HOKKAIDO UNIVERSITY

Title	Some Molluscan Fossils from the Cretaceous Deposits of Hokkaido and Japanese Saghalien Part II. Gastropoda
Author(s)	Nagao, Takumi
Citation	Journal of the Faculty of Science, Hokkaido Imperial University. Ser. 4, Geology and mineralogy, 4(3-4), 213-239
Issue Date	1939-02
Doc URL	https://hdl.handle.net/2115/35800
Type	departmental bulletin paper
File Information	4(3-4)_213-240.pdf

Hokkaido University Collection of Scholarly and Academic Papers : HUSCAP

SOME MOLLUSCAN FOSSILS FROM THE CRETACEOUS DEPOSITS OF HOKKAIDO AND JAPANESE SAGHALIEN

Part II. Gastropoda.[1]

By

Takumi NAGAO

With 3 Plates

Contribution from the Department of Geology and Mineralogy,
Faculty of Science, Hokkaidô Imperial University,
Sapporo; No. 207.

Part II contains the descriptions of the following twenty six forms of Gastropoda:

Ataphrus tesioensis NAGAO nov.
Epitonium? sp. indet.
Margarites sachalinensis NAGAO nov.
M. sachalinensis ornatus NAGAO nov.
M. (*Atira*) *depressus* NAGAO nov.
Natica (*Lunatia*) *ainuana* NAGAO nov.
N. (*L.*) *ainuana alta* NAGAO nov.
N. (*L.*) *denselineata* NAGAO nov.
N. (*L.*) sp. indet.
Turritella soratiensis NAGAO nov.
Glauconia (*Gymnentome*) sp. indet.
Cerithium isikarense NAGAO nov.
Dicroloma (*Perissoptera*) sp. indet.
Tessarolax cf. *acuticarinatus* NAGAO
Pugnellus (*Gymnarus*) *yabei* NAGAO nov.
Pseudogaleodea tricarinata NAGAO
Pyropsis sp. indet.
Semifusus (*Trochofusus*) *sachalinensis* NAGAO

(1) Part I. (Lamellibranchiata and Scaphopoda). This Journal, Ser. IV, Vol. Nos. 1-2, 1938, pp. 117–142, pls. XIV–XVI.

S. (*T.*) *tuberculatus* NAGAO nov.
Fusus volutodermoides NAGAO nov.
Pyrifusus (*Neptunella*) *kawakamiensis* NAGAO nov.
Piestochilus laevigatus NAGAO nov.
Sulculites fusoides NAGAO nov.
Actaeon sachalinensis NAGAO nov.
Avellana problematica NAGAO
Oligoptycha cf. *obliqua* (GABB)

Ataphrus, GABB.

Ataphrus tesioensis nov.

Pl. XX (I), Figs. 14–14b.

Shell small, depressed conical, much broader than high, consisting of five moderately rounded whorls, and with a low spire; sutures distinct, linear. Spire-whorls ornamented with very fine, crowded lines of growth which are very oblique to the upper suture and nearly invisible at the midheight of the whorls, but raised for a short distance from the upper suture in numerous flat, broad, and prominent bundles alternating with much narrower interspaces.

Body whorl very large, inflated, occupying about two-thirds of the total height, evenly rounded at the periphery; base faintly convex with a slightly concave band around the umbilical region. Aperture broad, obliquely elongated; outer lip injured, but apparently simple, thickened at the posterior end; inner lip smooth; columella much thickened, slightly produced, with a shallow longitudinal groove. No umbilicus. Body whorl ornamented, besides the prominent bundles of lines of growth near the suture, with numerous longitudinal impressed lines, which are distinct on the base, but become obsolete on the periphery. Base, moreover, with numerous transverse grooves. Test rather thick.

Dimensions:	Height	Breadth
	6.0 mm.	7.5 mm.

A single specimen has been observed. This species is similar to *A. crassus* GABB[1], the genotype of *Ataphrus* GABB, from the

(1) W. M. GABB: Paleontology of California, Vol. II, 1869, p. 171, pl. XXVIII, fig. 54. R. B. STEWART: GABB's California Fossil Type Gastropods. Proc. Acad. Nat. Sci. of Philadelphia, Vol. LXXVIII, 1926, p. 316, pl. XXIV, fig. 12.

