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463. UPPER MIOCENE FORAMINIFERA FROM THE KIYOSUMI FORMATION, BOSO PENINSULA*

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房総半島清澄層からの上部中新世有孔虫：小櫃川上流地域から清澄フォーナの主要構成種，特徴種あわせて 17 種を記載した。新種 5 種をふくむ。 青木直昭

Introduction

Little has been studied on the foraminifera from the upper Miocene rocks of the Boso Peninsula, because they are very sparsely fossiliferous. In 1962, SAITO reported five planktonic species from the Kiyosumi formation, including *Globigerina nepenthes* TODD and *Globorotalia menardii miocenica* PALMER, and he considered that the middle horizon of the Kiyosumi formation is correlative with the Venezuelan *Globorotalia menardii menardii/Globigerina nepenthes* Zone.

Previously, KOMATSU (1958 MS) worked out the Miocene stratigraphy of the peninsula and he examined the foraminiferal assemblages for zoning and correlation. Recently, the writer observed the Komatsu's collection now stored in our institute, besides some materials newly obtained from the type section of the Kiyosumi. The purpose of this paper is to record the several important constituents of the Kiyosumi fauna and to describe five new species.

Acknowledgements are due to the following persons: Mr. Naomiki KOMATSU of the Teikoku Oil Company for permission to publish this paper and for kind information on stratigraphy; Dr. Takayasu UCHIO of the University of Tokyo for helpful suggestions; Dr. Yokichi TAKAYANAGI of the Tohoku University for kind permission to observe his collection from Nobori; Prof. Wataru HASHIMOTO of the Tokyo University of Education for supervision and encouragements.

Fauna

Collections were made from the three sections taken along the small tributaries of the Obitsu River, in Kazusa-machi, Kimitsu-gun, central part of the Boso Peninsula. Despite of its meagre population, about 110 benthonic species were found in 35 samples, and the fauna is dominantly composed of the following species (in the order of abundance).

Uvigerina proboscidea (SCHWAGER)
Stilostomella ketienziensis (ISHIZAKI)
Bulimina striata D'ORBIGNY
Nonion cf. *parkerae* UCHIO
"*Nodosaria*" *longiscata* D'ORBIGNY
Robulus pseudorotulatus ASANO
Bolivinita quadrilatera (SCHWAGER)
"*Eponides*" *umbonatus* (REUSS), var.
Cassidulina cf. *subglobosa* BRADY
Gyroidina komatsui AOKI, n. sp.

* Received June 15, 1963; read at 84th meeting of the Society at Sendai June 1, 1963

Uvigerina cf. *akitaensis* ASANO
Nonion pompilioides (FICHTEL and MOLL)
Pullenia bulloides (D'ORBIGNY)
Sphaeroidina bulloides (D'ORBIGNY)
Cassidulina sp.
Planulina wuellerstorfi (SCHWAGER)
Cibicides asanoi MATSUNAGA
Orthomorphina obitsuensis AOKI, n. sp.
Gyroidina profunda AOKI, n. sp.
Fissurina minima AOKI, n. sp.
Parafissurina kiyosumiensis AOKI, n. sp.
Lagena hispida REUSS
Lagena cf. *aspera* REUSS
Oolina melo D'ORBIGNY
Pyrgo murrhina (SCHWAGER)
Cibicides sp.
Gyroidina altiformis STEWART and STEWART
"*Nodosaria*" *tosta* SCHWAGER
Bulimina rostrata BRADY
Sigmoilina schlumbergeri SILVESTRI
Orthomorphina advena (CUSHMAN and LAIMING)
Epistomina elegans (D'ORBIGNY)
Fissurina annectens BURROWS and HOLLAND
Parafissurina sp. cf. *P. dorbignyana* (WIESNER)
Epistominella rotunda (HUSEZIMA and MARUHASI)
Pleurostomella alternans SCHWAGER

Description of Species

Robulus pseudorotulatus ASANO

Pl. 25, fig. 20.

Robulus pseudorotulatus ASANO, 1938, *Tohoku Univ., Sci. Rep., ser. 2, v. 19, no. 2*, p. 201, pl. 25, figs. 1, 3, 4; pl. 26, fig. 28; pl. 31, figs. 3, 6. —— ASANO, 1951, *Illust. Cat. Japan. Tert. Foram., pt. 15*, p. 6, tfs. 28, 29.

The Kiyosumi specimens are smaller (less than 2 mm. in diameter) than the typical Pliocene form of this species and have 7-9 chambers in the final whorl. The large, slightly protruded umbilicus and narrow peripheral keel are distinctive characters of this species.

It is widely known from the middle Miocene to Pleistocene of Japan and it is one of the dominantly occurred species in the Kiyosumi formation.

Fissurina minima AOKI, n. sp.

Pl. 25, figs. 1a, b.

Test very small in size, unilocular, compressed, almost circular in side view, slightly longer than broad, lenticular in apertural view, thickness about two thirds of the height of the test; margin subacute, not keeled; wall smooth, finely perforate; aperture a short slit on the periphery, with a short entosolenian tube. Length 0.15 mm., width 0.14 mm., thickness 0.09 mm. (holotype).

Holotype. Reg. no. 68001, from a riverside exposure (Sasa River), ca. 800 m. south of Katakura, Kazusa-machi, Kimitsu-gun, Chiba Prefecture: sample no. 385, lower part of the Kiyosumi formation, upper Miocene. Collected by N. KOMATSU.

This new species is characterized by its very minute and circular test and a very short entosolenian tube.

Fissurina minima is common but restricted to the mudstone member of the lower part of the Kiyosumi formation.

Parafissurina kiyosumiensis AOKI, n. sp.

Pl. 25, figs. 2a, b.

Test medium or large for the genus, unilocular, compressed, nearly circular in outline, but apertural end somewhat protruding roundly from the general outline of the test, thickness nearly two thirds of the length, lenticular both in cross section and in peripheral view; periphery acute, with a narrow keel, which broader at the lower half of the

test: wall smooth, translucent, finely perforate; aperture eccentric, an arched slit, parallel to the periphery, with a long entosolenian tube extending to the base of the interior. Length 0.26 mm., width 0.23 mm., thickness 0.16 mm. (holotype).

Holotype, Reg. no. 68002, from a river-side exposure (Kurotaki River), ca. 800 m. north of Godai-batake, Kazusa-machi, Kimitsu-gun, Chiba Prefecture; sample no. 279, middle part of the Kiyosumi formation, upper Miocene. Collected by N. KOMATSU.

This species is similar to "*Fissurina marginata* (MONTAGU)" rarely found in the Pliocene rocks of Japan, so it has often been confused with the latter species.

Parafissurina kiyosumiensis is frequently found in the lower half of the Kiyosumi formation.

"*Nodosaria*" *longiscata* D'ORBIGNY

Pl. 25, figs. 10, 11.

Nodosaria longiscata D'ORBIGNY, 1846, *Foram. Foss. Bass. Tert. Vienne*, p. 32, pl. 1, figs. 10–12 (*fide* ELLIS and MESSINA, 1940 *et seq., Catalogue of Foraminifera*). —— ASANO, 1953, *Tohoku Univ., Inst Geol. Pal., Short Pap., no. 5*, p. 8, pl. 1, figs. 20–22.

The specimens from the Vienna Basin were re-studied by MARKS (1952, *Cushman Found Foram. Res., Contr., v. 2, pt. 2*, p. 45) and *Nodosaria arundinea* SCHWAGER, 1866, from Kar Nicobar was assumed to be a synonym of this species.

Fragments of this species are abundantly found in the Kiyosumi formation.

Orthomorphina obitsuensis AOKI, n. sp.

Pl. 25, fig. 3.

Test small in size, uniserial, straight, subcylindrical, sides nearly parallel or slightly tapering; initial end rounded with a button of clear shell material; chambers distinct, about six in numer, appressed in the earlier, inflated and nearly as broad as high in the later half; sutures horizontal, somewhat indistinct in the earlier, distinct and depressed later; wall finely perforate, ornamented by numerous weak, longitudinal striations, becoming smooth at the last few chambers; aperture terminal, central, a round pore in a thick and short neck, without any tooth. Length 0.46 mm., width ca. 0.16 mm. (holotype).

Holotype, Reg. no. 68003, from a river-side exposure (Sasa River), ca. 300 m east of Katakura, Kazusa-machi, Kimitsu-gun, Chiba Prefecture; sample no. 361, upper part of the Kiyosumi formation, upper Miocene. Collected by N. KOMATSU.

This species is characterized by smaller-sized test with weak longitudinal striations on the surface and is easily distinguishable from the species belonging to the genus *Orthomorphina* STAINFORTH, 1952.

O. obitsuensis is frequently found in the Kiyosumi formation and sporadically observed in the Pliocene of the Boso Peninsula.

Stilostomella ketienziensis (ISHIZAKI)

Pl. 25, fig. 4.

Ellipsonodosaria ketienziensis ISHIZAKI, 1943, *Nat. Hist. Soc. Taiwan, Trans., v. 33, nos. 242-243*, p. 684, tfs. 1, 6, 11. ——ASANO, 1951, *Illust. Cat. Japan. Tert. Foram., pt. 15*, p. 28, tfs. 121, 122.

Several related forms to this Japanese species had been described, but the Boso

specimens were compared only with the Kechienji (Ketienzi) specimens and found to be identical. The surface of this species is smooth or ornamented with a single or double rows of numerous, weak, longitudinal spines on the lower half of each chamber.

Fragments of this species are abundant throughout the Kiyosumi formation. It is also common in the Pliocene formations of the Boso Peninsula.

Bolivinita quadrilatera (SCHWAGER)

Pl. 25, fig. 6.

Textularia quadrilatera SCHWAGER, 1866, *Novara Exped., Geol. Theil., v. 2*, p. 253, pl. 7, fig. 10.

This species is common in the middle horizon of the Kiyosumi formation.

Tosaia hanzawai TAKAYANAGI

Pl. 25, figs. 12a, b.

Tosaia hanzawai TAKAYANAGI, 1953, *Tohoku Univ., Inst. Geol. Pal., Short Pap., no. 5*, p. 30, pl. 4, figs. 7. —— GALLITELLI, 1957, *U.S. Nat. Mus., Bull., no. 215*, p. 151, pl. 34, fig. 18.

This species is first described from the upper Miocene Nobori formation, Kochi Prefecture. It is very rare and several specimens were found from six samples of the Kiyosumi formation. All are smaller and triserial throughout.

Bulimina striata D'ORBIGNY

Pl. 25, figs. 14, 15.

Bulimina striata D'ORBIGNY, CUSHMAN and PARKER, 1938, *Cushman Lab. Foram. Res., Contr., v. 14, no. 4*, p. 90, pl. 16, figs. 1-3. ——ASANO, 1953, *Tohoku Univ., Inst. Geol. Pal., Short Pap., no. 5*, p. 6, pl. 2, figs. 24, 25. ——ASANO, 1958, *Tohoku Univ., Sci. Rep., ser. 2, v. 24*, p. 8, pl. 1, figs. 4, 7, 8. ——MARKS, 1951, *Cushman Found. Foram. Res., Contr., v. 2, pt. 2*, p. 58.

This species is abundant and one of the most commonly occurred species in the Kiyosumi formation.

Uvigerina cf. *akitaensis* ASANO

Pl. 25, fig. 9.

Cf. *Uvigerina akitaensis* ASANO, 1950, *Illust. Cat. Japan. Tert. Foram., pt. 2*, p. 14, tfs. 60-62.

This form has highly raised or lamellated, longitudinal costae, which are discontinuous at the sutures. It is similar to *Uvigerina akitaensis* ASANO widely known from the Pliocene to Recent deposits of Japan, but it differs in having a shorter test and deeply incised sutures. It may represent a variety of this species.

It is frequently found in the Kiyosumi formation and common in a sample from the middle part of the Sasa River section.

Uvigerina proboscidea SCHWAGER

Pl. 25, fig. 7, 8.

