tangential section (pl. 1, fig. 3) can be easily distinguished from the cut ends of papillae of *Lophiostroma* by the absence of concentric structures. They are considered to be pseudopunctae of the brachiopod. Although YABE and SUGIYAMA claimed close resemblance between *"Lophiostroma ozawai"* and *L. schmidti* (NICHOLSON), a well known Silurian species, their internal structures are entirely different. It is highly probable that the specimen belongs to a strophomenid brachiopod.

3. *"Amphipora* cfr. *asiatica* REED"

Pl. 29, Figs. 4, 5

Amphipora cfr. *asiatica* COWPER REED: YABE and SUGIYAMA, 1933, p. 21, text-figs. 1, 2.

Amphipora asiatica was originally described by Reed from the Upper Carboniferous of Yunnan, China. The specimen described as *A.* cfr. *asiatica* (IGPS coll. cat. no. 43480) came from the same limestone boulder as the one in which *"Clathrodictyon somaense"* occurred. As in the case of *"C. somaense"*, YABE and SUGIYAMA described the skeletal structures of the species, observed only in a single thin section. Examination of the thin section indicates:

a. The figures shown by YABE and SUGIYAMA were retouched and modified. The thin section suggests that the skeletal parts are much denser than those of *A. asiatica*, although the specimen is in a poor state of preservation.

b. It is not clear whether the "vertical section" of YABE and SUGIYAMA shows a real vertical skeletal structure, because the width of the skeleton (Fig. 4) is much less than the diameter shown in Fig. 5, and an axial canal is not represented.

c. There is no positive evidence that the specimen has a ramose, dendritic or cylindrical shape. The tangential section (Fig. 5) seems to be a part of a fragment, and not to have been circular in original shape.

As mentioned above, the state of preservation is not good enough to refer the specimen to a genuine stromatoporoid. It may be assigned to a sponge as noted by FLÜGEL and FLÜGEL-KAHLER (1968, p. 33).

4. *"Stromatopora (Parallelopora) minoensis* YABE and SUGIYAMA"

Pl. 29, Figs. 6, 7

Stromatopora (Parallelopora) minoensis sp. nov., YABE and SUGIYAMA, 1930, p. 20, pl. 7, figs. 1-5.

The present species was reported from the Lower Permian limestone at Kinshozan, Akasaka, Gifu Prefecture, Japan. Thin sections were newly made from the holotype specimen (monotypic, IGPS coll. cat. no. 37948), because the original thin sections were lost. Gross skeletal structures of the present specimen show no similarity to those of *Stromatopora* or *Parallelopora.* Discontinuous vertical structures and the absence of horizontal structures as shown in Figs. 6, 7 are not characteristics of these genera. YABE and SUGIYAMA discussed the microstructure of the present specimen and compared it with that of *Parallelopora ostiolata* BARGATZKY and *P. goldfussi* BARGATZKY, both from the Devonian of Eifel. But the microstructure of the Japanese specimen is obliterated. It may be referred to a sponge, although the presence of pseudomorphs of spicules noted by FLÜGEL and FLÜGEL-KAHLER (1968, p. 268) was not confirmed in the newly made thin sections.

Discussion and conclusion

The present reexamination of the type specimens indicates that there is no clear evidence for the presence of genuine Paleozoic-type stromatoporoids in the Japanese Permian. Furthermore, the affinity of *Megastroma lecomptei* with the stromatoporoids is open to question. Judging from the figures published by MONTANARO GALLITELLI (1954, pl. 8, figs. 2–5; pl. 9, figs. 1, 1a and pl. 10) its skeletal structures are different from those of true stromatoporoids. MONTANARO GALLITELLI mentioned similarity between *Megastroma* and *Stachyodes,* but the microstructures shown in her pl. 10, figs. 3–5 are considered not comparable with those of stromatoporoids. It is here concluded that Paleozoic-type stromatoporoids were extinct prior to the Permian. This is also supported by the fact that except for the five taxa discussed above, no other Paleozoic-type stromatoporoids have so far been reported from Permian sediments of the world.

Besides the Paleozoic-type stromatoporoids, such genera as *Disjectopora, Carterina* and *Irregulatopora* have been described as stromatoporoids from the Permian of the Salt Range, Pakistan by WAAGEN and WENTZEL (1887). LECOMPTE (1956) placed those genera in the Family Disjectoporidae, Order Stromatoporoidea. However, gross structures of these genera can distinguish them from Paleozoic-type stromatoporoids. Related forms have been reported also from the Permian of some other districts (see FLÜGEL, 1975). Further work should be done to confirm as to whether these Permian forms can be considered ancestors of the Mesozoic sphaeractinoids, because their microstructure is poorly known and their geographic distribution is very limited. They may, however, hold the key to

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Explanation of Plate 29

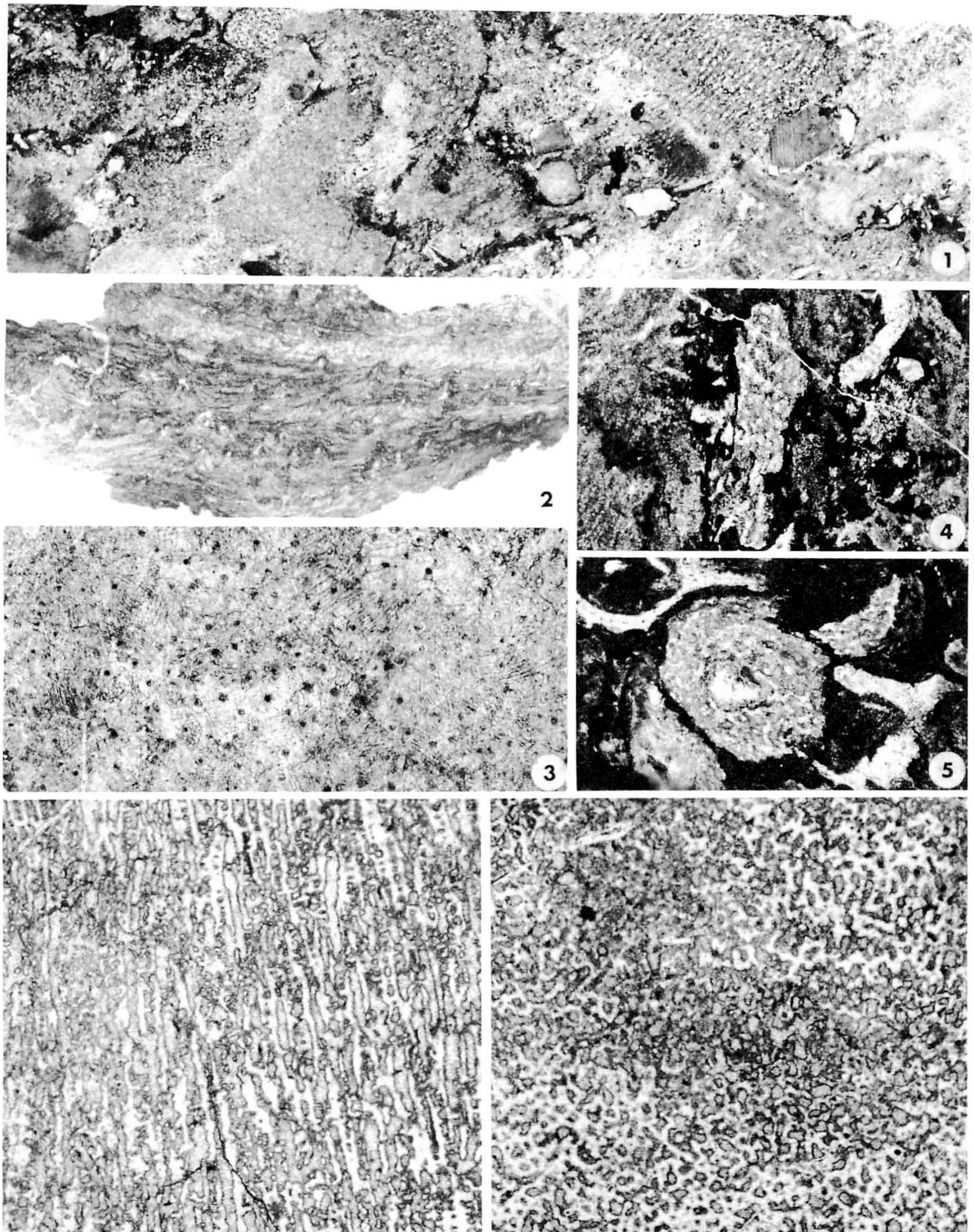
Magnification ×10

Fig. 1. "*Clathrodictyon somaense* YABE and SUGIYAMA"
IGPS coll. cat. no. 34479. It is here regarded as a *nomen dubium* (probably a Chaetetid).

Figs. 2, 3. "*Lophiostroma ozawai* YABE and SUGIYAMA"
IGPS coll. cat. no. 38751. It is here regarded as a *nomen dubium* (probably a strophomenid brachiopod).

Figs. 4, 5. "*Amphipora* cfr. *asiatica* REED"
IGPS coll. cat. no. 43480. It is here regarded as a *nomen dubium* (probably a sponge).

Figs. 6, 7. "*Stromatopora* (*Parallelopora*) *minoensis* YABE and SUGIYAMA"
IGPS coll. cat. no. 37948. It is here regarded as a *nomen dubium* (probably a sponge).



trace the phylogenetic relationship between Paleozoic-type and Mesozoic-type stromatoporoids (or the sphaeractinoid group).

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Akasaka 赤坂, Akiyoshi 秋吉, Jisabara 槢原, Kashima-cho 鹿島町, Mine 美祢, Oashi 大芦

本邦産二畳紀"層孔虫"の再検討：層孔虫類は古生代型と中生代型とに大別される。前者はオルドビス紀中期に出現し，シルル紀・デボン紀に造礁生物として繁栄したが，その地史的分布について，特に分布の上限に問題がのこされてきた。従来世界の二畳系から，古生代型層孔虫として5属5種報告されているが，その中4属4種が本邦産である。今回その模式標本を再検討した結果，保存不良又は同定の誤りにより，いずれも真の層孔虫とはみなしえないことが明らかとなった。残りのイタリー産のものも MONTANARO GALLITELLI (1954) が指摘したような *Stachyodes* との類似性はみられない。一方 WAAGEN and WENTZEL (1887) が Salt Range の二畳系から層孔虫として報告した *Disjectopora* 他のグループはいわゆる古生代型とは異なる骨格構造をもっている。これが中生代型（又は sphaeractinoids）とどういう関係にあるかは今後の問題である。以上のデータ以外に，二畳系から真の古生代型とみなしうる層孔虫の報告例がない事もあわせ考えると，古生代型層孔虫は少なくとも二畳紀以前に絶滅したものと推定される。 森　啓

Trans. Proc. Palaeont. Soc. Japan, N. S., No. 117, p. 242, April 30, 1980

SHORT NOTES

17. *EPONIDES SHIRAII*, NEW NAME FOR *EPONIDES ASANOI* SHIRAI, 1960 (PREOCCUPIED)

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During the course of a study of foraminifera from the northeastern part of Japan, it was discovered that *Eponides asanoi* SHIRAI (1960, p. 540, pl. 2, fig. 1a-c) from the Pliocene Setana Formation of Hokkaido, Japan is preoccupied by *Eponides asanoi* YOSHIDA (1958, p. 257, pl. 2, fig. 4a-c) from the Paleocene Kiritappu Formation of Hokkaido.