Cretaceous of California, but the latter is smooth. *A. compactus* GABB[1] is higher than the Japanese form. By the presence of the spiral lines on the base, the new species is distinguishable from *A. pillai* PARONA[2] from the Upper Cretaceous of Italy and also from *A. yokoyamai* NAGAO[3] and *A. kitakamiensis* NAGAO[4] from the Lower Cretaceous of the Miyako district in Honsyû.

Locality and geological horizon: A small tributary of the Abesinai-gawa, near the postal service station, Nakagawa-gun, province of Tesio, Hokkaidô; Upper Ammonites bed.

Epitonium, BOLTEN.

Epitonium? sp. indet.

Pl. XXI (II), Fig. 3.

A very poorly preserved specimen of a turreted shell represented by the last two whorls, has been obtained from Saghalien.

Shell small. Penultimate whorl slightly broader than high, a little convex, separated from the last whorl by a distinct and somewhat appressed suture, and ornamented with transverse ribs and longitudinal lines; transverse ribs about eighteen in number, rather broad, raised and alternated with broader, concave interspaces; longitudinal lines fine, crowded, wavy, and more or less irregular in strength and distance from one another; there are two prominent longitudinal ridges near the upper suture, tubercular on crossing the transverse ribs. No true varix. Lines of growth fine, crowded.

Last whorl roundly angulated at the periphery, bearing a broad longitudinal ridge; base separated from the sides by a distinct groove, and ornamented with a few narrow longitudinal lines, the transverse ribs not much extending onto the base. Aperture not well exposed, but apparently rather small; columella unknown.

---

(1) W. M. GABB: Paleontology of California, Vol. I, 1864, p. 132, pl. XX, fig. 89. R. B. STEWART: GABB's California Fossil Type Gastropods. Op. cit., p. 316, pl. XXIV, fig. 5.

(2) C. F. PARONA: La Fauna Coralligene del Cretaceo dei Monti d'Ocre. Mem. por service Alla descrizione della carta geologica d'Italia, Vol. V, 1909, p. 204, pl. XXIII, figs. 32, 33.

(3) T. NAGAO: Cretaceous Mollusca from the Miyako District, Honshû, Japan. This Journal, Ser. IV, Vol, 1934, p. 234, pl. XXXV, figs. 2, 3.

(4) T. NAGAO: Ibid., p. 235, pl. XXXIX, figs. 7, 10.

Dimensions:	Height (as preserved)	Breadth
	6 mm.	5 mm.

Locality and geological horizon: the Nisiho-gawa near the Kawakami Colliery, Toyohara-gun, Saghalien; Upper Ammonites bed.

Margarites (LEACH) GRAY

Margarites sachalinensis nov.

Pl. XX (I), Figs. 11–13a.

Shell small, trochoid, with a more or less elevated spire; whorls about five in number, sloped and convex on the sides, separated by distinct, linear sutures which are bordered by a raised rim of the succeeding whorl; surface below the upper rim narrowly flattened with a few fine longitudinal lines.

Body whorl ventricose, occupying about one half of the total height, very obtusely biangulated, the angle rather rounded, limiting the flat and nearly horizontal upper surface, and the lower one separating the base from the sides. Base convex with a rather narrow and deep umbilicus; umbilical margin usually rounded, but sometimes distinctly angulated. Aperture incompletely preserved, very likely subquadrate. Ornamentation consisting of a number of narrow nearly equal longitudinal lines in alternation with slightly broader interspaces besides numerous crowded, very oblique lines of growth; these lines become sometimes nearly obsolete upwards from the lower angle. The upper rim ornamented with two narrow, raised longitudinal lines and finely reticulated by more or less distinct, transverse lines; umbilical region sometimes rather coarsely reticulated by crossing of raised transverse lines and often prominent longitudinal ones.

Dimensions:	Height	Breadth
	19 mm.	17 mm.