Uvigerina proboscidea SCHWAGER, 1866, *Novara Exped., Geol. Thail. v. 2*, p. 250, pl. 7, fig. 96. ——CUSHMAN, 1939, *Geol. Soc. Japan, Jour., v. 46, no. 546*, p. 151, pl. 10, fig. 13. ——CUSHMAN and TODD, 1941, *Cushman Lab. Foram. Res., Contr., v. 17, no. 3*, p. 73, pl. 17, fig. 9; pl. 19, figs. 3-9. —— ASANO, 1953, *Tohoku Univ., Inst. Geol. Pal., Short Pap., no. 5*, p. 10, pl. 2, figs. 29-31. ——CHIJI, 1959, *Osaka Mus. Nat. Hist., Bull., no. 11*, p. 26, pl. 7, fig. 5.

It is commonly and characteristically found in the upper Miocene rocks of

Japan and is the most common species throughout the Kiyosumi formation.

Pleurostomella alternans SCHWAGER

Pl. 25, fig. 5.

Pleurostomella alternans SCHWAGER, 1866, *Novara Exped., Geol. Thail, v. 2*, p. 238, pl. 6, figs. 79, 80. ——CUSHMAN, 1939, *Geol. Soc. Japan, Jour., v. 46, no. 546*, p. 152, pl. 10, fig. 11.

This Kar Nicobar species is sporadically found in the Kiyosumi formation. It has been recorded from the Nobori formation, Shikoku.

"*Eponides*" *umbonatus* REUSS, var.

Pl. 25, figs. 19a-c.

The periphery of Kiyosumi specimens is narrowly rounded, differing from the Pliocene ones of this species (ASANO, 1951, *Illust. Cat. Japan. Tert. Foram., pt. 14*, p. 12, tfs. 91, 92), however, the intermediate forms between the two are often found in the present collection. Maximum diameter of the largest specimen is 0.4 mm.

This variety is frequently found in the Kiyosumi formation and is also observed very rarely in the lower Pliocene of the Boso Peninsula.

Gyroidina komatsui AOKI, n. sp.

Pl. 25, figs. 16a-c.

Test small, trochoid, ovate and slightly lobulate in side view, thickness about two thirds of the length, uneqally biconvex, dorsal surface almost flat or more or less convex, ventral side roundly convex; periphery broadly rounded; chambers 7 or 8 in the final whorl, increasing moderately in size as added; sutures distinct, slightly depressed, nearly radial, on the both sides; aperture ventral, an elongate narrow slit, arched along the base of the apertural face extending toward the umbilical area; wall thin, smooth, finely perforate. Length 0.28 mm., width 0.22 mm., thickness 0.20 mm. (holotype).

Holotype, Reg. no. 68016, from a riverside exposure (Kurotaki River), ca. 700 m. NW of Godai-batake, Kazusa-machi, Kimitsu-gun, Chiba Prefecture; sample no. 287, lower part of the Kiyosumi formation, upper Miocene. Collected by N. KOMATSU.

The present species is similar to *Gyroidina nipponica* ISHIZAKI (1944, *Nat. Hist. Soc. Taiwan, Trans., v. 34, no. 244*, p. 102, pl. 3, fig. 3) from Miyazaki, but differs in its larger number of chambers in the final whorl.

This species is named in honor of Mr. Naomiki KOMATSU, oil-geologist, Teikoku Oil Company, in recognition of his work on the Miocene stratigraphy of the Boso Peninsula.

Gyroidina komatsui is commonly found in the lower half of the Sasa and Kurotaki River sections of the Kiyosumi formation.

Gyroidina profunda AOKI, n. sp.

Pl. 25, figs. 17a-c.

Test medium, trochoid, ovate in side view, nearly equally biconvex, or ventral side more convex than the dorsal side, consisting of 2½ or 3 whorls; periphery narrowly rounded and lobulate very slightly at the later part of the test; chambers not inflated, about 7 in the final whorl; sutures somewhat indistinct, oblique or nearly radial, slightly curved, flush on the dorsal side, radial,

very slightly depressed on the ventral side; aperture ventral, an arched slit, at the middle part of the basal margin of the apertural face: wall smooth, very finely perforate. Length 0.44 mm., width 0.38 mm., thickness 0.28 mm. (holotype).

Holotype, Reg. no. 68017, from a river-side exposure (Sasa River), ca. 400 m. south of Katakura, Kazusa-machi, Kimitsu-gun, Chiba Prefecture; sample no. 368, middle part of the Kiyosumi formation, upper Miocene. Collected by N. KOMATSU.

This species is very similar to *Gyroidina gemma* BANDY (1953, *J. Pal., v. 27*, p. 179, pl. 23, fig. 4) from off California, but differs in having a more rounded and smooth periphery and fewer chambers in a whorl.

Gyroidina profunda is frequently found in the Kiyosumi formation and also common in the "lowest Pliocene" rocks of the Boso Peninsula.

Nonion cf. *parkerae* UCHIO

Pl. 25, figs. 18a, b.

Cf. *Nonion parkerae* UCHIO, 1960, *Cushman Found. Foram. Res., Spec. Publ., no. 5*, p. 60, pl. 4, figs. 9, 10.

Cf. *Nonion barleeanus* (WILLIAMSON), BANDY, 1961, *Micropaleontology, v. 7, no. 1*, p. 16, pl. 5, figs. 6.

Nonion nicobarense CUSHMAN, ISHIWADA, HIGUCHI and KIKUCHI, *Japan. Assoc. Petr. Tech., Jour., v. 27, no. 3*, pl. opposite p. 79, fig. 5.

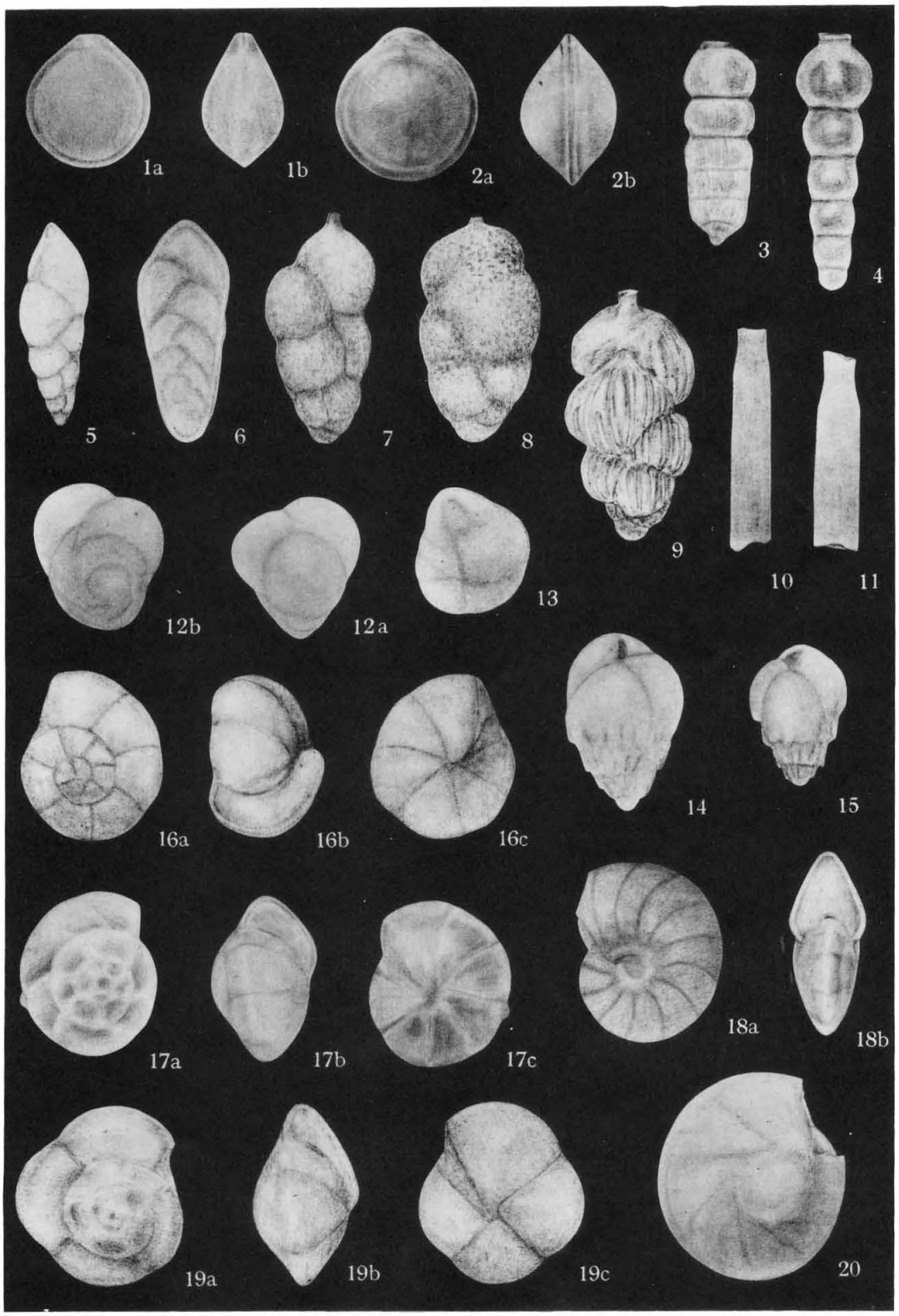
Nonion zaandamae bosoensis KUWANO, 1962, *Res. Inst. Natur. Resources, Misc. Rep., nos. 58-59*, pl. 19, fig. 9. (*nomen nudum*).

The Boso specimens are not variable in morphology and are very closely similar to this Californian species. The typical Recent form is more compressed with a slightly more angular edge, but the difference is not significant. This

Explanation of Plate 25

(a, side or dorsal view; b, edge view; c, ventral view, unless otherwise noted. Figs. 1, 3-6, 8-10, 12, 13, 15, 17, 18, 20, from Katakura; figs. 2, 7, 14, 16, 19, from Godai-batake; fig. 11, from Fudago.)

Fig. 1. *Fissurina minima* AOKI, n. sp., ×150. Holotype, Reg. no. 68001.
Fig. 2. *Parafissurina kiyosumiensis* AOKI, n. sp., ×93. Holotype, Reg. no. 68002.
Fig. 3. *Orthomorphina obitsuensis* AOKI, n. sp., ×69. Holotype, Reg. no. 68003.
Fig. 4. *Stilostomella ketienziensis* (ISHIZAKI), ×69. Reg. no. 68004.
Fig. 5. *Pleurostomella alternans* SCHWAGER, ×59. Reg. no. 68005.
Fig. 6. *Bolivinita quadrilatera* (SCHWAGER), ×48. Reg. no. 68006.
Figs. 7, 8. *Uvigerina proboscidea* SCHWAGER, ×53. Reg. nos. 68007, 68008.
Fig. 9. *Uvigerina* cf. *akitaensis* ASANO, ×85. Reg. no. 68009.
Figs. 10, 11. "*Nodosaria*" *longiscata* D'ORBIGNY, ×26. Reg. nos. 68010, 68011.
Fig. 12. *Tosaia hanzawai* TAKAYANAGI, ×100. Reg. no. 68012. b, basal view.
Fig. 13. *Cassidulina* cf. *subglobosa* BRADY, ×100. Reg. no. 68013.
Figs. 14, 15. *Bulimina striata* D'ORBIGNY, ×48. Reg. nos. 68014, 68015.
Fig. 16. *Gyroidina komatsui* AOKI, n. sp., ×93. Holotype, Reg. no. 68016.
Fig. 17. *Gyroidina profunda* AOKI, n. sp., ×59. Holotype, Reg. no. 68017.
Fig. 18. *Nonion* cf. *parkerae* UCHIO, ×69. Reg. no. 68018.
Fig. 19. "*Eponides*" *umbonatus* (REUSS), var., ×93. Reg. no. 68019.
Fig. 20. *Robulus pseudorotulatus* ASANO, ×29. Reg. no. 68020.


1a
1b
2a
2b
3
4
5
6
7
8
9
10
11
12b
12a
13
16a
16b
16c
14
15
17a
17b
17c
18a
18b
19a
19b
19c
20

species is characterized by a narrowly rounded periphery, limbate sutures and very coarsely perforate wall, and it resembles *Anomalina umbilicatula* HERON-ALLEN and EARLAND (1932, *Discovery Rep., v. 4*, p. 426, pl. 14, figs. 40-42) from south of the Falkland Islands, and *Nonion padanum* PERCONIG (1952, *VII Convegno Naz. Met. Petr., Sez. 1, Prestampia*, p. 17, pl. 2, figs. 1, 2) from the Italian Mio-Pliocene. The latter two priorly established species have not been examined for comparison, but the present species seems to be nearly identical.