Since no action has been taken by Dr. T. SHIRAI who was informed about the homonymy of his species, a new name is herein proposed in order to promote stability of nomenclature. The new name *Eponides shiraii* is proposed for *Eponides asanoi* SHIRAI.

Received Oct. 26, 1979.

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712. RELATIVE FALL OF SEA LEVEL WITHIN THE PAST 3000 YEARS

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Abstract. Radiocarbon dating of two crustose coralline algae (*Porolithon onkodes*) and six hermatypic corals (species of *Porites*, *Acropora* and *Goniastrea*) from a windward fringing reef complex off Kabira Bay, Ishigaki-jima (Southwest Ryukyus) reveals that the present-day reef crest exposing 60 cm above the mean level of low tide does not represent a growing algal ridge system, but relics of a salient ridge grown between 1500 and 3000 years ago, when sea level stood at least 1.5 m higher than the present. A later fall of the sea level has planed off the top of the ridge down to the present configuration where the erosion predominates over upward "sedimentation".

The classic concept of Postglacial hydro and glacio-isostatic readjustment of lithosphere (DALY, 1934) has been vitalized to reconcile discrepancies among the curves of relative sea level change during the Holocene, which have been documented from various areas in the world (*e.g.* WALCOTT, 1972). In order to refine a numerically predicted curve modeled after this concept (CLARK *et al.*, 1978), however, we are still short of field studies controlled through time both in local and regional extent. Surficial geology of contemporary coral reef can provide information pertinent to this purpose, especially when supported by radiocarbon dating (*e.g.* TRACEY and LADD, 1974; BUDDEMEIER *et al.*, 1975).

In the fringing and barrier reefs of the Ryukyu Islands, the windward reef crest exposing above the mean low water level is ubiquitously characterized by the lack of algal ridge system and is actually barren of the present-day reef-building organisms including crustose coralline algae. As a typical example of this situation, we selected the windward fringing reef complex (24°27′N; 124°09′E) off Kabira Bay, northwestern Ishigaki-jima, Southwest Ryukyus, where a topographic zonation from forereef slope to coastal beach, *via* low tide bench, reef crest and moat, has been recognized (Fig. 1). Severe neotectonic uplift related to the plate convergence has not been deduced here from our studies of raised coral reefs (KONISHI *et al.*, 1974).

Our dated materials came from the following four environments (Table 1; Fig. 1).

(1) Reef crest exposing 60cm above low tide level consists of coral-algal reefrock composed of dead colonies of huge thick-stalked tabular *Acropora* (*A.* cfr. *humilis*) and crust (one 5 cm and the other more than 20 cm in thickness) of *Porolithon onkodes* with subordinate massive *Goniastrea*, while the forereef slope and low

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Table 1. Radiocarbon dates of corals and coralline algae from windward fringing reef, off Kabira Bay, north-northwestern Ishigaki

Sample No.	Taxa	Elevation above mean sea level	^{14}C age ($T_{1/2}$; 5568y.)
Corals:		m	
N-3248(KM-02)	*Acropora* sp. cfr. *humilis*	0 (reef crest)	2980+80
N-3247(KM-01)	*Acropora* sp. cfr. *humilis*	−0.1 (reef crest)	2350±80
N-3249(KM-03)	*Goniastrea* sp.	−0.2 (reef crest)	1980±75
Gak-5859(KK74111904)	*Porites* sp.	1.5 (abandonned bench)	3030±95
Gak-5960(KK74112102)	*Goniastrea* sp.	1.0 (emerged beachrock)	1440±90
Gak-5858(KK74111506)	*Porites* sp.	0 (dead microatoll)	1060±90
Coralline Algae:			
N-3251(KM-05)	*Porolithon onkodes*	−0.2 (reef crest)	2270±75
N-3250(KM-04)	*Porolithon onkodes*	−0.2 (reef crest)	1600±85

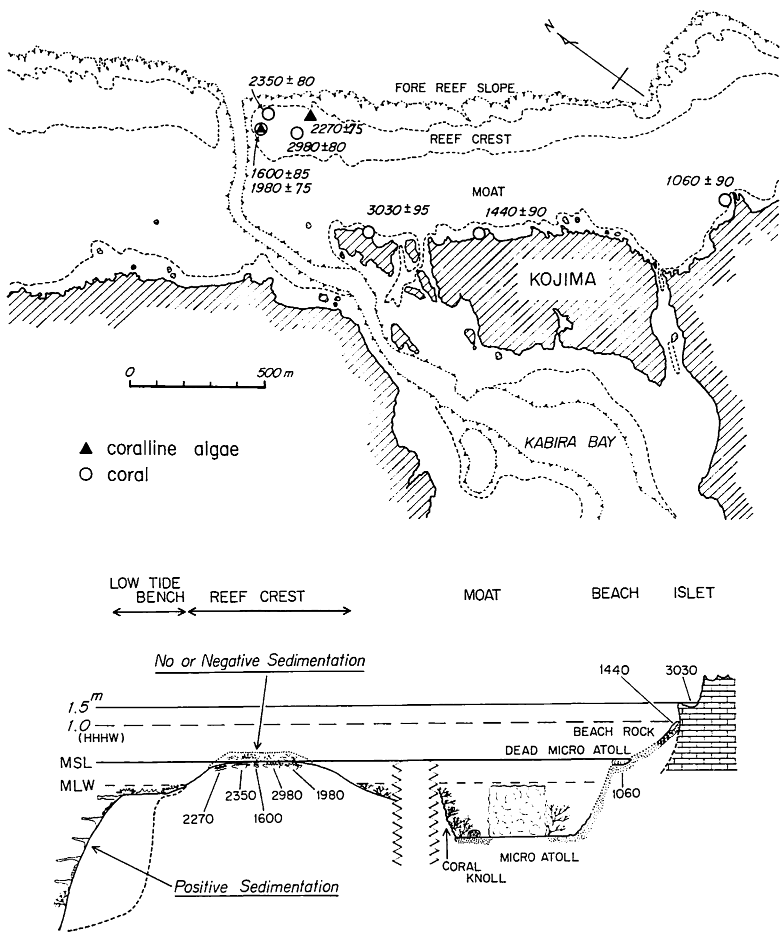

Fig. 1. Map and schematized cross-section across windward fringing reef off Kabira Bay, north-northwestern Ishigaki. Localities and radiocarbon ages of dated fossils are indicated.

tide bench are the site of vigorous growth of tabular species of *Acropora*. A veneer of living crustose corallines starts to occur only from the upper forereef slope below the low tide bench. Radiocarbon ages were determined for three corals and two algae from the reef crest, which were recovered in a shallow excavation (20 cm in depth).

(2) Back-reef moat, 2 to 3 m deep, holds microatolls of *Porites* both living and dead. The outermost layer of a dead microatoll about 1.0 m in diameter has been collected for radiocarbon dating from a very shallow landward part of the moat off Yoshihara. In contrast to the living colonies, it exposes above the mean low water.

(3) At the northeastern beach of Kojima, emergent beachrocks crop out 1.0 m above the present mean high water level. A small authochthonous colony of *Porites* attached to the top of the beachrock was collected for dating.

(4) A thick, but partly eroded, colony of *Goniastrea* was sampled from a dried tide pool on an abandonned abrasion bench cutting the Pleistocene Riukiu Limestone, 1.5 m above the present mean sea level.

Our radiocarbon dates indicate that the sea level here (1) attained the present position by 4000 y. B. P. or even earlier, (2) stood at least 1.5 m higher than the present during the period between 1500 and 3000 y. B. P., and (3) subsequently fell to the present, resulting in diminishing a ridge covered with algal crust into the non-accreting reef crest, within the past 1000 years. Abandonned bench of several tens cm above the highest high water spring which occurs sporadically at pocket beach may record the same event of the sea level drop. A similar magnitude of relative fall of sea level for the last 2000 years was lately documented at the Senkaku Islands about 150 km northwest of Ishigaki across Okinawa (=Ryukyu) Trough (KONISHI *et al.*, 1979).

A study of growth rate and succession of crustose coralline algae on artificial substrate (glass and polyvinyl chloride plates) confirmed that practically not a single thallus of the coralline algae has settled on the top of the reef crest during one year experiment (MATSUDA, 1979). Together with this conclusion, field observation about activities of reef-building organisms suggest that the reef crest represents an unstable substrate, where erosion accompanied with urchin boring (*Echinometra mathaen* (BLAINVILLE)) prevails to accretional sedimentation at present. Like other parts of the Ryukyu Islands, the sea level maximum referred to the "Climatic Optimum" of 5000 to 6000 y. B. P. could not be verified here. Much deeper structure of this windward fringing reef off Kabira should be thoroughly examined, with the aid of subsurface coring, in order to trace back the history of sea level changes prior to 3000 y. B. P.

The present work is an outgrowth of the interdisciplinary research project financed by the Grant-in-Aid for Scientific Research (No. 910313) from the Ministry of Education, Science and Culture. We thank Prof. M. HORIKOSHI, the project representative. Radiocarbon dates were supplied from Dr. K. KIGOSHI (Gakushuin University) and Mr. T. HAMADA (Japan Radioisotope Association).