A number of the specimens of this species have been examined. This species is closely similar to *M. funiculatus* YOKOYAMA[1] from the Trigonia Sandstone of Hokkaidô. A few specimens of the latter, though imperfect, in the collection of our laboratory show that *M.*

(1) M. YOKOYAMA: Verteinerungen aus der japanischen Kreide. Palaeontographica, Vol. XXXVI, 1890, p. 197, pl. XX, fig. 13.

funiculata is relatively broader, with the longitudinal lines more distinct even on the sides of the body whorl than in the Saghalien form. The umbilical wall in *M. funiculata* is ornamented with rather strong longitudinal lines all over and separated from the base by a groove. Some specimens with a distinctly angulated umbilical border seem to be related to *Atira* STEWART.

Localities and geological horizon: the Nisiho-gawa near the Kawakami Colliery, Toyohara-gun, Saghalien; Upper Ammonites bed. A few specimens referable to this species have been obtained from the Upper Ammonites bed of the Omosirusibetu and the Osôsinai-zawa, tributaries of the Abesinai-gawa, province of Tesio.

Margarites sachalinensis ornatus nov.

Pl. XX (I), Fig. 10.

A specimen very similar to the preceding form has been obtained from the same locality. It has no raised and distinct infrasutural rim, observable in the preceding one, and the upper portion of the whorls is ornamented with numerous, rather regular, and distant oblique, transverse ridges, which become obsolete downward near the periphery. About five narrow, slightly raised longitudinal lines are present in the upper portion of the body whorl.

Dimensions:	Height	Breadth
	5.3 mm.	4.5 mm.

Locality and geological horizon: the Nisiho-gawa near the Kawakami Colliery, Toyohara-gun, Saghalien; Upper Ammonites bed.

(*Atira*, STEWART)

Margarites (*Atira*) *depressus* nov.

Pl. XX (I), Figs. 15–15b.

Shell small, depressed conical; the apex being missing but presumably rather elevated. Penultimate whorl rather broad, moderately convex at the shoulder, flat and vertical below, faintly excavated in the upper portion, this excavation bordered externally by an obtuse angle and above by a raised rim along the upper suture; suture deep, somewhat canaliculated.

Body whorl large, apparently occupying about one half of the total height of the shell; sides convex, subangulated at the shoulder, surface above this angle somewhat flattened and sloped; lower angle very rounded and obtuse. Base flatly convex with a narrow and deep umbilicus bordered by a round but distinct angle, the umbilical wall being steep and slightly excavated; aperture subovate, narrowly angulated posteriorly, and the anterior border broadly rounded with an obtuse angle between it and the columellar border. No distinct callosity developed.

Penultimate whorl rather smooth, except for fine, dense, oblique lines of growth and almost invisible longitudinal striae. Body whorl very minutely cancellated by numerous longitudinal and transverse striae; the longitudinal striae crowded, alternated with narrower grooves, less distinct and nearly obsolete on the sides and raised in numerous rather regular oblique ridges near the upper margin, the latter being finely crenulated by these ridges.

Dimensions:	Height (as preserved)	Breadth
	ca. 10 mm.?	9.5 mm.

A single specimen with the body whorl and the penultimate one preserved is at hand. This form resembles *"Angaria" ornatissima* GABB[1] from the Chico group of California, the type of Atira STEWART[2]. Atira is considered by STEWART as a subgenus of Margarites. The Japanese species seems to be distinguished from the subgenotype, above referred to, in having a broader body whorl with the upper rim more prominent and ornamented with more distinct transverse ridges. *M.* (*A.*) *inornatus* (GABB)[3] is different from the specimens at hand in being more depressed with more convex sides and ornamented with broader longitudinal striae on the base and in the umbilicus as well.

This species is distinguishable from the preceeding one and from *M. funiculatus* YOKOYAMA[4] in having finer and more crowded longitudinal striae, besides a more distinctly angulated umbilical border.

(1) W. M. GABB: Paleontology of California, Vol. I, 1964, p. 121, pl. XX, fig. 78. J. F. WHITEAVES: Mesozoic Fossils, Vol. I, Pt. 2, 1879, p. 128; Pt. V, 1903, p. 368. R. B. STEWART: GABB's California Fossil Type Gastropods. Op. cit., p. 315, pl. XXIV, fig. 1.

(2) R. B. STEWART: Ibid., p. 315.