It has already been recorded as "*Nonion nicobarense* CUSHMAN" from Japan, but the Kar Nicobar species has a "rounded" periphery and fewer chambers in the final whorl (CUSHMAN, 1939, *U.S. Geol. Surv., Prof. Pap. 191*, p. 17, pl. 4, fig. 16).

The present species is congeneric with *Nautilus pompilioides* FICHTEL and MOLL, 1798, and may belong to the genus *Melonis* MONTFORT, 1808, emended by VOLOSHINOVA (1958, *Microfauna SSSR, IX*, p. 148) or *Gavelinonion* HOFKER, 1951 (1956, *Skrifter Univ. Zool. Mus. Kobenhaven, XV*, p. 116).

Nonion cf. *parkerae* is common in the Kiyosumi formation and also in the Pliocene of the Boso Peninsula.

Cassidulina cf. *subglobosa* BRADY

Pl. 25, fig. 13.

Cf. *Cassidulina subglobosa* BRADY, 1884, *Rep. Voy. Challenger, Zool., v. 9*, p. 430, pl. 54, fig. 17.

Kiyosumi specimens referable to this cosmopolitan species, have very small-sized tests. The figured hypotype is the largest specimen obtained.

It is frequent in the Kiyosumi formation.

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Boso	房総	Kimitsu	君津
Godai-batake	郷台畑	Kiyosumi	清澄
Fudago	札郷	Kurotaki	黒滝
Katakura	片倉	Nobori	登
Kazusa	上総	Obitsu	小櫃
Kechienji	結縁寺	Sasa	笹

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464. *DIPHYPHYLLUM* FROM ITOSHIRO, FUKUI PREFECTURE, CENTRAL JAPAN*

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福井県石徹白産 *Diphyphyllum*：福井県石徹白付近に発達する古生界の時代論は飛騨山地構造発達史上重要で，小西健二によって研究された。今回 *Diphyphyllum delicutum* MINATO et KATO に近縁と思われる珊瑚を見出したので記載し，時代を考察した。　猪郷久義

KONISHI (1954) worked out the stratigraphy and paleontology of the fossiliferous limestone distributed narrowly in the Itoshiro area, Ono County, Fukui Prefecture, central Japan. According to him, the Paleozoic rocks distributed in this area are surrounded by the so-called "Hida Metamorphic Complex" and are slightly metamorphosed both dynamically and thermally. He subdivided the Paleozoic rocks as follows in descending order;

Shimozaisho alternation of clayslate and limestone ..... 210 m thick.
Shimozaisho Limestone ..... 250 m thick.

KONISHI reported several poorly preserved fusulinids and corals from the upper part of the Shimozaisho Limestone, such as *Eoschubertella* or *Schubertella*, *Fusulina* ? sp. A, *F.* ? sp. B, cfr. *F. lanceolata* (LEE and CHEN), *Caninia* sp. A, sp. nov. ?, *C.* cfr. *mapingense*, *C.* cfr. *simpliseptata* and *C.* ? spp. indet.

Concerning the geological age of this fauna he mentioned (KONISHI, 1954, p. 12) as follows "Through their comparison with the species known from Asia and its adjacence, the writer contends the foraminiferal faunule to be probably Moscovian and the corals are about the same in age or a little younger, but as young as Artinskian".

Although his fusulinids are in very poor state of preservation, his conclusion as to the Moscovian age of them was upheld by the subsequent discoveries of the *Fusulina* Zone in the Hida massif (IGO, 1956). A *Caninia* faunule was also found in the upper part of the *Fusulina* Zone below the *Triticites* Zone in the Ichinotani Formation distributed in the Fukuji district about 60 km northeast of Itoshiro (FUJIMOTO and IGO, 1958; IGO, 1961). Therefore, the geological age of the Shimozaisho Limestone seems to be Moscovian and there is no possibility of it extending upwards into the Permian. As will be described later *Diphyphyllum* cfr. *delicutum* which was newly found from the top of the Shimozaisho Limestone resembles *Diphyphyllum delicutum* MINATO and KATO and is also related to *D. equiseptatum* YABE and HAYASAKA. Both species were discriminated from the Nagaiwa Series of the Kitakami massif. As already pointed out by MINATO (1955) and MINATO and KATO (1957) this type of *Diphyphyllum* is a long ranging type and it persisted from late

* Received June 12, 1963; read at the Meeting of the Palaeontological Society of Japan held in Sendai City, June 1, 1963.

Early Carboniferous to Early Permian. Therefore, the present discovery of *Diphyphyllum* in the Shimozaisho Limestone is not a strong positive suggestion of the Moscovian age, however, the close similarity between this specimen and *D. delicutum* should not be neglected in a discussion on the geologic age of the mentioned limestone.

Description of Fossil

Genus *Diphyphyllum* LONSDALE, 1845

Diphyphyllum sp., cfr. *D. delicutum* MINATO and KATO

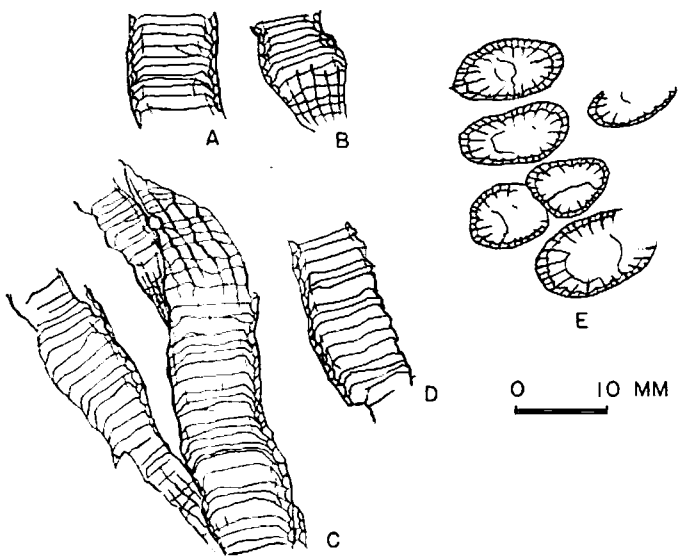
Text-figs. A-E.

cfr. *Diphyphyllum delicutum* MINATO and KATO, 1957, *Trans. Proc. Pal. Soc. Japan, N. S., No. 28*, p. 137, text-figs. A-C.

Corallum fasiculate and phaceloid. Carallites cylindrical and rather closely disposed. Diameter of corallite 7 to 10 mm in full growth. Septa of two orders, rather short and slightly flexuous. Major septa 17 to 19 in number and attain to about one half to one third of corallite radius. Minor septa alternate with major septa, short and less than one half length of major septa. Dissepiments in one row and concentrically arranged.

In longitudinal section tabulae numerous, about 10 in distance of one millimeter. Inner tabulae essentially horizontal, rarely undulating and uniting with not so clearly differentiated inclined outer tabulae. Dissepimentarium narrow, usually in one row and rarely in two rows. No axial structure observed.

Remarks:—The present specimen closely resembles *Diphyphyllum delicutum* MINATO and KATO in corallite size, short septa, septal number and arrangement of tabulae, but *D. delicutum* possesses



Text-figs. A-E. *Diphyphyllum* sp., cfr. *D. delicutum* MINATO and KATO: A, Longitudinal section, slightly modified; B, Longitudinal section, partly tangential; C, Longitudinal section, slightly reproduced; D, Longitudinal section; E, Transverse section.

slightly more numerous tabulae in the corresponding distance. It is also related to *D. equiseptatum* in many respects. *D. equiseptatum* has more numerous septa and slightly larger corallite. Owing to the poor state of preservation, specific determination is reserved.

Occurrence:—KONISHI's locality (a) Valley, Itoshiro, Ono County, Fukui Prefecture. Reg. no. 21714.

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Fukuji 福地
Ichinotani 一ノ谷
Itoshiro 石徹白
Ono County 大野郡
Shimozaisho 下在所

Trans. Proc. Palaeont. Soc. Japan, N. S., No. 53, pp. 173-178, pl. 26, Apr. 10, 1964

465. NOTES ON A CRETACEOUS NAUTILOID FROM KYUSHU*

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九州産の白亜紀おうむ貝類化石：鹿児島県獅子島の白亜系御所浦層群中部層（*Grayosonites* を産した部層のすぐ下位の三角貝の多い砂岩で，おそらく下部セノマニアン）から1個のおうむがい類化石が得られた。これは *Paracymatoceras* 属の新種を代表する。本種は同属の模式種 *P. asper*（欧州のチトニアン産）と同様に，殻の腹面中央に浅いくぼみがある。白亜紀の *Paracymatoceras* の既知種にはこのくぼみがないのに対し注意すべきである。縫合線は波打っており，*Cymatoceras semilobatus*（インド南部の上部アルビアン）や *C. cenomanensis*（欧州のセノマニアン）よりも波が強い。本種が *P. asper* の直系子孫か，やや波打った縫合線をもつ部類の *Cymatoceras* のある種類から，側枝として進化したものかは，とくに下部白亜系産のものを今後探求してよく比較しないと，断定できない。

松本達郎・天野昌久

Introductory Notes

Nautiloids are rather rare in the Cretaceous of Kyushu. YABE and SHIMIZU (1924) described *Cymatoceras pseudoatlas* from the middle part of the Senonian Himenoura Group, Amakusa, western Kyushu. This was represented by a single, well preserved specimen. In the subsequent collection some fragmentary specimens have been added to it from the Himenoura Group, but they are insufficient for accurate identification. In a recent collection from the Albian Yatsushiro Formation, Kumamoto Prefecture, one of us (T. M.) has recognized a small but interesting example of either *Hemiautilus* or *Paracenoceras*, which awaits a full palaeontological description. Whether *Cymatoceras tsukushiense* (KOBAYASHI, 1954) (em. KUMMEL, 1956), from the Tertiary sandstone exposed in the city of Fukuoka, is a relict or a derived fossil is a problem to be settled.

In this paper we describe an interesting specimen of the cymatoceratine nautiloid recently obtained from the middle part (Lower Cenomanian) of the Goshonoura Group of Shishi-jima, Kagoshima Prefecture.

Before entering into the description, short remarks are to be given on the stratigraphic occurrence of the specimen (see Fig. 1).

The stratigraphic sequence of the Goshonoura Group in Shishi-jima has recently been described by one of us (AMANO, 1962, p. 2-9). As in the type area of Goshonoura island (see MATSU-

* Received 7 November 1963; read 10 November 1963 at the 86th Meeting of the Palaeontological Society of Japan.

MOTO, 1960, p. 53), the group is divided into three formations, lower, middle and upper. The middle division in Shishi-jima consists of the following four members in ascending order:

(a) Silty sandstone, about 180 m, with *Nipponitrigonia*.
(b) Conglomerate and coarse-sandstone, about 110 m.
(c) Sandstone, about 150 m, rich in trigonians.
(d) Siltstone, about 220 m, with *Graysonites*.