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過去3000年間の相対的海水準降下：

琉球列島石垣島の川平湾外にある風上側裾礁には平均低潮位よりも約 60 cm 高く造礁サンゴ，サンゴモの生育していない平坦礁頂 (reef crest) がみられる。この裾礁複合体から採取されたサンゴモ (*Porolithon onkodes*) 2試料，造礁性サンゴ6試料 (*Acropora, Goniastrea, Porites* 属) の放射炭素年令は，この平坦礁頂が石灰藻嶺系ではなく 1500～3000 年前の礁突出部の残存地形であり，当時は現在よりも少なくとも 1.5 m 海水準が高かったことを示している。その後の相対的海水準降下によりその突出部は侵食をうけ現在の地形にまで平坦化された。

小西健二・松田伸也

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713. URANIUM-SERIES AGE OF THE HIRADOKO AND UJI SHELL BEDS, NOTO PENINSULA, CENTRAL JAPAN*

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Abstract. Th^{230}/U^{234} dating of ahermatypic coral shows that both the Hiradoko and Uji Shell Beds of the Noto Peninsula were formed at the same age, approximately 120,000 years ago. Some discriminations in faunal composition between these two shell beds are likely to have been caused by the difference in bathymetric control due to the submarine topography. The marine Hiradoko Terrace including these shell beds is correlative with the Shimosueyoshi Terrace in the southern Kanto area, which is traceable with the shoreline features in many parts of the world, formed during a late Pleistocene eustatic high sea stand. The elevation of the former shoreline for marine terraces around the Noto Peninsula, which are correlated with the Hiradoko Terrace, indicates an average rate of uplift varying from 1.2 m per 1,000 years in the northern end of the peninsula to 0.4 m per 1,000 years in the south during the last 120,000 years.

Introduction

Th^{230}/U^{234} ages averaging 120,000± 6,000 years old have been determined for solitary corals from the Hiradoko and Uji Shell Beds in the northern part of Suzu City, Ishikawa Prefecture. These are the first uranium-series dates available from marine terraces of Honshu, Japan, which now allow us to relate these beds to various Pleistocene events in other areas. Preliminary results of oxygen isotope ratio (O^{18}/O^{16}) analysis are also presented for some molluscan shells from these shell beds.

Late Pleistocene marine terraces are almost continuously distributed around the Noto Peninsula except the rocky coast in the northern part. In spite of extensive paleontologic, geomorphologic and structural studies of these terrace deposits, their chronologic assignment have remained uncertain, because either radiometric dates or such a time-indicative marker as tephra were not available.

The Hiradoko Shell Bed named by MOCHIZUKI (1932) who also described a molluscan fauna near Hiradoko, was formerly thought to be either a late Pleistocene or nearly Holocene age (*e.g.* ASANO, 1938). The Hokuriku Quaternary Research Group (abbreviated HQRG, hereafter; 1961) found another shell bed called the Uji Shell Bed, at a locality only 4 km east of the outcrop of the Hiradoko Shell Bed. From morphostratigraphic and paleontologic reasons, HQRG (1961) has suggested a probable correlation of the Hiradoko Shell Bed with the Shimosueyoshi Terrace deposit in the southern Kanto area. The Hiradoko Shell Bed was then stratigraphically

* Received September 7, 1979; read June 9, 1979 at Tatsunokuchi, Ishikawa Prefecture.

divided into two members, Upper and Lower. The Uji Shell Bed was separated from these members as having been deposited during a later transgression corresponding to another eustatic high stand of sea level ("Musashino transgression" in South Kanto) which occurred subsequent to the Shimosueyoshi transgression. UJIIE (1975) once argued a possibility that the Hiradoko Shell Bed is of Postglacial age based on its foraminiferal assemblage. However, these paleontologic and morphostratigraphic datings are less reliable than radiometric dates to identify and correlate subdivisions of the late Pleistocene, because faunal changes have been negligible during this short period of time and because of local variations in the rate of vertical displacement. The Hiradoko and Uji Shell Beds have been dated by the C^{14} method as being >30,000 and 21,200±1,200 years B. P., respectively (FUJII, 1969). Such recent works as KASENO and HIRAYAMA (1976), FUJII (1976), MATSUURA (1977) and OTA and HIRAKAWA (1979) reviewed these previous views of age assignment and suggested that both of these shell beds may be formed during the same transgression phase.

Materials and Locations

Analyses were made on five samples consisting of two species of ahermatypic solitary corals, *Cylindrophyllia minima* YABE et EGUCHI and *Heterocyathus japonicus* (VERRILL), from localities 18 and 24 of MORI (1976, ms) as shown in Fig. 1. The following locality descriptions refer to a 1 to 25,000 scale sheet (1970 edition) "Noto-Iida" of the Geographical Survey of Japan.

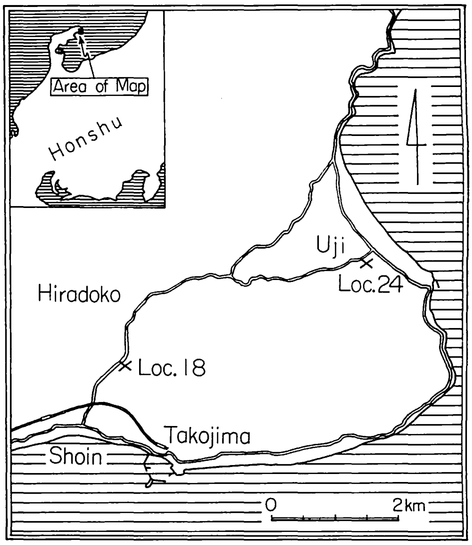

Fig. 1. Index map showing the localities where the analyzed coralline samples were collected. Locality number refers to those of MORI (1976, ms).

Loc. 18

Hiradoko Terrace of HQRG (1961). Longitude 137°18′16″E, latitude 37°27′04″N, 30 m above the present sea level, at a quarry about 750 m south of Hiradoko, Suzu City.

Loc. 24

Uji Terrace of HQRG (1961). Longitude 137°20′51″E, latitude 37°27′51″N, 13 to 15 m above the present sea level, at an outcrop about 100 m west of the Honryuji Temple, Uji, Suzu City.

Methods and Results

The Th^{230}/U^{234} method of dating marine carbonate materials has been discussed by many workers (*e.g.* BROECKER, 1963; THURBER *et al.*, 1965; SAKANOUE *et al.*, 1967). The procedure for separating and purifying thorium and uranium isotopes is essentially the same as that was described by OMURA (1976). The overall chemical yield was checked by U^{232} and

Table 1. Isotopic composition and estimated ages calculated from Th^{230}/U^{234} ratios of solitary corals from Hiradoko and Uji Formations.

Stratigraphic Unit*	Material	Isotope Concentration				Activity Ratio			Estimated Th^{230} Age ($\times 10^3$yr)
		U^{238} (ppm)	U^{234} (dpm/g)	Th^{232} (ppm)	Th^{230} (dpm/g)	U^{234}/U^{238}	Th^{230}/Th^{232}	Th^{230}/U^{234}	
Hiradoko Formation	C. m.**	4.07 ±0.12	3.30 ±0.10	0.151 ±0.021	2.16 ±0.07	1.09 ±0.02	59.6 ±8.0	0.655 ±0.029	115^{+10}_{-8}
		3.83 ±0.08	3.06 ±0.06	0.116 ±0.022	2.04 ±0.07	1.07 ±0.02	72.9 ±13.6	0.667 ±0.026	119^{+9}_{-8}
		4.02 ±0.11	3.26 ±0.09	0.136 ±0.020	2.23 ±0.07	1.09 ±0.02	68.3 ±9.7	0.684 ±0.025	125^{+9}_{-8}
Uji Formation		3.83 ±0.10	3.18 ±0.08	0.105 ±0.016	2.13 ±0.05	1.11 ±0.02	84.3 ±12.6	0.670 ±0.025	120^{+9}_{-8}
	H. j.***	3.27 ±0.08	2.76 ±0.07	0.141 ±0.021	1.85 ±0.05	1.13 ±0.03	54.5 ±8.3	0.670 ±0.025	120^{+9}_{-8}

* according to the Hokuriku Quaternary Research Group (1961)
** *Cylindrophyllia minima* YABE et EGUCHI
*** *Heterocyathus japonicus* (VERRILL)

Th^{228} used as the yield tracers. Alpha-particle spectrometry was employed, using a multi-channel pulse height analyzer with silicon solid-state detectors.

Analyses of X-ray diffraction patterns prove that all the coral specimens have retained their original mineralogical composition as indicated by their aragonitic nature.

Results of these analyses are summarized in Table 1. The standard errors attached are derived from counting statistics (σ_1). Th^{230} ages are calculated on the assumption that samples were initially free of Th^{230} and that all the measured Th^{230} have originated only postmortemly from the disintegration of its parent U^{234}.

Discussions

The following evidences suggest that all of the estimated Th^{230} ages in Table 1 are reliable. First, the specimens are entirely free of recrystallization, as shown by the absence of calcite. Second, the Th^{230}/Th^{232} ratios are high compared with values of 1 to 2 which are commonly found in natural waters (KAUFMAN and BROECKER, 1963; THURBER *et al.*, 1965; VALLENTINE and VEEH, 1969; OMURA, 1976). A measurable but small amount of Th^{232} may have resulted from terrigenous materials which could not be removed from the cavity of corallites. Even if Th^{230} was contaminated altogether with Th^{232}, most of Th^{230} have already decayed out by the present. Hence, the influence of contaminant Th^{230} upon the Th^{230}/U^{234} ratios from which ages are calculated must be very small. Finally, the average U^{234}/U^{238} ratio of 1.10±0.01 is consistent with Th^{230} age of 120,000 years, considering the ratio at which U^{234}/U^{238} changes from 1.14 (KU *et al.*, 1977) to its secular equilibrium value of 1.00.

It is estimated from the Th^{230}/U^{234} ratios that the Hiradoko Shell Bed was formed 120,000±8,000 years ago and the

Uji Shell Bed, 120,000±9,000 years ago (Table 1). It may, therefore, be concluded that both shell beds were formed at the same time, approximately 120,000 years ago. These ages suggest that the Hiradoko Terrace including these shell beds is certainly correlative with the Shimosueyoshi Terrace in the southern Kanto area, because the latter has been dated to be 120,000 to 130,000 years old by the fission track method (MACHIDA and SUZUKI, 1971). The C^{14} dates, particularly of 21,200±1,200 years for the Uji Shell Bed, reported by FUJII (1969), are less reliable than Th^{230} dates shown in Table 1, because a small amount (only a few percent in weight) of contamination of modern carbonate can make an apparent C^{14} age in the range of 20,000 to 30,000 years old.