(3) W. M. GABB: Paleontology of California, Vol. I, 1864, p. 118, fig. 73; Vol. II, 1869, p. 224. R. S. STEWART; GABB's California Fossil Type Gastropods. Op. cit., p. 315, pl. XXIV, figs. 2, 4.

(4) M. YOKOYAMA: Verst. japan. Kreide. Op. cit., p. 197, XX, fig. 13.

Locality and geological horizon: Takinosawa, Toyohara-gun, Saghalien; Upper Ammonites bed.

Natica, SCOPOLI.

(*Lunatia* GRAY)

Natica (*Lunatia*) *ainuana* nov.

Pl. XXI (II), Figs. 11–11c.

Shell relatively small, with an acute, rather elevated spire composed of five or six convex whorls; sutures distinct, somewhat canaliculated but not depressed.

Body whorl ventricose, rather low, slightly exceeding the spire in height; periphery relatively narrowly convex; umbilicus narrow; aperture semicircular, narrowed and angulated posteriorly, and broader anteriorly; callosity indistinct; inner lip oblique, straight, slightly thickened and a little reflected.

Surface finely reticulated by longitudinal striae and transverse lines; longitudinal striae numerous, crowded, narrow, wavy, subequal, and alternated with narrower grooves; transverse lines also fine and crowded, frequently gathered to form numerous broad and raised ridges.

Dimensions:	Height	Breadth
	19 mm.	17 mm.

A number of specimens have been examined. The outline of the shell seems to be somewhat variable, the body whorl being sometimes more ventricose and lower than in other specimens. The longitudinal striae are often faint, but the transverse ridges are always well developed.

This species is similar to *Lunatia concinna* HALL and MEEK[1] and *L. occidentalis* MEEK and HAYDEN[2] from North America. The first of these American species seems to be slightly more ventricose with a shorter spire than the present form, and the second is provided with a larger apical angle and a slightly higher body whorl.

---

(1) F. B. MEEK: Rep. Cret. and Tert. Foss. Up. Miss. Country. U. S. Geol. Surv. Terr., Vol. IX, 1876, p. 314, pl. XXXII, fig. 11.

(2) F. B. MEEK: Ibid., p. 315, pl. XXXII, figs. 12.

On the other hand, the species under consideration is also akin to *N. cassiana* D'ORB.[1] from the Cenomanian of France, especially to the specimens figured by DE LORIOL from Cosne. This European species, however, seems to be higher and to have no distinct umbilicus. COSSMANN[2] regarded this form as belonging to *Vanikoropsis*.

Localities and geological horizon: the Kawakami Colliery, Toyohara-gun, (the type); the Nisiho-gawa near the same colliery; the Uryû-gawa, Uryû-gun, these three localities being in Saghalien. The Osôsinai-zawa, a tributary of the Abesinai-gawa, province of Tesio; Upper Ammonites bed.

Natica (Lunatia) ainuana alta nov.

Pl. XXI (II), Figs. 9, 9a, 10.

There is at hand a specimen very closely similar to the preceding form, the ornamentation and the umbilicus being identical with those of the latter. In the present specimen, however, the spire is lower and the body whorl higher, narrower, and more broadly convex at the sides, than in the preceding form. If these features are not due to a different state of preservation, the writer is warranted to consider this as a subspecies of *N. ainuana*.

There is from Aton also a further specimen (fig. 10) quite identical to the present form; the longitudinal striae are not observable in it and it resembles *N.* (*L.*) *ezoana* YABE and NAGAO[3], but otherwise is similar to the specimen above cited.

Locality and geological horizon: Aton, Sisuka-gun, Saghalien; the Upper Ammonites bed.

Natica (Lunatia) denselineata nov.

Pl. XX (I), Figs. 16, 16a.

Shell rather small, probably composed of about five whorls; spire very short, the apex itself being missing. Penultimate whorl

(1) A. D'ORBIGNY: Pal. Franç. Terr. Crét., Vol. II, 1842, p. 166, pl. 175, figs. 1–4. P. DE LORIOL: Etudes sur la Faune des couches du Gault de Cosne. Mém. Soc. Pal. Suisse, Vol. IX, 1882, p. 24, pl. III, figs. 14–15.