The nautiloid specimen was obtained from the third member, which consists primarily of fine- to medium-grained sandstones, with intercalated dark grey siltstone in the upper part. The sandstone may be occasionally conglomeratic but the conglomerate does not form a continuous bed. The sandstone is massive in some parts and well bedded in others. This member is rich in mollusca, especially in trigonians. The fossils are well accumulated in some parts to form fossiliferous beds and lenticular bodies

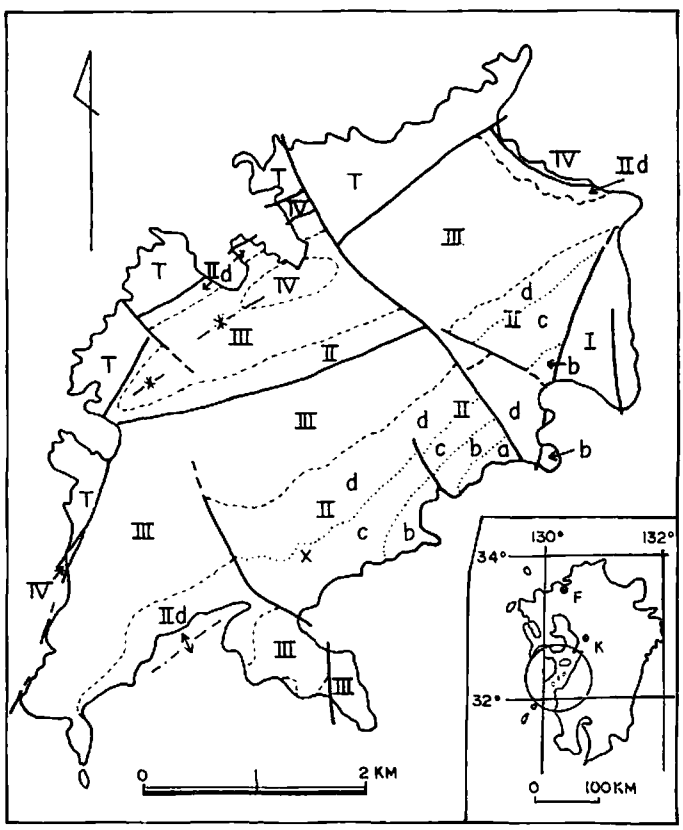

Fig. 1. Geological sketch map of Shishi-jima (adapted from AMANO, 1962). I, II, III: Lower, Middle and Upper Formations of the Goshonoura Group; a-d: Members a-d of the Middle Goshonoura; IV: Himenoura Group (Senonian); T: Lower Tertiary; × : Type locality of *Paracymatoceras tunghaicum*. Inset is a map of Kyushu, indicating the location of Shishi-jima at the center of a small circle and also those of Fukuoka and Kumamoto with F and K.

but may be scattered in other parts. The mode of occurrence of the described nautiloid belongs to the latter category. The fossil was preserved in a massive, grey, fine to medium-grained sandstone which contains *Acanthotrigonia pustulosa* (NAGAO), *A. ogawai* (YEHARA) and *A. dilapsa* (YEHARA). It is fragmentary and in its broken body-chamber small gastropod shells (probably referable to *Turritella*) are embedded.

On the evidence of ammonites, *Gray-sonites* sp. cf. *G. fountaini* YOUNG, *Gray-sonites* spp. indet. α and β (see MATSUMOTO, 1960), the fourth member is undoubtedly assigned to the Lower Cenomanian. We (AMANO et al. *in* MATSUMOTO, 1960) have, furthermore, concluded that the Middle Formation of the Goshonoura Group is wholly referable to the Lower Cenomanian on the grounds of the stratigraphic relation and the contained fossils. Therefore the Sandstone Member (c), in which the described nautiloid was found, is regarded as a lower part of the Lower Cenomanian.

The described specimen is now preserved in the Type-specimen Room of the Department of Geology, Kyushu University, Fukuoka, with register number, GK. H6401.

Systematic Description

Family Nautilidae D'ORBIGNY, 1840

Subfamily Cymatoceratinae SPATH, 1927

Genus *Paracymatoceras* SPATH, 1927

Type-species:—*Nautilus asper* (OPPEL) ZITTEL, 1868.

Remarks:—This genus, established by SPATH (1927, p. 21), has received good comments by MILLER and HARRIS (1945, p. 9) and also by KUMMEL (1956, p. 427).

Paracymatoceras tunghaicum sp. nov.

Pl. 26, figs. 1a–b; text-figs. 2, 3

Holotype:—GK. H6401, an incompletely preserved body-chamber and the last portion of a phragmocone, in which the test is partly preserved.

Description:—The conch is involute and the umbilicus is closed. The body chamber is subquadrate in section, slightly broader than high. The measurements show 61 mm in height and 68 mm in breadth of the whorl, but the specimen is slightly deformed. The venter is broad with a shallow median groove. The flank is gently inflated and abruptly bent at the umbilical shoulder to form a nearly vertical umbilical wall. The maximum breadth is somewhat below the mid-height.

Fig. 2. *Paracymatoceras tunghaicum* sp. nov. Holotype, GK. H6401, natural cross section of the body-chamber. ×1.

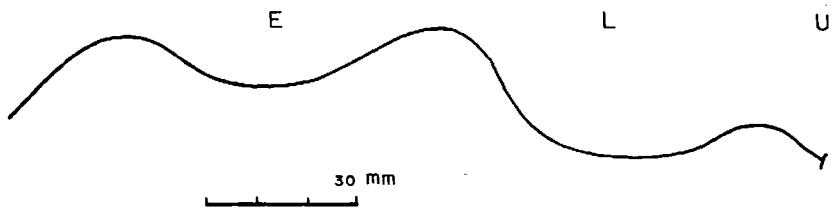

Fig. 3. *Paracymatoceras tunghaicum* sp. nov. External suture of the holotype, GK. H6401.

The ribbing is of cymatoceroid type, consisting of numerous low ribs which run almost radially, with slight flexuosity, on the flank, curved backward on the ventrolateral part and cross the venter with a strong backward sinus, forming chevrons. On the internal mould the ribs are impressed on the venter but the impression is very weak on the flank. The ribs are close-set, being separated by somewhat narrower interspaces.

The suture is sinuous, consisting of a broad and low ventral lobe, considerably high, asymmetric, ventrolateral saddle, a broad and moderately deep lateral lobe, a small saddle close to the umbilicus and a shallow and small umbilical lobe. The internal suture is not clearly exposed. The siphuncle crosses the septum at a point somewhat dorsad from the center.

Remarks:—Although a single, imperfectly preserved specimen is at our disposal, the observed characters are so distinctive that the establishment of a new species is justifiable as discussed below.

Comparison:—In the sinuous suture, subquadrate whorl section with a ventral groove and cymatoceroid ribbing this species is generally allied to *Paracymatoceras asper* (OPPEL) (ZITTEL, 1868, p. 48, pl. 3, fig. 1; MILLER and HARRIS, 1945, p. 9, pl. figs. 1-3; KUMMEL, 1956, p. 427, text-fig. 23G, pl. 19, figs. 1, 2), the type-species of *Paracymatoceras* SPATH, 1927. Accordingly it is to be referred to the genus *Paracymatoceras*.

Besides the type-species, which occurs in the Tithonian of Europe, five distinct species and a few indeterminable species of *Paracymatoceras* have been known from the Cretaceous of various areas in the world (see KUMMEL, 1953, 1956). No ventral groove is observed on all these hitherto known Cretaceous species, from which the present species is distinguished. MILLER and HARRIS (1945) suggested that those without ventral groove might be separated from the group of *P. asper*, but KUMMEL (1956) holds that the genus *Paracymatoceras* is variable in this respect. Anyhow it is interesting to note that the present species represents a Cretaceous example of the group of *P. asper* with a ventral groove.

The suture of the present species is not quite identical with that of *P. asper*. In the latter species there is no ventral lobe and the dorsolateral saddle is larger and more distant from the umbilicus than in the present species.

Among the Cretaceous species, *Paracymatoceras texanum* (SHUMARD) (1860, p. 50), from the Washita Group of Texas, as described by MILLER and HARRIS (1945, p. 10, pl. 3, figs. 1, 2; pl. 5, figs. 1-3; text-fig. 3) has deeper lateral lobe than the present species and no ventral lobe. It has a much more compressed

conch than the present species.

As KUMMEL (1956) has pointed out, certain species of *Cymatoceras* HYATT, 1884, have fairly sinuous sutures, being trasitional to *Paracymatoceras*. Thus, *Cymatoceras semilobatus* (SPENGLER) (1910, p. 133 [9], pl. 26 [11], fig. 4a, b), from the Lower Ootatoor Group of India, has a lateral lobe which is similar in outline to that of the present species, but has no ventral lobe and probably no dorsolateral saddle. *Cymatoceras cenomanensis* (SCHLÜTER) (1876, p. 168, pl. 45, figs. 1, 2), from the Cenomanian of Europe, has a lateral lobe and a small dorsolateral lobe, which are similar to those of the present species, but has no ventral lobe. Its conch is broader and has finer ribs than ours. *Cymatoceras virgatum* (SPENGLER) (1910, p. 131, [7], pl. 26 [11], fig. 3a, b; pl. 27 [12], fig. 7c), from the Lower Ootatoor Group (Upper Albian) of India, has a ventral lobe as shallow as that of the present species but its ventrolateral saddle seems to be lower than that of the latter. It has much broader whorl than ours and peculiar, diverging ribs.

Occurrence:—Hirokino-tani, Kashiwaguri, in the southern coastal area of Shishi-jima, Kagoshima Prefecture: approximately 130°14′18″ East Long., 32° 15′52″ North Lat.; in *Acanthotrigonia* bearing Sandstone Member (the third member in ascending order) of the Middle Formation of the Goshonoura Group. The specimen was collected by M. AMANO.

Concluding Remarks

A nautiloid recently obtained from the middle part of the Goshonoura Group, probably Lower Cenomanian, of Shishi-jima, off the southwest coast of Kyushu, represents a new species of *Paracymatoceras*, named *P. tunghaicum*. It has a shallow groove along the mid-ventral line like *P. asper* (OPPEL), the type-species, from the Tithonian of Europe, being dissimilar in this respect to other known Cretaceous species of *Paracymatoceras*. In suture it is similar to and somewhat more sinuous than such species as *Cymatoceras semilobatus* (SPENGLER), from the Upper Albian of southern India. Whether *Paracymatoceras tunghaicum* n. sp. is a direct descendant of *P. asper* or is an offshoot from *Cymatoceras* by way of a species with sinuous sutures may be a question to be solved by further discovery of various examples, especially from the Lower Cretaceous sequence.*

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Goshonoura 御所浦
Hirokino-tani 広木の谷
Kashiwaguri 柏栗
Shishi-jima 獅子島

Explanation of Plate 26

Fig. 1a-d. *Paracymatoceras tunghaicum* sp. nov.
Holotype, GK. H6401, from a sandstone at Hirokino-tani, Kashiwaguri, southern coast of Shishi-jima, Kagoshima Prefecture. Sandstone Member, with *Acanthotrigonia*, of Middle Formation of the Goshonoura Group. Two lateral (a, b), ventral (c) and frontal (d) views. In Fig. 1d the whorl section is not in a right position (cf. Text-fig. 2), while the siphuncle is shown at the bottom. Figures are all of natural size.

1a

1c

1b

1d

Trans. Proc. Palaeont. Soc. Japan, N.S., No. 53, pp. 179-193, pls. 27, 28, Apr. 10, 1964

466. CARBONIFEROUS CONODONTS FROM THE OMI LIMESTONE, NIIGATA PREFECTURE, CENTRAL JAPAN

(STUDIES OF ASIAN CONODONTS, PART I)*

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青海石灰岩から発見された石炭紀のコノドントについて：新潟県西頸城郡青海町，青海電化株式会社の青海川沿いの西山採石場に露出する C_1 層 (*Millerella* Zone) の石灰岩から発見されたコノドントのうち，11属16種を記載した。またこれらのコノドントにもとづいて，C_1 層の地質時代を検討した。

猪郷久義・小池敏夫

Introduction and Acknowlegments

The Omi Limestone is distributed in Nishikubiki County, Niigata Prefecture, Central Japan. It has been studied by many workers, such as HAYASAKA (1924), KAWADA (1954) and FUJITA (1958), but no comprehensive paleontological study has been published except for HAYASAKA's classical work. We have been studying various fossils from this huge limestone mass and are very fortunate to find an excellently preserved rich conodont fauna in the lower part of this limestone. There has been no report of a rich conodont fauna in Japan except for recent brief note of HAYASHI (1963). We studied this newly found conodont fauna with keen interest. As the result of the study we discriminated eleven genera and sixteen species and became to believe that this conodont fauna apparently indicates Early Pennsylvanian or Late Namurian in age. This conclusion must be noted about the geological age of the lower part of the Omi Limestone which was rather vague before our study. This paper is the first report of our continuous work on conodonts from Japan and other Asian districts.