A preliminary analysis of oxygen isotope ratio (δO^{18}) was also carried out on some molluscan shells which were conspicuously occurred as a common species in both shell beds. As shown in Table 2, δO^{18} values obtained from samples of the Hiradoko Shell Bed are 0.3 per mil for aragonitic and 0.5 per mil for calcitic shells lower than those of the Uji Shell Bed. It may be estimated that the Hiradoko Shell Bed was formed in a water temprature of approximately 1 to 2°C higher than that of the Uji Shell Bed using the equation of HORIBE and OBA (1972) and also assuming that the differences in δO^{18} value are due to the water temperature of the environment where each shell bed was formed. Therefore, it may safely be assumed that the Hiradoko Shell Bed was formed on a shallower sea bottom than the Uji Shell Bed during the same high sea stand. Although the nature of substrata also should be one of the important factors controlling the molluscan assemblage as pointed out by MATSUURA (1977), some differences in faunal composition of these two shell beds, which were emphasized by HQRG (1961), appear to have been caused essentially by the difference in their inhabiting depth reflecting the submarine topography at that time.

Shoreline features standing at 2 to 10 m above the present sea level have been found in many places of the world, and they are thought to represent a eustatic high sea stand that occurred approximately at 120,000 years B. P. (*e. g.* OSMOND

Table 2. δO^{18} values of some molluscan shells from Hiradoko and Uji Shell Beds. Parenthesized figures mean number of specimens analyzed.

Shell Bed	Material	δO^{18}_{SMOW}
Hiradoko	Aragonite *Callista chinensis* (13) *Strombus japonicus* (5)	−1.02±0.22
	Calcite *Pecten albicans* (6)	−0.22±0.20
Uji	Aragonite *Callista chinensis* (11)	−0.72±0.31
	Calcite *Pecten albicans* (6)	+0.26±0.24

et al., 1965; VEEH, 1966; BROECKER *et al.*, 1968; KONISHI *et al.*, 1974; KU *et al.*, 1974). The marine terraces correlated with this high stand age are traced almost continuously around the Noto Peninsula. The former shorelines for the terraces correlative with the Hiradoko Terrace are, however, not within the 2 to 10 m range of elevations because of the tectonically active nature of this area. For example, OTA (1975) concluded that the height of the former shoreline for the Hiradoko Terrace varies from 110 m at the northern end of the peninsula to 20 m in the south and that the peninsula could be divided into eight blocks, each of which seemed to tilt south or southeastwards on the basis of the height distribution of the former shorelines. The elevation of the former shoreline for the Hiradoko Terrace is close to 70 m above the present sea level near Hiradoko, Suzu City (OTA and HIRAKAWA, 1979). The Hiradoko Upper Shell Bed may, therefore, be interpreted as having been deposited in waters of about 40 m deep. This estimation is consistent with the bathymetric range inferred by the molluscan faunal analysis of MATSUURA (1977). Assuming that the Hiradoko Terrace was formed 120,000 years ago, when sea level stood eustatically 2 to 10 m in higher than the present, there appears to have occurred a tectonic uplift on the order of between 60 and 68 m in this segment of the coast during the past 120,000 years, or as approximate average uplift rate of 0.5 to 0.6 m per 1,000 years. These rates of uplift can be estimated also for other parts of the Noto Peninsula where the Hiradoko Terrace is preserved. A maximum rate of the uplift is 1.2 m per 1,000 years in the northern end and a minimum, 0.4 m per 1,000 years in the south of the peninsula.

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能登半島平床および宇治貝層の放射年代： 能登半島珠洲市北方の平床 および 宇治貝層から単体サンゴ (*Cylindrophyllia minima* と *Heterocyathus japonicus*) を見出し，Th^{230} 成長法によって，それらの放射年代を求めた。その結果，両貝層が 同一高海水準期（約 120,000 年前）の産物であり，両貝層を含む平床段丘は関東地方の下末吉段丘と対比されることが明らかになった。なお，従来より指摘されてきた両貝層間の軟体動物動物群の差は，同一海水準における深度差によると考えられる。このことは，両貝層間の共通種として多産する *Callista chinensis* および *Pecten albicans* 殻の予察的な δO^{18} 値の測定結果からも支持される。また平床段丘面の旧汀線高度から，平床付近で垂直方向の地殻変動率が 0.5-0.6 m/1,000 yr であり，能登半島全域を通してみた場合，その最大が北端付近の約 1.2 m/1,000 yr，最小が南部の 0.4 m/1,000 yr であることが推定される。 大村明雄

Trans. Proc. Palaeont. Soc. Japan, N.S., No. 117, p. 254, April 30, 1980

SHORT NOTES

18. A NOMENCLATURAL NOTE ON *NEOPROETUS* (*PARAPROETUS*)

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and

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A new subgeneric name, *Neoproetus* (*Siciliproetus*) is proposed for *Neoproetus* (*Paraproetus*) KOBAYASHI and HAMADA, 1979 which was founded on *Phillipsia sicula* GEMMELLARO, 1892 (Permian trilobite, Sicily), as its type-species, because it is preoccupied by *Paraproetus* PŘIBYL, 1964 (type-species: *Proetus girvanensis* NICHOLSON and ETHERIDGE, 1879, Ordovician trilobite, Scotland). The authors cordially thanks to Dr. C. BRAUCKMANN for calling them attention to the homonymy.

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Trans. Proc. Palaeont. Soc. Japan, N. S., No. 117, pp. 255-263, pl. 30, April 30, 1980

714. A NEW *CHLAMYS* FROM THE SHITAKARA FORMATION OF THE URAHORO GROUP, KUSHIRO COAL FIELD, EASTERN HOKKAIDO*

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Abstract. The Shitakara Formation of the Urahoro Group in the Kushiro coal field, eastern Hokkaido, is mainly composed of gray fine-grained sandstone, pebbly to granular conglomerate, and dark gray sandy siltstone, and yields abundant and characteristic molluscan fossils which are shallow sea or brackish water dwellers and called the upper Ishikarian fauna (MIZUNO, 1964). The writer describes a new species of *Chlamys* based on several tens specimens collected from a pebbly to granular conglomerate or fine-grained sandstone bearing pebbles and granules at 27 localities in the Tokomuro, Ombetsu and Kamicharo districts, western and central parts of the coal field. The new species is compared with the other species of *Chlamys* described from Oligocene or Oligo-Miocene formations of Japan and Sakhalin, USSR. It is considered to include several undescribed species of *Chlamys* which have been reported under some invalid specific names from the Shitakara and Tenneru (or Tenneru Conglomerate Member) Formations of the Urahoro Group at various localities of the coal field.

Introduction and Acknowledgments

The Paleogene Urahoro and Ombetsu Groups developed in the Kushiro coal field, eastern Hokkaido, yield abundant and characteristic molluscan fossils, which are called the upper Ishikarian fauna and the Poronaian fauna, respectively (MIZUNO, 1964).

The Urahoro Group, which is unconformably underlain by the Nemuro Group with unconformity and is in turn overlain by the Ombetsu Group with unconformity or partial unconformity, can be divided into four (YUI, 1975MS; HONDA, 1977MS; KAIHO, 1977MS; western area) or six (KAIHO, 1977MS, eastern area) formations; and they are the Rushin (Beppo, Harutori and Tenneru), Yubetsu, Shitakara and Shakubetsu Formations.

The Shitokara Formation was proposed by SASA (1940) and its type locality is located around the Yubetsu Coal Mine, Shiranuka-machi, Shiranuka-gun, central part of the coal field. The formation name has been applied to every part of the coal field. The formation developed in the Tokomuro, Ombetsu and Kamicharo districts, western and central parts of the coal field, is composed of gray fine-grained sandstone, pebbly to granular conglomerate and dark gray sandy siltstone. These lithologies gradually grades with each other laterally. The conglo-

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Table 1. Correlation table in the Tokomuro ((I) ; YUI, 1975MS), Ombetsu ((II) ; HONDA, 1977MS, *partly revised*), and Kamicharo (western (II) and eastern (III) areas; KAIHO (1977MS) districts. (1), Ichigozawa Coal-bearing Member; (2), or Kamicharo Formation (unconformably overlain by the Terrace deposits and conformably underlain by the Nuibetsu Formation) ; (a), or conformity between the Kamicharo and Nuibetsu formations; (b), or partial unconformity.

AGE	GROUP	FORMATION (MEMBER) (I)	(II)	(III)
Holoc.		Alluvium	Alluvium	Alluvium
Pleist.		Terrace deposits	Terrace deposits	Terrace deposits
Plio.		Hombetsu Formation		
Miocene	Atsunai Group		Shiranuka Formation	
Miocene	Atsunai Group	Atsunai Formation (upper part / lower part)	Atsunai Formation	
Miocene	Atsunai Group	? Tokomuro F.	Tokomuro F. (2) (a)	Kamicharo Formation
Oligocene	Ombetsu Group	Nuibetsu F. (upper p. / lower part)	Nuibetsu Formation	Nuibetsu Formation
Oligocene	Ombetsu Group	Charo Formation (Rushingawa Tuff breccia M.)	Charo Formation	Charo Formation
Oligocene	Ombetsu Group	Omagari Formation	Omagari Formation (b)	Omagari Formation
Oligocene	Urahoro Group	Shakubetsu F.	Shakubetsu F.	Shakubetsu F.
Oligocene	Urahoro Group	Shitakara Formation	Shitakara Formation	Shitakara F. (upper member / middle member / lower member)
Oligocene	Urahoro Group	Yubetsu Formation	Yubetsu Formation	Yubetsu F. (Soun Siltstone Member / Yubetsu Coal-bearing M.)
Oligocene	Urahoro Group	Rushin Formation	Rushin Formation	Tenneru Formation
Oligocene	Urahoro Group			Harutori Formation
Oligocene	Urahoro Group			Beppo Formation
Late Cret.-Paleoc.	Nemuro G.	Kawaruppu F. (upper part (1), u. / lower part, l.)	Kawaruppu Formation	
Late Cret.-Paleoc.	Nemuro G.	Katsuhira Formation		

merate consists predominantly of red chert gravels. In the northeastern part of the area (KAIHO, 1977MS, eastern area), the formation generally demonstrates an upward succession of sandstone, sandy siltstone and sandstone, and these units are termed into the lower, middle and upper members, respectively. The formation attains a thickness of 100 to 200 m.