(2) M. COSSMANN; Ess. Pal. Comp., Vol. XII, p. 41.

(3) H. YABE and T. NAGAO: Cret. Foss. Hokkaidô: Annelida, Gostropoda and Lamellibranchiata. Sci. Rep. Tôhoku Imp. Univ., Sec. Ser., Vol. IX, 1928, p. 93, pl. XVII, figs. 18, 18a.

broad, low, moderately convex, with fine oblique lines of growth and numerous, very fine, faintly visible longitudinal striae.

Body whorl very large, ventricose, occupying about one-fourth of the total height of the shell, rather evenly convex; suture distinct, deep, and somewhat canaliculated; umibilcus very narrow; aperture broad and long, obliquely a little produced, narrow and angulated posteriorly, broadly rounded anteriorly; inner lip sinuous, oblique; callosity not well developed. Surface somewhat polished, finely sculptured transversely and longitudinally; transverse lines of growth, oblique to the suture, fine, dense; longitudinal striae very fine, wavy, crowded, and alternated with narrower impressed lines.

Dimensions:	Height	Breadth
	(the type) ca. 17 mm.	16 mm.

This species is distinguished from *N.* (*L.*) *ainuana* nov. by its lower spire and higher body whorl. The latter and its subspecies *alta* nov. are both ornamented with a coarser spiral sculpture and more rude transverse ridges than the present form. *N.* (*L.*) *importuna* NAGAO[1] from the Lower Cretaceous of the Miyako district in Honsyû has a higher and smooth shell. *N.* (*L.*) *ezoana* YABE and NAGAO[2] is closely related to the present species but has a finer transverse sculpture, no longitudinal sculpture, and apparently more broadly canaliculated sutures.

Localities and geological horizon; The first tributary of the Umpei-gawa, Uryû, Rûtaka-gun, and the Nisiho-gawa, Toyohara-gun, Saghalien; the Sibunnai-zawa, a tributary of the Abesinai-gawa, province of Tesio, Hokkaidô, and a point along the latter river, 300 m. upstream from the mouth of its tributary, the Wakkawen; Upper Ammonites bed.

Natica (*Lunatia?*) sp. indet.

An imperfect and deformed specimen from the Kawakami Colliery and another ill preserved one from Aton, Sisuka-gun, Saghalien.

These two specimens are too poor for specific determination. However, they have a rather low spire and a smooth body whorl ex-

(1) T. NAGAO: Cretaceous Mollusca from the Miyako District, Honshû, Japan. This Journal, Ser. IV, Vol. II, No. 3, 1934, p. 244, pl. XXXV, figs. 8, 9, 15.

(2) H. YABE and T. NAGAO: Cret. Foss. Hokkaidô: Annelida, Gastropoda and Lamellibranchiata. Op. cit., p. 93, pl. XVIII, figs. 18, 18a.

cept for lines of growth which are sometimes rude. In these points they seem to be specifically identical with or to stand near *N.* (*L.*) *ezoana* YABE and NAGAO[1] from the Trigonia Sandstone of Hokkaido.

Localities and geological horizon: the Kawakami Colliery, Toyohara-gun, and Aton, Sisuka-gun, both in Saghalien; Upper Ammonites bed.

The specimen from Aton has come from the same locality as *N.* (*L.*) *ainuana* alta nov. to which it is somewhat akin, and if it is really smooth, then it may be distinct from that form as discussed before.

Turritella, LAM.

Turritella saratiensis nov.

Pl. XXI (II), Figs. 6–6b.

Shell small, very high-turreted with the sides divergent at an angle of about 15°, very slowly increasing in diameter from the apex downward. Seven whorls preserved, both extremities being broken. Each whorl narrow, high, nearly as high as broad, flattened, faintly biangulated, excavated especially at the lower portion. Ornamentation consisting of five relatively narrow and distant revolving ribs; of the ribs, the uppermost and the lowermost ones finer than the other three and situated along the sutures, the second and fourth ribs most prominent and broadest of all and placed on the two angles; the interspaces between the ribs broad, with a fine revolving line, and subequal in distance from one another, except the uppermost one which is the broadest. Last whorl slightly larger than the next upper one; aperture small and presumably quadrate.