Acknowledgments are due to Drs. Haruyoshi FUJIMOTO, professor emeritus of the Tokyo University of Education, Wataru HASHIMOTO, professor of the same university, Teiichi KOBAYASHI, professor emeritus of the University of Tokyo and Teturo HANAI, assistant professor of the same university, for their suggestions and encouragements. During the senior author's stay in Illinois he was indebted to Dr. Charles COLLINSON, geologist of the Illinois State Geological Survey, for his guidance for the conodont study. We also thank Mr. Hidetoshi TOGASHI of the Omi Denka Co. Ltd., for his help to our fossil collection in the field. A part of expenses of this work was defrayed from the Scientific Expenditure Fund, Ministry of Education, Japanese Government.

Stratigraphic Summary

The Omi Limestone is a thick limestone mass ranging from the Early Car-

* Received Jan. 6, 1964; read at the Annual Meeting of the Society at Tokyo, Sep. 7, 1963.

boniferous (Tournaisian) to late Middle Permian in age. According to KAWADA (1954) and FUJITA (1958) this limestone can be subdivided into five lithogenetic units as follows in descending order.

P_2.....*Parafusulina* and *Neoschwagerina* Zones
P_1.....*Pseudofusulina* and *Pseudoschwagerina* Zones
C_3.....*Triticites* Zone
C_2.....*Fusulinella-Fusulina* Zone
C_1.....*Millerella*—Coral-Brachiopod Zone

The representing conodonts were collected from C_1 of KAWADA and FUJITA. The geological age of C_1 was very obscure, but HAYASAKA once discriminated the following fossils, such as *Amygdalophyllum giganteum* (HAYASAKA), *Corwenia ? omiensis* (HAYASAKA), *Axophyllum gracile* HAYASAKA, *Lithostrotion somaense* YABE and HAYASAKA, *Stylidophyllum* sp., *Chaetetes* sp., *Gigantoproductus edelburgensis* (PHILLIPS), *Avonia* cfr. *aculeatus* (MARTIN), *Echinoconchus punctatus* var., *Productus semireticulatus* MARTIN, *Camarophoria globulina* PHILLIPS, *Martinia glabra decora* PHILLIPS, *Reticularia lineata* MARTIN, *Syringothyris cuspidatus* MARTIN, *Megistocrinus* sp., *Actinocrinus* aff. *globrus* PHILLIPS and others.

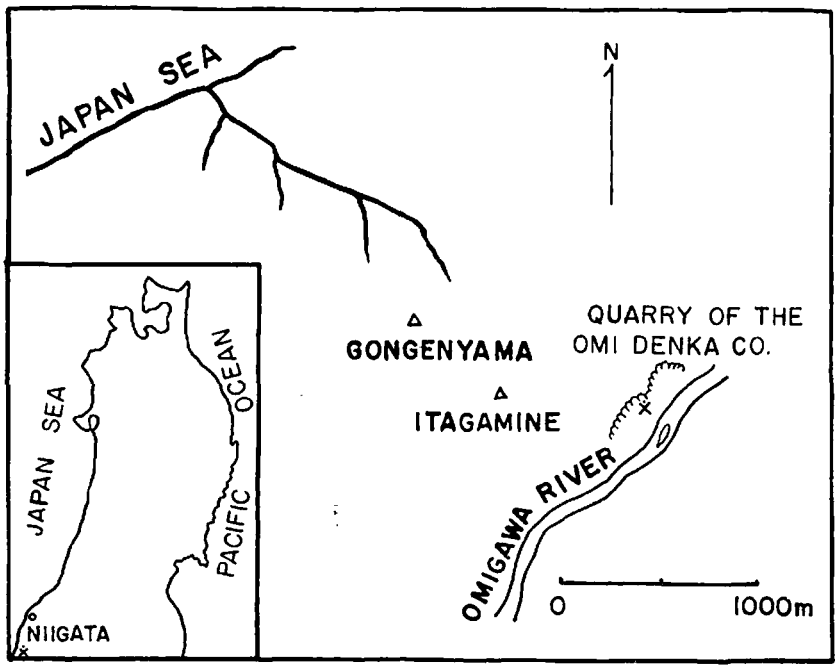
Unfortunately precise stratigraphic positions of these fossils are still obscure. It seems to be necessary further investigation of these fossils from C_1 based upon the present progressed paleontology. The occurrence of *Syringothyris cuspidatus* from C_1 indicates Tournaisian age, and *Gigantoproductus* and others are thought to be the Visean. Recently SAKAGAMI (1962) proved the occurrence of *Profusulinella* from the upper part of C_1 and described several Carboniferous bryozoa. KATO and NAKAMURA (1962) reported the occurrence of *Eoasianites* from the certain horizon of C_1 and they briefly discussed about the geological age of C_1. Judging from these evidence, KAWADA's Coral-Brachiopod Zone or FUJITA's *Millerella*-Coral-Brachiopod Zone is thought to be equivalent to the Tournaisian to Bashikirian.

We collected many specimens of brachiopods, ammonites, corals and others from about 100 m. below of the SAKAGAMI's *Profusulinella*-limestone. They are not throughly worked out, but we discriminated the following ammonites in addition to *Eoasianites* sp., such as *Gastrioceras* sp., aff. *G. reticulatus* Yin and *Paralegoceras* sp.. These ammonites may indicate the *Reticuloceras* Zone of western Europe. The *Reticuloceras* Zone is the Upper Namurian and thought to be equivalent to the Lower Pennsylvanian (MOORE, 1948; ELIAS, 1956). Our conodont fauna was obtained from this ammonite-bearing limestone, and as will be discussed later the geological age of this conodont fauna also indicates exactly same age with the preliminary conclusion from these ammonites and brachiopods.

Faunal Summary of Conodonts

The collections were made in the Nishiyama quarry of the Omi Denka Co. Ltd. along the Omigawa River (Text-fig. 1). Stratigraphic position of conodont-bearing bed is about 100 m. below of the SAKAGAMI's *Profusulinella*-limestone.

We have succeeded to separate numerous specimens of conodonts from gray to white sparry limestone by acetic acid treatment and discriminated the following species, namely:—*Hindeodella asiatica* IGO and KOIKE, n. sp., *H. paradelicatula* IGO and KOIKE, n. sp. *H. sakagamii* IGO and KOIKE, n. sp., *Synprionio-*



Text-fig. 1. Map showing the fossil locality.

dina microdenta ELLISON, *S. collinsoni* IGO and KOIKE, n. sp., *Euprioniodina dentata* IGO and KOIKE, n. sp., *Ligonodina hanaii* IGO and KOIKE, n. sp., *Roundya subacordus* (GUNNELL), *Lonchodina* ? *nipponica* IGO and KOIKE, n. sp., *Ozarkodina orientale* IGO and KOIKE, n. sp., *Spathognathodus echigoensis* IGO and KOIKE, n. sp., *Idiognathodus togashii* IGO and KOIKE, n. sp., *Streptognathodus japonicus* IGO and KOIKE, n. sp., *S. expansus* IGO and KOIKE, n. sp., *Gnathodus opimus* IGO and KOIKE, n. sp. and *Gnathodus* sp.

Hindeodella asiatica and *H. sakagamii* resemble *H. armata* STAUFFER and PLUMMER which was described from the East Mountain Shale member, Mineral Wells formation, Texas. *H. paradelicatula* is also closely related with *H. delicatula* STAUFFER and PLUMMER from the Graford and Mineral Wells formation in Texas. These three new species of *Hindeodella* are very abundant throughout the collections, and they are related to the mentioned American species which range from the Desmoinesian to Missourian. Owing to the fragmentary state of these described foreign specimens, detailed comparison seems to be difficult. Thus we proposed new species herein based upon many complete specimens.

The genus *Synprioniodina* is known from the Lower Devonian to Upper Carboniferous, but it is rather common in the Devonian and Mississippian rocks. *S. microdenta* is very abundant in the treated material and it is similar to the American specimens which were described from the Cherokee Shale through the Deer Creek Limestone (ELLISON, 1941) and also from the Middle Dimple formation (Morrowan) in Texas (ELLISON and GRAVES, 1941). ROHDES (1952) described *Synprioniodina*-assemblage from

the Pennsylvanian of Illinois and his illustrated specimens quite agree with our specimens. *S. collinsoni* is rather rare, but having unique denticles and is very distinct from other previously described species.

Euprioniodina dentata is not so common in our collections. The genus *Euprioniodina* is rather long-ranged conodont and has been known from the Lower Carboniferous to Triassic. Our new species resembles *E. pulcella* YOUNGQUIST and DOWNS described from the Lower Pennsylvanian of Iowa.

Ligonodina is also a long-ranged genus of Coleodontidae and has been reported from the Ordovician up to the Triassic rocks. *L. hanaii* is a rare species in our collection and it may be related with *L. typa* (GUNNELL) and also with *L. lexingtonensis* (GUNNELL) reported from the Desmoinesian and Missourian of North America.

Roundya subacodus (GUNNELL) is also a rare species in this fauna. Detailed comparison between our forms and the American ones seems to be difficult, but they stand very close each other. According to ELLISON (1941), *R. subacodus* ranges from the Desmoinesian through Virgilian.

Lonchodina ? *nipponica* is also a rare representative of this fauna. It resembles *L.* ? *ponderosa* ELLISON in many respects, if not entirely conspecific. ELLISON's species ranges from the Desmoinesian to the Lower Permian in Missouri and Kansas.

Ozarkodina orientale is a common species in our fauna and is related to *O. delicatula* described by many workers from the Kinkaid to various levels of the Pennsylvanian in U. S. A. The Mississippian species of *O. compressa* REXROAD described from Illinois is similar to our *O. orientale*.

Spathognathodus echigoensis is a rather common species in this fauna and it slightly resembles *S. minutus* (ELLISON) discriminated from the Desmoinesian to Big Blue Series.

Idiognathodus togashii is a rather rare throughout our collection. This new species seems to be a primitive type among this genus and resembles *I. delicatus* GUNNELL persisting in the Desmoinesian to Lower Virgilian in Kansas and Missouri.

Two forms of *Streptognathodus* are discriminated from this fauna. *S. japonicus* is very abundant and is a characteristic representative in this fauna, but it differs from many American species. *S. expansus* is rare, but it resembles *S. wabaunsensis* GUNNELL and other Pennsylvanian species of U. S. A..

Gnathodus opimus is fairly common in our collection, but it differs from most of the American and European species.

As mentioned above the Omi conodont fauna is dominated by *Streptognathodus japonicus*, *Gnathodus opimus*, three new species of *Hindeodella*, *Synprioniodina microdenta*, *Spathognathodus echigoensis* and *Ozarkodina orientale*.

Up to date a few papers treated the Lower Pennsylvanian or Upper Namurian conodonts were published, therefore, it renders difficult to compare our fauna with those from foreign countries. The Omi fauna is characterized by entire lack of the typical Mississippian genera, such as *Dollymae*, *Doliognathus*, *Scaliognathus*, *Staurognathus*, *Taphrognathus*, and others. It is also never overlooked that the characteristic Middle Pennsylvanian to Upper Triassic genus of *Gondolella* is avoided in the fauna. From the above mentioned evidences the present Omi conodont fauna apparently indicates Early Pennsylvanian or Late Namurian in age, and it is thought to

be one of the richest conodont faunas of the mentioned age in the world.

Description of Species

Family Coleodontidae BRANSON and MEHL, 1944

Subfamily Hindeodellinae HASS, 1959

Genus *Hindeodella* BASSLER, 1925

Hindeodella asiatica IGO and KOIKE, n. sp.

Pl. 27, figs. 7-10

Bar-like unit with anterior bar flexed inward as well as downward approximately 90 degrees, anterior end further curved toward posterior, and hook-like in shape. Posterior bar almost straight, elliptical in transverse section, but flattened except for blade-like near posterior end. Aboral side of bar sharply edged except adjacent to small pulp cavity and distinctly grooved along midline.

Denticles of posterior bar two sizes, very closely set and directed posteriorly and angled about 70 degrees with bar. Large denticles sharply pointed and slightly curved inward. Smaller denticles needle-like, variable in size and shape, six to ten between adjacent larger denticles. Denticles near posterior end differ from those of most part of posterior bar, strongly angled posteriorly and make an angle of 40 degrees with bar. One or two slightly smaller denticles developed between adjacent larger ones. Main cusp biconvex, larger than any other denticles, arched posteriorly, and curved inward.