The formation is conformably underlain and overlain by the Yubetsu and Shakubetsu Formations, respectively. Its base is defined by a fine-grained sandstone, which gradually grades downward into a very fine-grained sandstone of the underlying Yubetsu Formation. The top

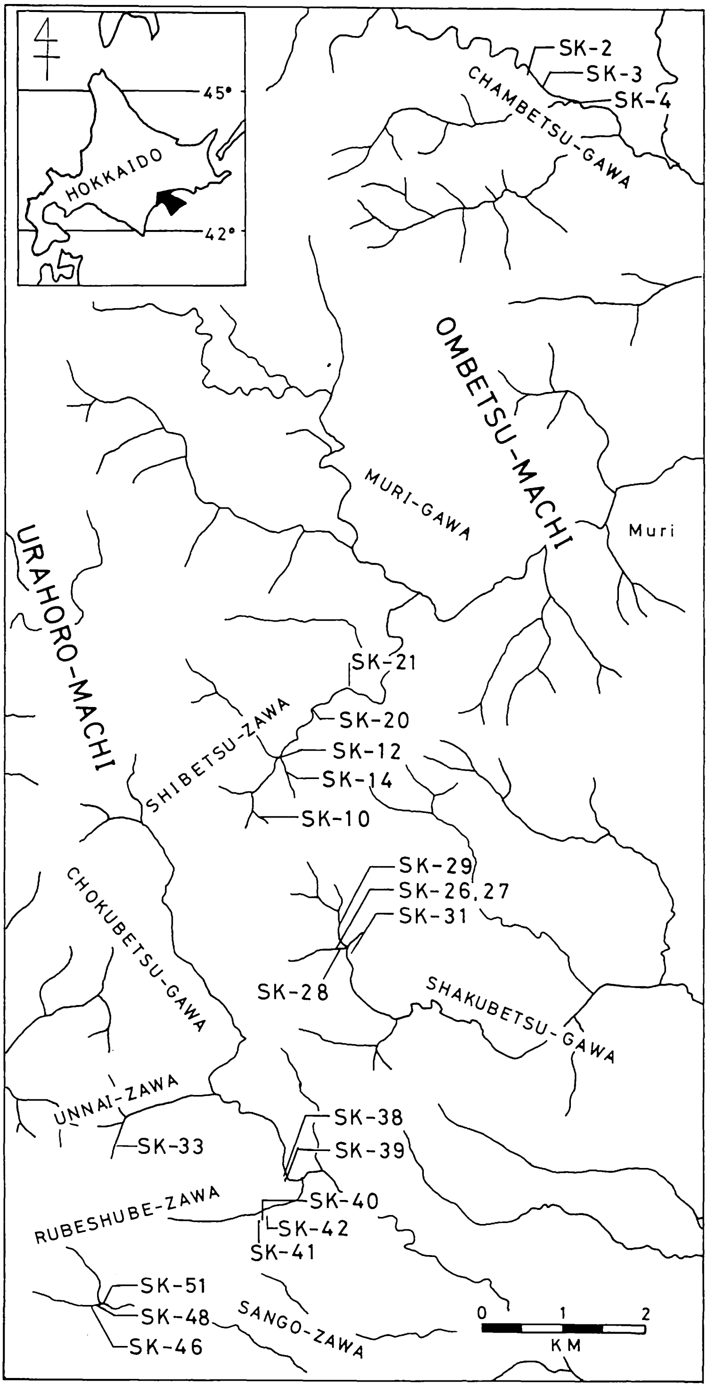

Fig. 1. Map of the Ombetsu district indicating fossil localities. (Localities B-02 and B-06 of the Tokomuro district are situated in the western perimeter of the Ombetsu district; and localities SKK-5, and SKK-12 of the Kamicharo district are situated in the northeastern perimeter of the Ombetsu district).

of the formation is defined by a conglomerate coming a mudstone which is intercalated with coal seams of the lower part of the Shakubetsu Formation. A stratigraphic correlation table covering the Tokomuro, Ombetsu and Kamicharo districts is shown in Table 1.

The Shitakara Formation yields molluscan fossils which are shallow sea or brackish water dwellers. The fauna includes such species as *Mytilus mabuchii* OYAMA and MIZUNO, *Chlamys shitakaraensis*, n. sp., *Ostrea eorivularis* OYAMA and MIZUNO, *Corbicula sitakaraensis* SUZUKI, *Nemocardium ezoense* TAKEDA, *N. yokoyamai* TAKEDA, *Hubertschenckia ezoensis* (YOKOYAMA), *Macoma sejugata* (YOKOYAMA), *Mya grewingki grewingki* MAKIYAMA, *M. grewingki kusiroensis* NAGAO and INOUE, *Thracia* n. sp., "*Ampullina*" *asagaiensis* MAKIYAMA, etc.

A total of seven species of *Chlamys*, which are much fewer than those known from Neogene formations of Japan, has been described from Oligocene or Oligo-Miocene formations of Japan by several authors; and these are *Chlamys akahirensis* KANNO, 1958, from the Nenokami Sandstone of Saitama Prefecture, *Ch.* (s. s.) *ashiyaensis* (NAGAO, 1928) from the Yamaga and Wakita Formations of Fukuoka Prefecture, *Ch.* (s. s.) *misakiensis* KATTO, 1960 from the Misaki Formation of Kochi Prefecture, *Ch.* (s. s.) *nagaoi* MASUDA, 1962, from the Wakita Formation of Fukuoka Prefecture, "*Ch.*" *onishibetsensis* KUBOTA, 1951, from the Onishibetsu Formation of Hokkaido, *Ch.* (*Coralichlamys*?) *rutteni* MARTIN of MIZUNO (1952) from the Fukuura Tuff of the Oshima Formation of Nagasaki Prefecture, and *Ch.* (s. s.) *sakitoensis* (NAGAO, 1928) from the Itanoura Formation of Nagasaki Prefecture (*compiled from:* HATAI and NISIYAMA, 1952; MASUDA, 1962a; MASUDA and NODA, 1976). Among these species, *Ch. rutteni* of MIZUNO(1952) is considered to be a synonym of *Ch. sakitoensis* as treated by MASUDA (1962a).

In the present paper, the writer describes and discusses a new species of *Chlamys* based on several tens of specimens collected from the Shitakara Formation of the Urahoro Group in the western and central parts of the Kushiro coal field. A map of the Ombetsu district indicating fossil localities is shown in Fig. 1.

The writer expresses his deep gratitude to Professor Tamio KOTAKA, Institute of Geology and Paleontology, Tohoku University, for his continuous encouragements during the course of the present study and his critical reading of the manuscript. Deep appreciation is also expressed to Professor Kôichirô MASUDA, Department of Geology, Miyagi University of Education, and Dr. Kenshiro OGASAWARA, Institute of Geology and Paleontology, Tohoku University, for their valuable advice to the present study. The writer is also indebted to Mr. Shohei OTOMO of the Tohoku University for his aid in photographic work.

Description of New Species

Family Pectinidae

Subfamily Chlamydinae

Genus *Chlamys* RÖDING, 1798

Chlamys shitakaraensis HONDA, n. sp.

Pl. 30, Figs. 1, 2, 5, 6

Description:—Shell moderate to large, rather thin, suborbicular, somewhat inequilateral and weakly inflated. Height of shell nearly equal to length. Anterior and posterior dorsal margins nearly straight, and connected with well-roun-

Table 2. Measurements (in mm.) of *Chlamys shitakaraensis*, n. sp.

IGPS coll. cat. no.	Loc. no.	Height	Length	H/L(%)	HL	AHL	PHL	AHL/PHL	AA	No. of ribs	Valve
95439 (Holotype)	B-06	53.0	57.1	92.8	41.3	25.3	16.0	1.58	101°	23	Right
96213 (Paratype)	SK-3	ca. 63	ca. 60	105	31.9	19.2	12.7	1.51	98°	21+	Left
96214 (Paratype)	SK-26	46.0	47.4	97.0	27.9	17.4	10.5	1.66	102°	26	Left
96215 (Paratype)	SK-28	82.4	ca. 84	98.1	46.6	29.8	16.8	1.77	100°	25	Right
96216	SK-40	74.9	——	——	——	——	——	——	——	23+	Right

HL, hinge-length; AHL, anterior hinge-length; PHL, posterior hinge-length; AA, apical angle

ded ventral margin. Apical angle about 100°. Surface sculptured with about more than 25, distinct, roundly topped, granulated radial ribs; which are wider than the interspaces in right valve, and much narrower in left valve. Radial ribs with one distinct longitudinal furrow. Each interspace is sculptured with one, finely granulated radial thread.

Auricles large, distinct; anterior ear about 1.5 times as long as posterior one; anterior ear of right valve oblong, with rather wide byssal area and deep byssal notch. Anterior and posterior ears of left valve trigonal, truncated both anteriorly and posteriorly at about right angle.

Anterior and posterior ears sculptured with about six to seven granulated radial ribs and fine concentric growth lines.

Internal surface of shell folded corresponding to external sculpture; auricular crura developed and resilial pit deep.

Comparison and Affinities:—The present species resembles *Chlamys akahirensis* KANNO (1958, p. 167, pl. 1, figs. 13a, b), described from the Nenokami Sandstone of the Ushikubitoge Formation of Saitama Prefecture, Central Japan, but the former differs from the latter by its less inflated right valve, smaller number of radial ribs and smaller apical angle.

It resembles *Ch.* (s. s.) *ashiyaensis* NAGAO (1928, p. 39, pl. 8, figs. 2, 5, 17, pl. 9, figs. 1, 2, 9, 20, 21; *non* pl. 9, fig. 10), described from the Yamaga Formation of the Ashiya Group of Northern Kyushu, but it is distinguished from the latter by its lower shell and more rounded radial ribs.

The present species is somewhat allied to *Ch.* (s. s.) *matchgarensis* MAKIYAMA (1934, p. 133, pl. 3, figs. 7, 8), described from horizon 5 (Marie Formation, *vide* OYAMA, MIZUNO and SAKAMOTO, 1960) of Matchgar, northern Sakhalin, USSR, but it can be discriminated from the latter in its smaller shell and much smaller number of radial ribs.

Remarks:—Many but mostly fragmental specimens were collected from a pebbly to granular conglomerate or gray fine-grained sandstone facies bearing pebbles and granules of the Shitakara Formation.