Dimensions:	Height (as preserved)	Breadth
	ca. 16 mm.	4 mm.

A small imperfect specimen has come under examination. The surface is somewhat weathered. The ribs are not granulated but, not impossibly, this is owing to the state of preservation.

A species of *Turritella*, very high-turreted with flat whorls and five-ribbed, was reported by STOLICZKA[2] from the Utatur group of

(1) H. YABE and T. NAGAO: Cret. Foss. Hokkaidô. Op. cit., 1928, p. 93, pl. XVII, figs. 18, 18a.

(2) F. STOLICZKA: Gastropoda of the Cretaceous Rocks of Southern India. Palaeontologia Indica, 1867, p. 222, pl. XVII, fig. 7; pl. XIX, figs. 20, 21.

Southern India and indentified with *T. nodosa* RÖMER from Europe. This Indian form is somewhat akin to the Japanese one under consideration, but it is distinguished in having numerous fine striations in the interspaces between the ribs. Of the ribs in that form the upper four are equally strong. *T. quinquecincta* GOLDF.,[1] considered by STOLICZKA as conspecific with *T. nodosa*, has the fourth rib the strongest. In these two foreign fossils the ribs are distinctly granulated. *T. seriatimgranulata* RÖMER[2] from Texas seems to be distinguishable from the present specimen in having five subequal and prominently granulated ribs. *T. seriatim-granulata* GABB[3] of the Chico of California, placed under the subgenus Mesalia by STEWART, differs from the new species in being differently sculptured.

Locality and geological horizon: the exact locality uncertain, but most probably the Tômatu-zawa, a tributary of the Ikusyumbetu, province of Isikari; Trigonia Sandstone?, the matrix being the same as the sandstone of the Trigonia Sandstone exposed along the Ikusyumbetu-gawa and the Tomatu-zawa.

Glauconia, GIEBEL.

(*Gymnentome*, COSSMANN)

Glauconia (*Gymnentome*) sp. indet.

Pl. XX (I), Fig. 9.

Two very poorly preserved specimens have been obtained from the Isikari Coal-field.

Shell turreted with a rather low spire, composed probably of nine or ten whorls, of which six are preserved in one of the specimens. Each whorl broad, low, with the sides flat, obliquely sloped downward, somewhat excavated in the upper portion.

Last whorl with a round periphery which is ornamented with two strong longitudinal keels; the surface above the upper keel distinctly excavated; base flatly convex.

One of the specimens measures about 60 mm. in height as preserved.

---

(1) A. GOLDFUSS: Petr. Germaniae, Vol. III, 1844, p. 106, pl. CXCVII, fig. 17.

(2) F. RÖMER: Kreidebild. v. Texas, 1852, p. 39, pl. IV, figs. 12a, b.

(3) W. M. GABB: Paleontology of California, Vol. I, 1864, p. 132, pl. XX, fig. 88. R. B. STWART: GABB's California Fossil Type Gastropods, 1926, p. 348, pl. XXI, fig. 2.

Locality and geological horizon; Sentaro-zawa?, Mikasayama-mura, Sorati-gun, province of Isikari; probably from Trigonia Sandstone.

Cerithium, BRUGUIÈRE.

Cerithium (s. l.) isikarense nov.

Pl. XXI (II), Fig. 4.

Shell very small, high-turreted, very slowly increasing in daimeter downwards, and the sides divergent at an angle of about 20°. Each whorl flat, excavated narrowly along the lower margin, ornamented with three spiral and numerous transverse ribs; the ribs broad, flatly rounded on top, the lowest rib the largest; interspaces between the ribs excavated, much narrower than the ribs themselves, the lowest one the broadest; the transverse ribs number about twenty, somewhat continuous from one whorl to another, giving a granular appearanc to the spiral ribs on crossing; on the lower whorls these transverse ribs less distinct.

Last whorl, probably the body one, a little larger than the penultimate, flat, spirally three-ribbed; the lowest ribs situated on the rounded lower angle flat. Base slightly convex, abruptly contracted toward the end, its upper portion ornamented spirally with two ribs with a narrower groove between, the remaining portion smooth except for the lines of growth.

Aperture broad, short; outer lip injured, but seemingly thin and smooth; inner lip excavated; columella very short, with a strong plate; anterior canal short, twisted.