Anterior bar angled downward just anterior to main cusp with abrupt inward flexure at about one-third length of anterior bar from main cusp. Denticles of anterior bar erect, discrete, larger than small sized denticles of posterior bar, and anteriorly increase in size.

Pulp cavity small with faint elevation of lips.

Remarks:—*Hindeodella asiatica* closely resembles *H. armata* STAUFFER and PLUMMER described from the Pennsylvanian Mineral Wells formation in Texas, but our species is having more numerous small denticles of the posterior bar and well developed denticles of the anterior bar. *H. fragilis* HASS described from the Early Mississippian Chappel Limestone in Texas is also similar species with our *H. asiatica*, but the present species is easily distinguishable in more numerous small sized denticles of the posterior bar and more distinctly discrete larger denticles of the anterior bar. *H. bella* STAUFFER and PLUMMER was based upon the fragmentary posterior end. The posterior end of *H. asiatica* is almost difficult to distinguish from *H. bella*.

Reg. no. 23002 (Holotype)

Hindeodella paradelicatula IGO and KOIKE, n. sp.

Pl. 27, figs. 3-6

Bar slender, flexuous, very thin, and flattened in transverse section. Aboral side sharply edged, but very fine shallow groove developed except adjacent to oval and small pulp cavity. Posterior end of bar very thin, blade-like, and not grooved. Anterior bar bends inward slightly and its angle about 120 degrees with bar.

Denticles of posterior bar with sharply pointed end, two sizes of larger and smaller which bend posteriorly and make an angle of about 50 to 70 degrees with bar. Large denticles deeply penetrated into bar and markedly bend toward an-

terior. Smaller denticles about a half length of larger ones and counted five to seven between adjacent larger ones. Denticles of posterior end make a small angle with bar and alternate with larger and smaller. Denticles of anterior bar coalesced or discrete, seven or eight in total number, and subequal in size and shape with larger denticles of posterior bar, but two or three minute ones developed near main cusp. Main cusp largest in size, sharply pointed, and biconvex. Pulp cavity oval, small, and surrounded by slightly elevated lips.

Remarks:—*Hindeodella paradelicatula* proposed herein is based upon complete specimens and it resembles closely *H. delicatula* STAUFFER and PLUMMER described from the Graford formation in Texas. General feature of the bar and the arrangement of the denticles are almost same each other except for more flattened bar of our species. Owing to the fragmentary Texan species, detailed comparison between both species seems to be difficult.

Hindeodella sakagamii IGO and KOIKE, n. sp.

Pl. 27, figs. 1, 2

Bar consisting of slender and almost straight posterior bar, and curved anterior bar. Posterior bar thin, flattened, and finely grooved along sharply edged aboral side. Anterior bar thinner than posterior bar, blade-like, and angled inward as well as downward. Inward curvature with larger angle than downward and makes an angle of about right angle. Position of curvature located about middle of anterior bar.

Denticles of posterior bar consisting of larger and smaller ones. Larger denticles biconvex, sharply pointed, directed posteriorly, making an angle of 80 degrees in anterior part of bar, while about 30 to 40 degrees in posterior half. They deeply penetrated into bar and strongly bend anteriorly. Denticles of anterior bar two types in size, and almost same with those of posterior bar except fewer numbers of smaller denticles. Main cusp slightly larger than denticles of posterior bar and directed posteriorly with slightly larger angle than those of other denticles of posterior bar. Pulp cavity located just beneath main cusp, small, narrow, and with faint elevation of lips.

Remarks:—*Hindeodella sakagamii* resembles closely *H. asiatica* in mode of inward curvature, but the present species has a slight downward curvature of the anterior bar, flat and thin both posterior and anterior bars with almost similar denticles.

Reg. no, 23007 (Holotype).

Subfamily Ligonodininae HASS, 1959

Genus *Synprioniodina* ULRICH and BASSLER, 1926

Synprioniodina microdenta ELLISON

Pl. 27, figs. 11-17

Synprioniodina sp. GUNNELL, 1933, *Jour. Pal., vol. 7*, p. 269, pl. 31, fig. 6.

Synprioniodina microdenta ELLISON, 1941, *Ibid., vol. 15*, p. 119, pl. 20, figs. 43-46; ELLISON and GRAVES, 1941, *Missouri Univ., Sch. Min. Met., Bull., Tech. Ser., vol. 14*, p. 3, 4, pl. 1, fig. 10.

Two bars meet at forming of an angle of about 40 degrees in common plane. Posterior bar slender, very long, gently arched, having sharply edged aboral side.

Denticles subequal, sharply pointed, coalesced, and angled anteriorly to base of bar at an angle of about 45 degrees.

Large denticles about twice larger than smaller ones and alternate in most part of posterior bar. Anticusp short, with triangular small denticles coalesced at based and inclined anteriorly about an angle of 30 degrees with base of bar.

Main cusp at an apex of bifurcation of bars, sharply pointed, curved inward, about twice as long as other denticles and three times or more near base as wide as other ones, and expanded at base on inward side into wide flaring lip of pulp cavity, while outer side lip depressed inward.

Aboral side of both bars traversed by fine groove terminated in a deep conical pulp cavity just below main cusp.

Remarks:—Our material is similar to ELLISON's specimens described from Missouri and Texas in many respects. The inclination of the denticles of both bars and week expansion of lip of pulp cavity of the Japanese specimens slightly differ from those of the American specimens.

Reg. no. 23015

Synprioniodina collinsoni IGO and KOIKE, n. sp.

Pl. 27, figs. 18, 19

The blade-like bar meet at about right angle. Posterior blade thin with sharp-edged aboral side.

Denticles of posterior bar small, biconvex, coalesced near base and laterally compressed, erect in anterior part and slightly curved posterior end.

Anticusp blade-like, with various sized biconvex laterally compressed coalesced denticles, and curved anteriorly. Main cusp large, biconvex, sharply pointed with broad base, sharply curved posteriorly, and slightly elevated ridge along midline of posterior side, but shallow groove developed in anterior side.

Aboral side of both blades traversed by distinct groove terminated in deep conical pulp cavity beneath main cusp. Pulp cavity with moderately elevated triangular lips.

Remarks:—The present new species differs from the previously described species in blade-like bars, shape of main cusp and denticles of the posterior bar and anticusp.

Reg. no. 23028 (Holotype).

Genus *Euprioniodina* ULRICH and BASSLER, 1926

Euprioniodina dentata IGO and KOIKE, n. sp.

Pl. 28, fig. 23

Bar-like units meet at forming of right angle. Posterior bar thin with sharply edged aboral side and pointed denticles.

Denticles of posterior bar slightly convex inward, strongly arched toward anterior, forming an angle of about 50 to 60 degrees, which subequal in shape and size, laterally compressed, and biconvex with pointed end and broad base.

Anticusp short, having small triangular denticles coalesced at base, and arched anteriorly about at right angle with base of anticusp. Main cusp at apex of bifurcation of two blades, large, sharply pointed, curved outward with elevated keel along midline on inner side, and expanded at base on inward side into flaring lip of pulp cavity, but on outer side slightly concave.

Aboral side of posterior bar and anticusp grooved, and its opening terminated in a deep pulp cavity of inward side of main cusp, extending to anticusp.

Remarks:—This species resembles *Euprioniodina pulcella* YOUNGQUIST and DOWNS described from the Early Pennsyl-

vanian shale of Knoxville, Iowa, but the denticles of posterior bar of the former are more anteriorly arched and having broad base.

Reg. no. 23026 (Holotype).

Genus *Ligonodina* BASSLER, 1925

Ligonodina hanaii IGO and KOIKE, n. sp.

Pl. 28, figs. 21, 22

Bar-like units meet at large angle. Anticusp curved inward as well as downward, with two separated denticles so far as observable. Posterior bar thin, with sharply edged aboral and oral sides, and with one denticle so far as preserved. Aboral side of bar finely grooved.

Denticles of anticusp sharply pointed, curved inward, and circular in cross section. Denticles of posterior bar laterally compreseed, and biconvex with sharp pointed tips. Main cusp very long, rather flexible, arched posteriorly, having sharply pointed tip. Basal part of main cusp subtriangular in cross section, but circular in most part. Pulp cavity large and subrhombic at aboral opening, deep, and merges into main cusp.

Remarks:—*Ligonodina hanaii* resembles closely *L. typa* (GUNNELL) than any previously known species, but our form has widely spaced denticles of anticusp and may have larger pulp cavity.

Reg. no. 23038 (Holotype).

Subfamily Hibbardellinae MÜLLER, 1956

Genus *Roundya* HASS, 1953

Roundya subacodus (GUNNELL)

Pl. 28, fig. 20

Prioniodus subacodus GUNNELL, 1931, *Jour. Pal., vol. 5*, p. 246, pl. 29, fig. 9.

Prioniodus missouriensis GUNNELL, 1931, *Ibid.*, p. 246, pl. 29, fig. 9.

Idioprioniodus striatus GUNNELL, 1933, *Ibid., vol. 7*, p. 265, pl. 32, figs. 36, 37.

Hibbardella subacoda ELLISON, 1941, *Ibid., vol. 15*, p. 118, pl. 20, figs. 22, 26.

Main cusp large, long, sharply pointed, and slightly curved posteriorly and laterally with sharpest curvature near two-thirds length from pointed end. Sharp-edged lateral ridges developed in main cusp and continus downward along each limb of anterior arch. Posterior side of main cusp grooved slightly adjacent to each of lateral ridges, but anterior side convex.

Denticles of anterior arch well developed, discrete, sharply pointed and edged, biconvex, and arched anteriorly and also inward slightly. Length of posterior bar unknown. Denticles of posterior bar subequal with those of anterior arch but smaller and erect.

Aboral side of main cusp excavated and subangular. Posterior bar distinctly grooved. Pulp cavity beneath main cusp, deep and conical.

Remarks:—The American specimens described by GUNNELL (1933) and ELLISON (1941) are having slightly different curvature of the main cusp compared with those of our specimens, but they are fragmental and further detailed comparison renders difficult. The Mississippian species of *Roundya barnettana* HASS is having more distinctly discrete denticles.

Reg. no. 23027.

Subfamily Lonchodininae HASS, 1959

Genus *Lonchodina* BASSLER, 1925

Lonchodina ? nipponica IGO and KOIKE, n. sp.

Pl. 27, fig. 20

Anterior bar longer than posterior bar, stought, subtriangular in cross section. Denticles of anterior bar three, stought, discrete, rather widely spaced with obtuse tip, and almost straight to slightly curved posteriorly. Main cusp largest and rounded in cross section. Posterior bar short with two small discrete denticles erected or slightly curved posteriorly. Aboral side of bar broadly grooved, its opening continued from pulp cavity. Pulp cavity large and shallow beneath main cusp.

Remarks:—This new species resembles *Lonchodina* ? *ponderosa* ELLISON, but it differs in short anterior and posterior bars, and development of the denticles. Short bar, fewer numbers of denticles, large pulp cavity, and broadly grooved aboral side of the bar differ from the typical *Lonchodina*. Generic position of this new species is tentative.

Reg. no. 23037 (Holotype).

Family Prioniodontidae BASSLER, 1925

Subfamily Prioniodontinae BASSLER, 1925

Genus *Ozarkodina* BRANSON and MEHL, 1933

Ozarkodina orientale IGO and KOIKE, n. sp.

Pl. 27, figs. 21-23

Bar blade-like, thin, orally arched, and laterally slightly curved. Blade thickest near base of denticles. Anterior blade longer than posterior one. Anterior blade with six to seven laterally compressed subequal closely set denticles, directed posteriorly in most part, inclined at an angle of 20 to 30 degrees with base of blade.

Denticles of posterior blade seven, laterally compressed somewhat smaller than those of anterior blade, closely set, partly coalesced, making almost right angle with base of blade. Apical denticles laterally compressed, sharp-edged, pointed, almost twice in width and length of other denticles, and arched making an equal angle with those of denticles of anterior blade.

Aboral side of blade sharply edged. Pulp cavity long, extended into both blades, narrow, deep, and with a moderately elevated flaring lip tapered into base of apical denticle.