The present species probably includes the following undescribed specimens which were reported from the Shitakara and Tenneru Formations, under some invalid names (*nom. nud.*): *Chlamys kushiroensis* UOZUMI (TANAI, 1957, p. 21, table 1; MITANI, HASHIMOTO, YOSHIDA and ODA, 1959, p. 19; TANAI and YAMAGUCHI, 1965, p. 5), *Ch. kusiroensis* UOZUMI (MATSUI, FURUHATA and FUJIE, 1953a, fig. 1, p. 9, fig. 6; 1953b, fig. 1), *Ch. kusiroensis* TAKEDA (MATSUI, 1962, table 5), *Ch. mabuchii* MIZUNO (MIZUNO and HYAKKOKU, 1960, p. 19, p. 34, table 3; SATO, NAGAHAMA and YOSHIDA, 1961, table 3; MABUCHI, 1962, p. 11), and *Ch.* sp. (INOUE and SUZUKI, 1962, p. 19; SOGABE, 1967, p. 16) from the Shitakara Formation; *Ch. mabuchii* MIZUNO (MIZUNO, 1964, p. 9, table 4; p. 10, table 5) from the "Tenneru Formation" and the Shitakara Formation; *Ch.* sp. (KAWAI, 1956, p. 19, table 4) from the Tenneru Conglomerate Member of the Chorobetsu Formation. The Tenneru Formation is correlative with the upper part of the Rushin Formation of the Kushiro coal field.

Associated fauna:—The present species is commonly associated with *Nemocardium ezoense* TAKEDA (Pl. 30, Fig. 3) and *Ostrea eorivularis* OYAMA and MIZUNO (Pl. 30, Fig. 4) and sometimes with *Corbicula sitakaraensis* SUZUKI, *Mya grewingki kusiroensis* NAGAO and INOUE, *Callista* sp., etc.

MIZUNO (1964) recognized four molluscan assemblages in the Shitakara Formation in the Kushiro coal field, and his "IV assemblage" found in a coarse- to medium-grained sandstone is characterized by *Chlamys mabuchii* MIZUNO (MS) and is associated with *Mytilus, Modiolus, Corbicula, Pitar, Callista, Spisula, Calyptraea, Buccinulum, Nemocardium, Ostrea, Polinices,* etc.

Locality and Formation:—

B-02: a northwestern tributary of the Tokomuro-gawa, Urahoro-machi, Tokachi-gun, Hokkaido (Lat. 42° 55′ 10″N, Long. 143° 42′ 38″E; *Coll.* YUI, 1975MS).

B-06: a small northeastern tributary of the Urahoro-gawa, about 3.8 km north of Rushin, Urahoro-machi, Tokachi-gun, Hokkaido (Lat. 42° 56′ 55″N, Long. 143° 40′ 00″E; *Coll.* YUI, 1975MS) (Type locality).

SK-2: a roadside cliff along the Chambetsu-gawa, Ombetsu-machi, Shiranuka-gun, Hokkaido (Lat. 43° 00′ 26″N, Long. 143° 49′ 44″E).

SK-3: a river bed of the Chambetsu-gawa, Ombetsu-machi, Shiranuka-gun, Hokkaido (Lat. 43° 00′ 21″N, Long. 143° 49′ 53″E).

SK-4: a river side cliff along the Chambetsu-gawa, Ombetsu-machi, Shiranuka-gun, Hokkaido (Lat. 43° 00′ 15″N, Long. 143° 50′ 11″E).

SK-10: a river bed of the upperstream of the Shibetsu-zawa, a tributary of the Muri-gawa, Ombetsu-machi, Shiranuka-gun, Hokkaido (Lat. 42° 55′ 28″ N, Long. 143° 47′ 18″E).

SK-12: a river side cliff along the middle course of the Shibetsu-zawa, a tributary of the Muri-gawa, Ombetsu-machi, Shiranuka-gun, Hokkaido (Lat. 42° 55′ 50″N, Long. 143° 47′ 27″E).

SK-14: a river bed of the Shibetsu-zawa, a tributary of the Muri-gawa, Ombetsu-machi, Shiranuka-gun, Hokkaido (Lat. 42° 55′ 45″N, Long. 143° 47′ 33″E).

SK-20: ditto (about 750 m lowerstream of SK-12) (Lat. 43° 56′ 11″N, Long. 143° 47′ 47″E).

SK-21: a river side cliff along the Shibetsuzawa, a tributary of the Muri-gawa, Ombetsu-machi, Shiranuka-gun, Hokkaido (Lat. 42° 56′ 21″N, Long. 143° 48′ 7″E).

SK-26: a river side cliff along the upperstream of the Shakubetsu-gawa, Ombetsu-machi, Shiranuka-gun, Hokkaido (Lat. 42° 54′ 36″N, Long. 143° 48′ 00″ E).

SK-27: ditto (about 3 m lower horizon of SK-26) (Ditto).

SK-28: ditto (about 25 m lowerstream of SK-27) (Lat. 42° 54′ 36″N, Long. 143° 48′ 2″E).

SK-29: a river bed of the Shakubetsu-gawa, Ombetsu-machi, Shiranuka-gun, Hokkaido (Lat. 42° 54′ 45″N, Long. 143° 48′ 2″E).

SK-31: a river side cliff along the Shakubetsu-gawa, Ombetsu-machi, Shiranuka-gun, Hokkaido (Lat. 42° 54′ 34″N, Long. 143° 48′ 9″E).

SK-33: a river side cliff along the Unnaizawa, a tributary of the Chokubetsugawa, Uraharo-machi, Tokachi-gun, Hokkaido (Lat. 42° 53′ 15″N, Long. 143° 46′ 2″E).

SK-38: a river side cliff along the Chokubetsu-gawa, Tokachi-gun, Hokkaido (Lat. 42° 53′ 3°N, Long. 143° 47′ 33″E).

SK-39: ditto (about 25 m SW of SK-38) (Lat. 42° 53′ 3″N, Long. 143° 47′ 33″E).

SK-40: a river side cliff of the Rubeshubezawa, a tributary of the Chokubetsugawa, Urahoro-machi, Tokachi-gun, Hokkaido (Lat. 42° 52′ 47″N, Long. 143° 47′ 22″E).

SK-41: a river side cliff along a small southern tributary of the Rubeshubezawa, a branch of the Chokubetsugawa, Urahoro-machi, Tokachi-gun, Hokkaido (Lat. 42° 52′ 45″N, Long. 143° 47′ 20″E).

SK-42: ditto (about 120 m NE of SK-41) (Lat. 42° 52′ 49″N, Long. 143° 47′ 22″E).

SK-46: a river bed of the upperstream of the Sango-zawa, a tributary of the Chokubetsu-gawa, Urahoro-machi, Tokachi-gun, Hokkaido (Lat. 42° 52′ 10″N, Long. 143° 45′ 49″E).

SK-48: ditto (about 40 m lowerstream of SK-46) (Lat. 42° 52′ 11″N, Long. 143° 45′ 51″E).

SK-51: ditto (about 90 m ENE of SK-48) (Lat. 42° 52′ 13″N, Long. 143° 45′ 56″E).

SKK-2: a river bed of the Satombetsugawa, 5,980 m upperstream from the mouse of the valley, Ombetsu-machi, Shiranuka-gun, Hokkaido (Lat. 43° 5′ 16″N, Long, 143° 49′ 38″E; *Coll.* KAIHO, 1977MS).

SKK-5: a river side cliff of the Shûtonaigawa, 5,550 m upperstream from the mouse of the valley Shiranuka-machi, Shiranuka-gun, Hokkaido (Lat. 43° 6′ 13″N, Long. 143° 49′ 51″E; *Coll.* KAIHO, 1977MS).

SKK-12: a river side cliff along the Nananosawa, a tributary of the Shin-Nuibetsugawa, Shiranuka-machi, Shiranuka-gun, Hokkaido (Lat. 43° 8′ 15″N, Long. 143° 56′ 33″E; *Coll.* KAIHO, 1977MS).

All the localities are of the Shitakara Formation and locality SKK-12 represents the lower part of the Shitakara Formation.

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Explanation of Plate 30

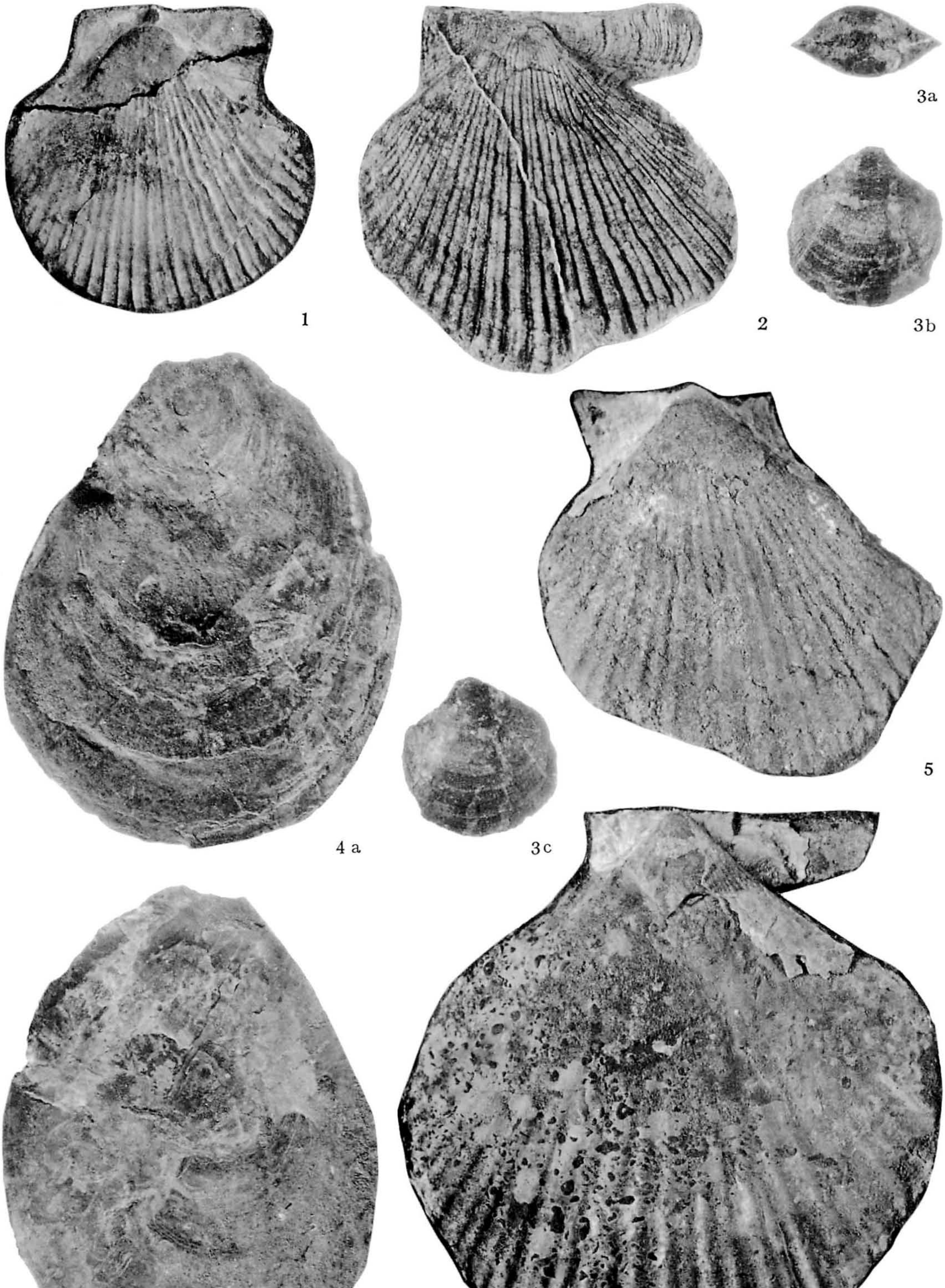
(All figures in natural size)

Figs. 1, 2, 5, 6. *Chlamys shitakaraensis* HONDA, n. sp. fig. 1, IGPS* coll. cat. no. 96214 (Paratype), Loc. SK-26, inner mold; fig. 2, IGPS coll. cat. no. 95439 (Holotype), Loc. B-06, rubber cast from right valve; fig. 5, IGPS coll. cat. no. 96213 (Paratype), Loc. SK-3; fig. 6, IGPS coll. cat. no. 96215 (Paratype) Loc. SK-28.