The height is about 9.5 mm. as preserved.

This species is somewhat similar to *C. quadricostatum* KAUNHOWEN[1] from Europe which is ornamented with four spiral ribs. *C. sanchuensis* YABE and NAGAO[2] is easily distinguished from the present form in having more numerous granules. The middle one of the three spiral ribs is the weakest in the former.

Locality and geological horizon; Asahi-mati, Yûbari-mati, province of Isikari; the top of the Trigonia Sandstone or the basal part of the Upper Ammonites bed.

---

(1) F. KAUNHOWEN: Das Gastropoden der Maestrichter Kreide. Pal. Abh., Vol. VII, 1897, p. 61, pl. VI, fig. 3.

(2) H. YABE, T. NAGAO, and S. SHIMIZU; Cret. Moll. Sanchû Graben. Sci. Rep. Tôhoku Imp. Univ., Sec. Ser., Vol. IX, 1926, p. 66, pl. XIV, figs. 12–14.

Dicroloma, GABB.

(*Perissoptera*, TATE)

Dicroloma (*Perissoptera*) sp. indet.

Pl. XXI (II), Fig. 2.

There is at hand an imperfect specimen of a fusiform and transversely ribbed shell.

Shell small, subfusiform with a high spire; whorls presumably 7 or 8 in number, high, slightly convex, separated from one another by a distinct suture, and ornamented with about twelve nearly vertical transverse ribs.

Body-whorl slightly larger than the penultimate one, inflated, high, with prominent transverse ribs which are somewhat sinuous.

This form is tentatively considered as belonging to *Perissoptera*.

Locality and geological horizon: The Abesinai-gawa, province of Tesio; Upper Ammonites bed.

Tessarolax, GABB.

Tessarolax cf. acuticalinatus NAGAO

Pl. XXII (III), Fig. 9.

Compare:

1932. *Tessarolax acuticalinatus* NAGAO: Some Cretaceous Mollusca from Japanese Saghalien and Hokkaido (Lamellibrachiata and Gastropoda). This Journal, Ser. IV, Vol. II, p. 43, pl. VI, figs. 10, 15.

This species was founded on two specimens, one from the Kawakami Colliery in Saghalien and the other from the Abesinai district in the province of Tesio.

In the material under examination there is an imperfect specimen collected from the Yûbari coal-field, which is similar to that species. The cotypes have been derived from the Upper Ammonites bed, while the specimen at hand was obtained from the top of the Trigonia Sandstone or more probably from the basal part of the Upper Ammonites bed.

The specimen is represented by a nearly perfect cast with the sculpture partly preserved.

If it is really conspecific with *T. acuticarinatus*, it must be an immature individual, the last whorl with the expanded outer lip having not appeared.

Locality and geological horizon: Asahi-mati, Yûbari-mati, province of Isikari; the top of the Trigonia Sandstone or the basal part of the Upper Ammonites bed.

Pugnellus, CONRAD.

(*Gymnarus*, GABB)

Pugnellus (*Gymnarus*) *yabei* nov.

Pl. XX (I), Figs. 1–8.

1928. *Pugnellus* sp. YABE and NAGAO; Cretaceous Fossils from Hokkaidô. Sci. Rep. Tôhoku Imp. Univ., Sec. Ser., Vol. IX, p. 95, pl. XVIII, fig. 17.

Shell rather small, thin-tested; spire moderately elevated, composed of about five convex whorls with sinuous axial ribs; sutures distinct.

Body whorl large, moderately inflated, very high, occupying about three-fourths of the total height, evenly convex above, contracted and elongated below. Aperture rather broad, long, acutely angulated posteriorly; anterior canal long, nearly vertical, straight, not deeply notched; inner lip slightly excavated, oblique above and almost vertical below; outer lip relatively thin, being only slightly thickened, broadly and distinctly excavated above, expanded with a hook-like prolongation; the prolongation curved upward, terminating in an acute end, trigonal in lateral view, and crescentic in cross-section, with a ridge outside, continuing with a round angle of the body whorl which becomes obsolete in a short distance backward from the outer lip; the lower border of the prolongation slightly excavated at its origin, from this point the outer lip nearly straight downward. Callosity well developed, extending over the body whorl, and almost covering the whole ventral surface of the shell up to the apex.