Remarks:—*Ozarkodina orientale* resembles more closely *O. delicatula* described by STAUFFER and PLUMMER (1932), GUNNELL (1933), ELLISON (1941) and others than any other described Pennsylvanian species. It differs from *O. delicatula* in more discrete denticles of the anterior blade and fewer numbers of the denticles in both blades. It also resembles *O. compressa* REXROAD described from the Kinkaid of Illinois, but REXROAD's species has more distinct and larger main cusp than that of *O. orientale*.

Reg. no. 23012 (Holotype).

Subfamily Spathognathodontinae HASS, 1959

Genus *Spathognathodus* BRANSON and MEHL, 1941

Spathognathodus echigoensis IGO and KOIKE, n. sp.

Pl. 28, figs. 24, 25

Blade thin, laterally straight, slightly arched with nearly straight aboral side of anterior half.

Denticles subequal in size and shape,

but become smaller toward both anteriorly and posteriorly, coalesced deeply with sharply pointed tip and grooved between adjacent denticles, and angled posteriorly. The first two anterior denticles erect and very thin.

Aboral side of blade sharply edged, grooved along midline except pulp cavity. Pulp cavity large, deep, with expanded lip which continues to almost posterior end of blade, and traversed by longitudinal groove extending from blade.

Remarks:—*Spathognathodus echigoensis* resembles closely *S. minutus* (ELLISON), but it differs from the American species in almost straight aboral side of blade and subequal size of the denticles, and larger pulp cavity.

Reg. no. 23036 (Holotype).

Family Idiognathodontidae HARRIS, and HOLLINGSWORTH, 1933

Subfamily Idiognathodontinae HARRIS and HOLLINGSWORTH, 1933

Genus *Idiognathodus* GUNNELL, 1931

Idiognathodus togashii IGO and KOIKE, n. sp.

Pl. 28, figs. 1-4

Plate lanceolate, pointed anteriorly as well and posteriorly, widest near middle, and steeply sided. Cup small and asymmetrical, outer side slightly larger than inner side. Axis almost straight, but feebly curved inward. Oral surface of platform ornamented with parallel transverse ridges consisting of coalesced nodes at about two-thirds anterior part of plate. Posterior part of platform split by blade and also ornamented with longitudinal ridges consisting of coalesced nodes. Trough shallow, and restricted posteriorly, two-thirds or less length of plate.

Blade shorter than plate so far as examined specimens. Denticles of blade rather large compared with size of blade. Aboral side of blade grooved along midline and its opening continued into expanded pulp cavity. Aboral side of pulp cavity entirely smooth.

Remarks:—This new species resembles *Idiognathodus delicatus* GUNNELL, but it can be distinguished easily from the latter by the longitudinal ridge ornamentation of the posterior part of platform.

Reg. no. 23034 (Holotype).

Genus *Streptognathodus* STAUFFER and PLUMMER, 1932

Streptognathodus japonicus IGO and KOIKE, n. sp.

Pl. 28, figs. 5-13

Cup asymmetrical, pointed anteriorly, widest near middle, outer side always larger than inner side. Platform lanceolate and transverse section of oral surface deeply concave. Oral surface of platform ornamented with two or more node-like parallel longitudinal ridges, narrow and obsolescent toward anterior end. Median trough rather shallow, deepest near widest part of cup, slightly curved inward posteriorly.

Blade subequl in length to plate, very thin in posterior end, thickest just beneath denticulated oral side. Denticles of blade ten or more in mature specimen, almost a half height of blade, but coalesced each other at about two-thirds from base. Denticles chevron-like in lateral view, largest near posterior end, gradually decreasing in size toward plate and continued anteriorly as carina. Carina short and one-fifth or less of

length of plate, and merged into longitudinal ridge of outer side.

Aboral side of blade finely grooved along midline. Aboral side of expanded pulp cavity entirely smooth, but rather deeply grooved along midline.

Remarks:—The present new species has rather broad variation in size, shape of plate, and oral side ornamentation of platform. It resembles closely *S. sulcoplicatus* YOUNGQUIST, HAWLEY and MILLER described from the Permian of Idaho, but this Japanese form has more irregular parallel ridges on platform. It also slightly resembles *S. elegantula* STAUFFER and PLUMMER, *S. gracilis* STAUFFER and PLUMMER, but it is easily distinguishable therefrom by the oral ornamentation of platform and short carina.

Reg. no. 23032 (Holotype).

Streptognathodus expansus IGO and KOIKE, n. sp.

Pl. 28, fig. 14

Cup large, highly asymmetrical, pointed anteriorly, greatest width near middle of cup, outer side larger than inner side. Axis curved inward at junction of blade and platform. Platform lanceolate, and oral surface ornamented with fourteen parallel transverse ridges ending abruptly at median trough and slightly radiating from trough in anterior half of cup. Two rows of various sized six nodes developed in posterior part of inner platform along axis and a row of fewer numbers of node developed in outer platform. Median trough shallow and transverse section of oral surface of platform slightly concave.

Blade subequal in length to cup, thin troughout, with nine denticles. Denticles of blade largest near posterior end, chevron-like in lateral view, and coalesced at base. Carina short and restricted posterior end of cup. Aboral surface of expanded pulp cavity smooth, grooved along midline, its opening continued from blade.

Remarks:— It resembles ELLISON's (1941) specimens of *Streptognathodus wabaunsensis* Gunnell, but it has more simple ornamentation of nodes near posterior part of the platform and fewer numbers of denticles of blade.

S. excelsus STAUFFER and PLUMMER and *S. oppletus* ELLISON are also allied species of *S. expansus*. However, *S. excelsus* has more complicated ornamentation on the posterior part of cup, and *S. opletus* has longer carina than those of *S. expansus*.

Reg. no. 23033 (Holotype).

Genus *Gnathodus* PANDER, 1856

Gnathodus opimus IGO and KOIKE, n. sp.

Pl. 28, figs. 15–18

Axis straight to slightly angled inward at junction of blade and carina. Cup highly asymmetrical, pointed anteriorly, widest at two-thirds from anterior end, and outer side larger than inner side. Oral surface of cup plain and smooth.

Platform grooved by shallow trough along axis, deepest at posterior end, and ornamented with node-like parallel ridges longitudinally along carina. Denticles of carina rounded in tip, fused, node-like, and largest at widest part of platform.

Blade almost equal or slightly larger than carina, very thin, and subequal in thickness throughout. Denticles of blade coalesced with sharp edged tip, and chevron-like, which largest at posterior end and decreased in size anteriorly.

Aboral side of blade sharply edged, finely grooved along midline, merging into expanded pulp cavity. Aboral surface of pulp cavity smooth and grooved along midline and its opening continued from blade.

Remarks:—*Gnathodus opimus* resembles *G. dilatus* STAUFFER and PLUMMER and *G. roundyi* GUNNELL in two parallel ridges, but our specimens have rounded node-like low denticles of carina and more expanded pulp cavity. It is easily distinguishable from other described *Gnathodus* by smooth oral surface of cup.

Reg. no. 23030 (Holotype).

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Explanation of Plate 27

(All figs. ×75)

Figs. 1, 2. *Hindeodella sakagamii* IGO and KOIKE, n. sp.
1. Lateral view of the holotype, Reg. no. 23008.
2. Lateral view of a complete specimen.

Figs. 3–6. *Hindeodella paradelicatula* IGO and KOIKE, n. sp.
3. Lateral view of the holotype. Reg. no. 23006.
4. Lateral view of a complete specimen.
5, 6. Lateral view of two large imcomplete specimens.

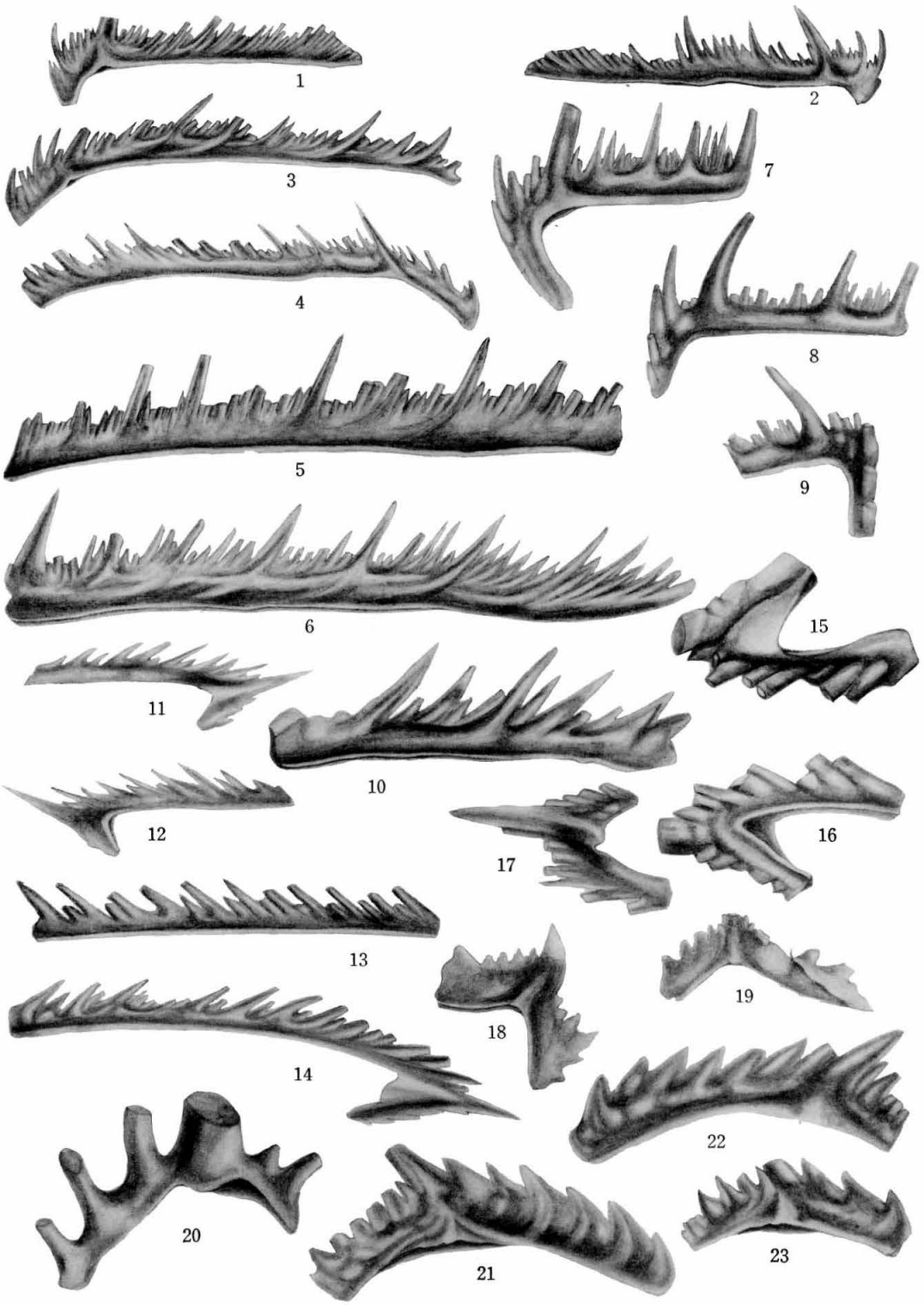
Figs. 7–10. *Hindeodella asiatica* IGO and KOIKE, n. sp.
7. Lateral view of the holotype. Reg. no. 23002.
8, 9. Lateral views of two incomplete specimens.
10. Posterior end of the posterior bar of a large specimen.

Figs. 11–17. *Synprioniodina microdenta* ELLISON
11, 12. Two lateral views of the same specimen.
13. Lateral view of posterior bar.
14. Lateral view of a complete specimen.
15, 16. Two lateral views of the same specimen.
17. Lateral view.

Figs. 18, 19. *Synprioniodina collinsoni* IGO and KOIKE, n. sp.
18. Lateral view of the holotype, Reg. no. 23028.
19. Lateral view.

Fig. 20. *Lonchodina ? nipponica* IGO and KOIKE, n. sp.
20. Lateral view of the holotype. Reg. no. 23037.