Figs. 3a-c. *Nemocardium (Arctopratulum) ezoense* TAKEDA. IGPS coll. cat. no. 96250, Loc. SK-40.

Figs. 4a, b. *Ostrea eorivularis* OYAMA and MIZUNO. IGPS coll. cat. no. 96251, Loc. SK-40.

* Abbreviation for the Institute of Geology and Paleontology, Tohoku University, Sendai, Japan.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Atsunai 厚内, Beppo 別保, Chambetsu-gawa チャンベツ川, Charo-gawa 茶路川, Chokubetsu-gawa 直別川, Chorobetsu チョロベツ, Harutori 春採, Hombetsu 本別, Kamicharo 上茶路, Katsuhira 活平, Kawaruppu 川流布, Muri-gawa 霧里川, Nanano-sawa 七の沢, Shin-Nuibetsu-gawa 新縫別川, Ombetsu 音別, Rubeshube-zawa ルベシュベ沢, Rushin 留真, Sango-zawa 三号沢, Satombetsu-gawa サトンベツ川, Shakubetsu-gawa 尺別川, Shibetsu-zawa シベツ沢, Shiranuka 白糠, Shitakara 舌辛, Shûtonai-gawa シユウトナイ川, Soun 双運, Tenneru 天寧, Tokachi 十勝, Tokomuro 常室, Unnai-zawa ウンナイ沢, Urahoro 浦幌, Yubetsu 雄別

北海道東部釧路炭田浦幌層群舌辛層からの *Chlamys* の一新種：北海道東部，釧路炭田の古第三系は下部の浦幌層群と上部の音別層群とに区分され，多くの特徴的な軟体動物化石を産する。前者および後者の軟体動物化石群はそれぞれ，上部石狩動物群，幌内動物群と呼ばれる (MIZUNO, 1964)。釧路炭田西部から中央部にかけての常室，音別，上茶路地域に分布する浦幌層群舌辛層は細粒砂岩，中〜細礫岩，砂質シルト岩などから成り，*Nemocardium ezoense*, *Ostrea eorivularis*, *Mya grewingki kusiroensis*, *Corbicula sitakaraensis* などの浅海ないし汽水性の軟体動物化石を多産する。筆者は舌辛層の中〜細礫岩または中〜細礫を含有する細粒砂岩中の27地点から採集された，数十個体の標本に基づき *Chlamys* の一新種を記載し，報告する。本種は従来，釧路炭田各地の浦幌層群舌辛層およびその下位の天寧層（天寧礫岩部層）から未記載のまま報告されていた種々の *Chlamys* と同一の種と考えられる。 本田 裕

PROCEEDINGS OF THE PALAEONTOLOGICAL SOCIETY OF JAPAN

学会記事

○1980年1月24日に筑波大学で行なわれた定例評議員会において，次の諸君の入退会と特別会員への推薦が承認された（敬称略)。[入会] 吉田照喜，三枝利光，宮下治，大久保敦，佐藤時幸，辻井正則，池原研，相田吉昭，中井均，野村隆光（以上10名1979年度より入会)，稲葉良一，高橋武美，古市光信，田口栄次，松本達也，二本木光利，佐藤良嗣，風間敏，佐藤勉，板垣久治，佐藤芳雄，川下由太郎，Frydl, Paul，香川良道，高崎郷二，西村はるみ，林慶一，船津宏，小林博明，桃井京子，片山敏男，荒川真司，野村宏美，戸塚洋子，久家直之，松浦信臨，磯崎行雄，鈴木茂，前田晴良，大路樹生（以上30名1980年度より入会）

[退会] 沢秀生，吉本裕一，角倉泰彦（以上3名）

[特別会員] 酒井豊三郎，増田富士雄，松隈明彦，清水大吉郎，両角芳郎，八尾昭，猪郷久治（以上7名）

なお，現会員数は次の通りである。賛助会員9，名誉会員7，特別会員177，普通会員359，在外会員63，計615名。

○同評議員会で賞の委員の半数改選を行ない，小畠郁生・斎藤常正の両君を選出した。1980年度賞の委員会は上記2名のほか，会長，首藤次男，棚井敏雅の5名で構成される。

○1979年9月に行なわれた関連5学会の協議の結果，昭和55・56年度科学研究費配分委員（層位古生物・1段）に本会推薦の斉藤常正が候補となった。その結果，55年度配分委員は地質学2段に大久保雅弘（留任)，地質学一般1段に赤木三郎（留任)，柴崎達雄，光野千春，層位古生物学1段に猪郷久義（留任・本会推薦)，中村耕二（留任)，斉藤常正（本会推薦）がそれぞれ内定した（敬称略)。

○前記評議員会で特別号の投稿・編集方針について審議し，レフェリー制度を採用すること，原稿の体裁は報告記事の原稿に準ずること，原稿募集の締切りを毎年5月末日（ただし本年に限り6月末日）とすることを申し合わせた。

○1980年1月25日の日本古生物学会総会で，日本古生物学会報告記事編集出版規約（本誌114号参照）の一部改正が承認された。[ ] 内は旧条文

Ⅱ 投稿

ⅡA 資格

-2 投稿論文は欧文（英・仏・独のいずれかが望ましい）で**書かれたものとする。**[書かれたもので，本学会の年会・例会等で講演されたものとする。]

ⅡB 執筆制限

-1 原稿はタイプスクリプトとする。原著論文では，挿図，表などを含めて24印刷頁，および図版3 [2] **葉**を限度とする。ただし，5～**8印刷頁の論文は図版2葉を限度とし，**4印刷頁以内の論文については，とくに認められた場合を除いて図版を付さない。短報類は1印刷頁以内とし，かつ図版を用いないものとする。

○1979年度日本古生物学会論文賞は，矢島道子君の "Quaternary Ostracoda from Kisarazu near Tokyo"（報告・記事112号）に授与された。

○1979年度日本古生物学会学術賞（従来の学術奨励金を今回より名称を変更）は，中世古幸次郎君（放散虫化石の化石層位学的研究）と森啓君（化石層孔虫を中心とする腔腸動物の研究）に授与された。

日本古生物学会1980年総会・年会は1980年1月25日（金）・26日（土）に筑波大学大学会館において開催された（参会者122名)。

海外学術集会出席報告

Cretaceous—Tertiary boundary events (Copenhagen) ....吉田三郎・田代正之

The Systematics Association Symposium "The Ammonoidea" (York) .... 棚部一成・松本達郎・蟹江康光

Symposium on the Cretaceous major transgressions and regressions (London) .... 松本達郎

第2回全中国地層会議（北京）..........木村達明

Triassic of the Tethys realm (Budapest)....
.... 小池敏夫
第9回国際石炭紀会議（Illinois）......猪郷久義
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化石珪藻の休眠胞子とその親細胞との関係に関する考察再報 ....小村精一
北海道天北新第三系産中心目小判形珪藻1新属3新種 ....小村精一
苗代田層産貝化石群について .... 菅野三郎・二階堂章信・菊池芳文
三浦半島南部の新第三系初声層産軟体動物化石について ....菅野三郎・奥村清・山岸 稜
Some Neogene arcid fossils from Okinawa, Kyushu, Japan ....NODA, H.
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Fossil sclerosponges from the Ryukyu Group of Miyako-jima and their significance as rock builders..MORI, K. and NAKAMORI, T.
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Early Cretaceous bivalves from the "Ubaishi Formation", southern Kitakmi Mountains, Japan ....OGASAWARA, K.
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Remarks on the mode of life in ammonites .... OBATA, I., TANABE, K., HIRANO, H., FUKUDA, Y. and FUTAKAMI, M.
微細構造と元素組成からみたジュラ紀，白亜紀アンモナイト数種のアプチクスの機能について.. .... 福田芳生・小畠郁生・棚部一成・平野弘道
Nautilus pompilius と *N. macromphalus* の殻の微細構造について......................