Figs. 21–23. *Ozarkodina orientale* IGO and KOIKE, n. sp.
21. Lateral view of the holotype, Reg. no. 23012.
22, 23. Lateral views of two incomplete specimens.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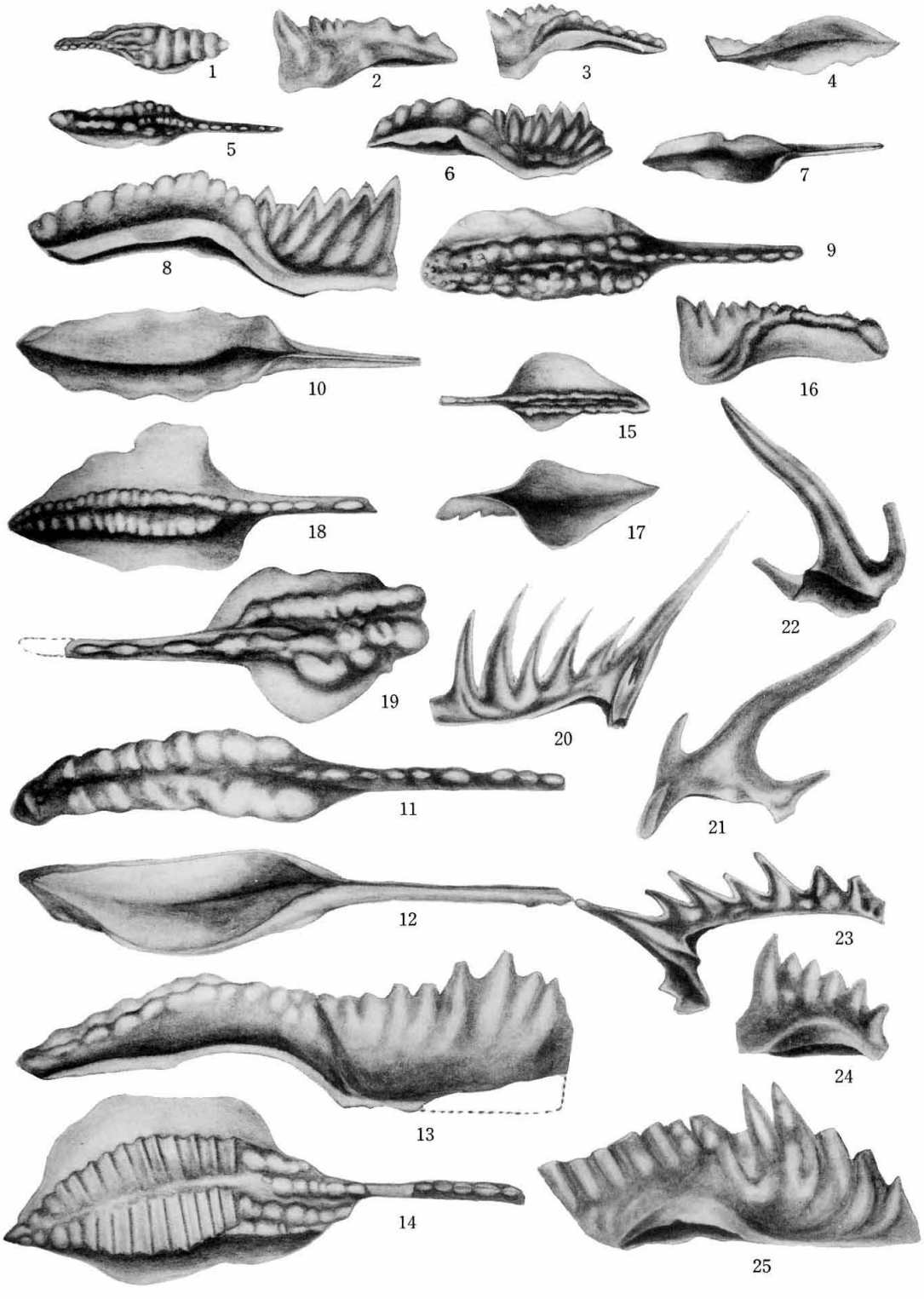
Explanation of Plate 28

(All figs. ×75)

Figs. 1-4. *Idiognathodus togashii* IGO and KOIKE, n. sp.
1. Oral view of holotype, Reg. no. 23034.
2-4. Two lateral views and aboral view of the same specimen.
Figs. 5-13. *Streptognathodus japonicus* IGO and KOIKE, n. sp.
5-7. Oral, lateral and aboral views of a small specimen.
8-10. Lateral, oral and aboral views of the holotype, Reg. no. 23032.
11-13. Oral, aboral and lateral views of a large specimen.
Fig. 14. *Streptognathodus expansus* IGO and KOIKE, n. sp.
14. Oral view of the holotype, Reg. no. 23033.
Figs. 15-18. *Gnathodus opimus* IGO and KOIKE, n. sp.
15-17. Oral, lateral and aboral views of the same specimen.
18. Oral view of the holotype, Reg. no. 23030.
Fig. 19. *Gnathodus* sp.
19. Oral view of an incomplete specimen.
Fig. 20. *Roundya subacodus* (GUNNELL)
20. Lateral view.
Fig. 21, 22. *Ligonodina hanaii* IGO and KOIKE, n. sp.
21. Lateral view of the holotype, Reg. no. 23038.
22. Lateral view of another specimen.
Fig. 23. *Euprioniodina dentata* IGO and KOIKE, n. sp.
23. Lateral view of the holotype, Reg. no. 23026.
Figs. 24, 25. *Spathognathodus echigoensis* IGO and KOIKE, n. sp.
24. Lateral view.
25. Lateral view of the holotype, Reg. no. 23036.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All specimens described herein were kept at the Institute of Geology and Mineralogy, Tokyo University of Education.

PROCEEDINGS OF THE PALAEONTOLOGICAL SOCIETY OF JAPAN

日本古生物学会1964年度総会および年会は1964年1月18・19日九州大学生物系防音教室101号室において開催された（出席者45名）。

会長講演

個人講演

報告

学　会　記　事

◎ 1963 年中に会員望月勝海君が死亡された。

◎ 1963 年度には審査の結果朝日科学奨励金候補に速水格君の「本邦中生代二枚介類の研究」毎日学術奨励金候補に西山省三君の「日本及び近接地産海胆類動物群の研究」偕成学術奨励金候補に菅野三郎君の「本邦新期漸新世層序並びに軟体動物化石群の研究」朝日賞候補に半沢正四郎君の「三層有孔虫類の研究」をそれぞれ推薦した。このうち西山省三君の研究には毎日学術奨励金が授与された。

◎ 1964 年 1 月 18 日九州大学で開催された本会総会において会則及び出版規定が次のように改正された。

a. 会則第 12 条　会費の金額は総会に計って定める。会費は普通会員年 1,000 円特別会員年 1,500 円賛助会員年 10,000 円以上とする。名誉会員は会費納入の義務がない。在外の会員は年 4 弗とする。

b. 出版規定：1 3. 原稿（挿図・地図・付表を含む）は 24 印刷頁（タイプライター用紙約 60 枚）を限度とする。

4. 図版（14.2×20 cm）は 2 枚を限度とする。

5. 挿図は 10 個合計60 坪（1 坪は 1 平方寸）を限度とし，白紙に墨または製図用インクにて明瞭に書き……。

7. 以上の限度をこえる場合はその費用を著者が負担する。また原稿が 4 印刷頁までの場合には挿図 2 個合計 12 坪をこえる挿図および図版の費用を著者が負担する。

（II 7. は削除し II 8 を II 7 に繰上げる。）　以　上

例　会・年　会　通　知

	開　催　地	開　催　日	講演申込締切日
第 87 回例会	京都大学	1964 年 6 月 7 日	1964 年 5 月 5 日
第 88 回例会	広島大学	1964 年 9 月 20 日	1964 年 8 月 20 日

第 87 回例会（京都大学）：「新生代後半の植物化石」についてのシンポジューム（世話人 松下　進）
第 88 回例会（広島大学）：「題未定」　（世話人 今村外治）

参加を希望する人は早目に世話人まで連絡されたい。

News

永らく Musée Royal d'Histoire Naturelles de Belgique の館長をしていた Prof. Dr. Victor Emile Van Straelen は，最近 Charles Darwin Foundation for the Galapagos Islands の President としてガラパゴスから帰り，本年 2 月 29 日幾多の業績を残して 75 歳の生涯を閉じた。

購読御希望の方は本会宛御申込下さい

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日本古生物学会会則　(1964, 1, 18)

第 1 条　本会は日本古生物学会という。

第 2 条　本会は古生物学およびこれに関係ある諸学科の進歩および普及を計るのを目的とする。

第 3 条　本会は第 2 条の目的を達するため次の事業を行う。

1. 会誌そのほかの出版物の発行。 2. 学術講演会の開催。
3. 普及のための採集会・講演会そのほかの開催。
4. 研究の援助・奨励および研究業績ならびに会務に対する功労の表彰その他第 2 条の目的達成に資すること。

第 4 条　本会の目的を達するため総会の議を経て本会に各種の研究委員会を置くことができる。

第 5 条　本会は古生物学およびこれに関係ある諸学科に興味を持つ会員で組織する。

第 6 条　会員を分けて普通会員・特別会員・賛助会員および名誉会員とする。

第 7 条　普通会員は所定の入会申込書を提出した者につき評議員会の議によって定める。

第 8 条　特別会員は本会に 10 年以上会員であり古生物学について業績のあるもので，特別会員 5 名の推薦のあったものにつき評議員会の議によって定める。

第 9 条　賛助会員は第 2 条の目的を賛助する法人で評議員会の推薦による。

第 10 条　名誉会員は古生物学について顕著な功績のある者につき評議員会が推薦し，総会の決議によって定める。

第 11 条　会員は第 12 条に定められた会費を納めなければならない。会員は会誌の配布を受け第 3 条に規定した事業に参加することができる。

第 12 条　会費の金額は総会に計って定める。会費は普通会員年 1,000 円，特別会員年 1,500 円，賛助会員年 10,000 円以上とする。名誉会員は会費納入の義務がない。在外の会員は年 4 弗とする。

第 13 条　本会の経費は会費・寄付金・補助金などによる。

第 14 条　会費を 1 ケ年以上滞納した者および本会の名誉を汚す行為のあった者は，評議員会の議を経て除名することができる。

第 15 条　本会の役員は会長 1 名，評議員 15 名とし，うち若干名を常務委員とする。任期は総て 2 年とし再選を妨げない。
会長の委嘱により本会に幹事および書記若干名を置くことができる。
常務委員は評議員会において互選される。評議員は特別会員の中から会員の通信選挙によって選出される。

第 16 条　会長は特別会員の中から評議員会において選出され，本会を代表し会務を管理する。
会長に事故ある場合は会長が臨時に代理を委嘱する。

第 17 条　本会には名誉会長を置くことができる，名誉会長は評議員会が推薦し総会の決議によつて定める。名誉会長は評議員会に参加することができる。

第 18 条　本会は毎年一回定例総会を開く。その議長には会長が当り本会運営の基本方針を決定する。
総会の議案は評議員会が決定する。
会長は必要があると認める時は臨時総会を召集する。総会は会員の十分の一以上の出席をもつて成立する。
会長は会員の三の分一以上の者が会議の目的たる事項および召集の理由を記載した書面をもつて総会召集の請求を受けた場合は臨時総会を召集する。

第 19 条　総会に出席しない会員は他の出席会員にその議決権の行使を委任することができる。但し，欠席会員の議決権の代行は 1 人 1 名に限る。

第 20 条　総会の議決は多数決により，可否同数の時は議長がこれを決める。

第 21 条　会長および評議員は評議員会を組織し，総会の決議による基本方針に従い運営要項を審議決定する。

第 22 条　常務委員は常務委員会を組織し評議員会の決議に基づいて会務を執行する。

第 23 条　本会の会計年度は毎年 1 月 1 日に始まり 12 月 31 日に終る。

第 24 条　本会会則を変更するには総会に付議し，その出席会員の三分の二以上の同意を得なければならない。

付　則　1) 評議員会の議決は総て無記名投票による。