1979年度 日本古生物学会論文賞推薦文

矢島道子君: Quaternary Ostracoda from Kisarazu near Tokyo. *Trans. Proc. Palaeont. Soc. Japan*, N.S., No. 112, pp. 371-409, pls. 49, 50, 1978

本論文は，千葉県木更津周辺地域の海成更新統より産出する介形虫の群集構成を，古環境変遷の輪廻との関連において解析したもので，内湾砂底，内湾泥底および シルト質砂底の3群集の内容が簡潔で明確に記載されている。本論文には二つの特色が見られる。一つは古生物を理解するためには地層中に残された情報を，どのように解析し綜合するのがよいかについて，一つの試案を示そうとしていることであり，要を得た野外観察の上に，介形虫を取りまく環境の変遷を示すのに都合のよいように，輪廻性を重視して層序がまとめられている。他の一つは種属の同定の確実なことである。最近に急激に増加しまだ体系だてられていない介形虫の属グループタクサの分類を，自分なりに整理し，それに基づいて，現代的な属の同定を行っており，若干の属は日本より初めての報告となっている。更に産出した新種は全部記載し，リスト中の種の同定を信頼のおけるものとしている。これを要するに，本論文は介形虫群集の記載の基本に従い，しかも新しい形でまとめようとする意欲の見られる論文と考え，日本古生物学会は矢島道子君に論文賞を贈る。

1979年度日本古生物学会学術賞推薦文

中世古幸次郎君：放散虫化石の化石層位学的研究

海洋微古生物の研究は20世紀において著しく進捗した。特に後半に入って以来急速な展開を見た浮遊性微古生物の化石層位学は，地球年代史の編さんは不可欠の手段となったばかりでなく，古海洋の構造と変遷を究明する基礎を提供するものである。

わが国はおいては，放散虫化石の研究が他の浮遊性微古生物のそれに先んじて着手されており，1920年代に四国の四万十帯・秩父累帯から報告されたのをきっかけに，その他の地域の中・古生界からの報告が行われた。しかしながら，新生界のものについては，中世古君の富山県南部の八尾層群の研究（1954～55）が最初であり，その後同君ないし同君と協力者達によって，主として日本海側の新第三系を対象とする微化石層位学的研究が精力的に進められた。これらの研究は，多数の地表セクションにおける微化石層序の綿密な検討，産出化石の記載，そして群集帯の識別に基づいて行われたが，対象地域は秋田・山形・新潟・富山の各堆積盆地から太平洋岸の一部にまで及んだ。これらの結果は，1972年の日本海沿岸新第三系の放散虫化石による分帯となり，さらに翌年の日本の新第三系の化石帯区分の設定へと結実した。これがすなわち中新統より鮮新統にわたる *Melittosphaera magnaporulosa* 帯，*Cyrtocapsella tetrapera* 帯，*Lychnocanium nipponicum* 帯，および *Thecosphaera japonica* 帯の4帯である。この分帯は，日本列島とりわけ日本海沿岸の如き地域では，群集の層位的変化が必ずしも構成種の生存期間を反映せず，環境の変動により左右されていた側面を十分に考慮した上で，広域対比に用いうる群集型を選び，他の微化石帯区分との関係をも吟味して，設定したものであることが特色となっている。

中世古君は，その後四万十帯の放散虫化石の研究を開始し，1976年に徳島県下の四万十帯より白亜紀の放散虫群集を見出して以来，研究指導者として，共同研究者達と共に，志摩半島・紀伊半島・高知・宇和島等より白亜紀・第三紀の放散虫群を続々発見し，最上部をのぞく白亜系の各層準より

放散虫化石の産出することを明らかにしている。また，調査は丹波帯・美濃帯・三宝山帯にも及び，チャート・泥岩凝灰岩・石灰岩等各種の堆積岩よりペルム紀・三畳紀・ジュラ紀等の各時代の放散虫を発見し，その一部はすでに報告されている(1979)。

これらの同君の研究活動は，北西太平洋の陸域における放散虫化石層序の確立のための重要な貢献であり，深海底堆積物を含む海成古・中・新生界の国際対比の基準を提供することになろう。よって日本古生物学会はここに学術賞を贈り，今後のいっそうの発展を期待するものである。

森　啓君：化石層孔虫を中心とする腔腸動物の研究

古生代一中生代を通じて，生礁およびその周辺における造構造生物として重要な層孔虫類の研究は，これまでに記載学的な面での進展はあったにかゝわらず，その生層序学上の意義に関しては，あまり深く追究されない傾向があった。

森君は，Gotland 島を中心としてスウェーデン，ノルウェーに産する豊かなシルル紀層孔虫群に着目し，その保存良好な点を十分に活かしながら精密かつ現代的な系統分類学的記載を行なった。層孔虫群体の形態変化は層相変化と深い相関をもつことを見出し，その古生態学的考察を試みるとともに，それらが示相化石として有効であるばかりでなく，生層序学的にも十分な資格を有し，地域対比に適用できることを実証した。

これら一連の研究は，旧来の研究のおくれている部分を補完し，層孔虫の古生物学的・古生態学的理解に大きく寄与するのみならず，化石礁とその周辺の古環境発達史の解析に多大の影響をもつものであり，その意義は大きい。

森君はさらに，層孔虫類の大分類上の位置付けに関する最近の諸説，とりわけ硬骨海綿 (Sclerosponges) とする Hartman らの見解に対し，石垣島やパラオ島から初めて現生硬骨海綿を報告するとともに，むしろ否定的な意見をのべ，改めて腔腸動物とみる方向で更に検討を加える必要があることを示唆している。

これらの研究は，層孔虫類を亜科に置くか，あるいは独立した科と認めるかなど，残された今後の大問題に対して，強い刺激となっているのは間違いない。

腔腸動物の典型である石さんご類に対しても森君は深い関心を寄せており，とくにその壁構造の形成メカニズムに関して，従来の認識には誤った点があることを指摘している。すなわち，*Acrhelia* や *Galaxia* を材料にして，それらの wall は二次的に septa からもたらされるのではなく，むしろ septa そのものが wall から形成されるものであることを，詳細な連続薄片観察から証明した。

この研究により，腔腸動物の系統分類学的基礎として，wall の構造解析が従来考えられていた以上に重要であることが判明したのである。

以上を要するに，森君の層孔虫類を中心とした化石腔腸動物等の研究は，観点・手法・成果ともに，旧来の研究を凌駕する高水準にあることを示している。よって日本古生物学会は，ここに学術賞を贈ってこれを賞し，今後の一層の発展を期待するものである。

日本古生物学会特別号の原稿募集

PALAEONTOLOGICAL SOCIETY OF JAPAN, SPECIAL PAPERS, NUMBER 25 を 1981 年度に刊行したく，その原稿を公募します。適当な原稿をお持ちの方は，次の事項に合わせて申込書を作成し，原稿の写しを添えて，〒812 福岡市東区箱崎 九州大学理学部地質学教室気付，日本古生物学会特別号編集委員会（代表者首藤次男）宛に申し込んで下さい。

(1) 古生物学に関する論文で，欧文の特別出版にふさわしい内容のもの。同一の大題目の下に数篇の論文を集めたもの（例えばシンポジュウムの欧文論文集）でもよい。分量は従来発行の特別号に経費上ほぼ匹敵すること。学会以外からも経費が支出される見込のある場合には，その金額に応じて上記よりも分量が多くてよい。

(2) 内容・文章ともに十分検討済の完成した原稿で，印刷所に依頼して正確な見積りを算出できる状態にあること。申込書とともに必ず原稿の写しを提出して下さい。(用済の上は返却致します)。

(3) 申込用紙は自由ですが，次の事項を明記し，〔 〕内の注意を守って下さい。

(a) 申込者氏名；所属機関または連絡住所・電話番号。〔本会会員であること〕。

(b) 著者名；論文題目。〔和訳を付記すること〕。

(c) 研究内容の要旨。〔800〜1,200 字程度，和文で可〕。

(d) 内容ならびに欧文が十分検討済であることの証明。〔校閲者の手紙の写しでもよい〕。

(e) 本文の頁数（刷上り見込頁数または原稿で欧文タイプ 25 行詰の場合の枚数 — ただし，パイカーかエリート字体かを添記すること）；また本文中小活字（8 ポ組み）に指定すべき部分があるときは，そのおよその内訳（総頁に対するパーセント）；挿図・表の各々の数と刷上り所要頁数；写真図版の枚数。

(f) 他からの印刷経費支出の見込の有無，その予算額，支出源。〔その見込の証明となる書類またはその写しを添えて下さい〕。

(g) その他参考事項。

(4) 申込及び原稿提出締切 1980 年 6 月 30 日（必着）。採否は編集委員会が必要に応じレフェリーと相談の上内定し，1981 年 1 月の評議員会で審議決定の上，申込者に回答の予定です。ただしその前または後に，申込者との細部の交渉を，編集委員から求めることがあるかもしれません。

(5) 上記 (f) の他からの印刷経費支出の見込みがない場合は，1978 年度の文部省刊行助成金（「研究成果刊行費補助金」）を申請いたしますので，上記 (2) の条件がみたされている場合にのみ考慮されます。

(6) 論文が完全な場合には，評議会での決定後できるだけ早く印刷にとりかかる予定です。文部省の刊行助成金の申請は，学会から行ない（例年は 11 月末に申請締切），その採否・金額など決定後印刷にとりかかります。その場合は文部省との約束により，その年の秋（前例では 10 月 20 日）までに初校が全部出なければ，補助金の交付が中止されることになっています。

(7) 特別号の原稿は会誌に準じ，前例を参考として作成して下さい。不明の点は編集委員会に問い合わせて下さい。経費がかかるので，特別な場合を除き，別刷は作成せず，本刷 25 部を著者に無料進呈します。それ以上は購入（但し著者には割引）ということになります。いくつかの論文を集めて 1 冊にするときには，世話人の方から指示して，体裁上の不統一のないようにして下さい。印刷上の指示事項が記入できるよう，原稿の左右両側・上下に十分空白をとって，タイプで浄書して下さい。

○文部省出版助成金が得られなかった場合には，出版を繰延べることがあるかもしれません。
○原稿の完全を期するため今回から締切日を早めることになりました。

行事予定

	開催地	開催日	講演申込締切
第125回 例会	高知大学	1980年6月29日	1980年4月29日
第126回 例会	富山大学	1980年10月	1980年8月
1981年総会・年会	東北大学	1981年1月	1980年11月

講演申込先：〒113 東京都文京区弥生2-4-16 日本学会事務センター 日本古生物学会行事係

6月29日（日）の第125回例会ではシンポジウム「四万十帯の生層序学の現状と今後の問題点」が，6月30日（月）には高知県佐川地方への巡検が予定されている。

編集係より

○1979年度に投稿原稿の校閲者として尽力された諸兄に感謝いたします（御氏名は申し合わせにより公表いたしません）。

お知らせ

○本年度より賞の委員会委員の半数改選にともない幹事が交代しました。1980年度中の各種の賞に関する問合せ，推薦依頼は小畠郁生（国立科学博物館地学部）にお願いします。その他の委員の役割分担と連絡先（本誌115号参照）には変更ありません。

○特別号 No. 17 の OYAMA, K: **Revision of Matajiro Yokoyama's type Mollusca from the Tertiary and Quaternary of the Kanto Area,** 148 pp. 57 pls. は昨年売切れとなり御迷惑をかけておりましたが，近日中に再版されることになりました（定価4700円，送料300円）。購入申込は特別号の他の号と同じく特別号編集委員会首藤次男・柳田寿一（福岡市東区箱崎九州大学理学部地質学教室）（送金先：振替口座福岡19014；三和銀行福岡支店普通預金口座12172）にお願いします。郵送によらない直接販売は東京大学総合研究資料館（速水格気付）および国立科学博物館分館（藤山家徳気付）でも取扱う予定です。

◎ 文部省科学研究費補助金（研究成果刊行費）による。

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