Surface ornamented with numerous axial ribs which are crowded, strongly sinuous, being nearly vertical on the upper part, much curved on the shoulder, where they are most prominent and form obliquely elongated strong nodes.

Dimensions:	Height	Breadth
	25 mm.+	14 mm. (lower end missing)
	25 mm.+	13 mm. ,,
	28 mm.	13 mm.

An imperfect specimen derived from the Trigonia Sandstone of the Isikari Coal-field, was described and figured in 1928, without a specific name. Later more than one hundred specimens some of which are well preserved, were collected at the same locality and subjected to examination.

The present form belongs to *Gymnarus* GABB and as previously stated, is akin to *P.* (*G.*) *manubriatus* GABB[1] from the Chico group of California. Compared with the figures of GABB's specimens given by STEWART, the Japanese species is distinguished in having a higher and narrower body whorl with a narrower and longer anterior canal and more distinctly nodulous axial ribs. It has an allied species in the Cretaceous of Southern India (the Trichinopoly group), *P. contortus* SOW.[2], but the latter has less numerous and stronger axial ribs and an outer lip prolongation of different form.

Localities and geological horizon: the Itinosawa, a tributary of the Horomui-gawa; a specimen from Sentaro-zawa, Mikasayama-mura, both in the province of Isikari; Trigonia Sandstone.

Pseudogaleodea, NAGAO.

Pseudogaleodea tricarinata NAGAO

1932. *Pseudogaleodea tricarinata* NAGAO: Some Cret. Moll. Japan. Saghalien and Hokkaidô. This Journal, Vol. II, p. 46, Pl. VII, figs. 1–7.

This species was founded on several specimens from the Upper Ammonites bed exposed in the neighborhood of the Kawakami Colliery, Saghalien. A specimen has been obtained by Mr. SAMBONSUGI from the equivalent formation developed in the Urakawa district. This is the first occurrence of this peculiar fossil, as far as the writer is aware, from outside of Saghalien.

Locality and geological horizon: the Upper course of the Tinomigawa near Urakawa, province of Hidaka; Upper Ammonites bed.

---

(1) W. M. GABB: Paleontology of California, Vol. I, 1964, p. 125, pl. XXI, fig. 229. R. B. STEWART: GABB's California Fossil Type Gastropods. Op. cit., p. 358, pl. XX, figs. 10–12.

(2) F. STOLICZKA: The Gastopoda of the Cretaceous Rocks of Southern India. Palaeontologia Indica, V. 1867, p. 19, pl. III, figs. 1–5.

Pyropsis, CONRAD.

Pyropsis sp. indet.

Pl. XXI (II), Figs. 5–5b.

Shell infalted with a low spire composed of about 5 whorls; spire-whorl low, flat or slightly convex, with ten to twelve rounded, low, and laterally compressed nodes separated by narrower interspaces; suture distinct, circumscribed by the inflated upper margin of the next lower whorl. Body whorl very infalted above, contracted rather abruptly below, broad and round shouldered; upper surface gently inclined downwards and faintly excavated, with three equidistant fine revolving striae; shoulder rounded, with three narrow, elevated carinae, of which the upper one is situated on the upper margin of the shoulder and the lowest and weakest one at the boundary with the base; the carinae crossed by about ten axial ridges which do not extend below the third carina, giving to the ridges a nodular appearance. Base weakly convex above, abruptly tapering below, ornamented with rather strong, equidistant revolving lines, separated from one another by slightly broader interspaces with a finer line; base, moreover, with about five revolving lines in its upper portion, the remaining portion apparently smooth. Lines of growth crowded, very convex backwards on the upper surface, swinging forwards on the shoulder. Aperture broad above, abruptly narrowed below, indicating the presence of a narrow, oblique anterior canal of unknown length, only its basal portion being preserved; inner lip imperfect, excavated below. Columella oblique, thickened and reflected over the whorl; outer lip, as shown by the lines of growth, shallowly and broadly excavated above.

A single imperfect specimen.

Since a greater part of the anterior canal is missing, the generic position of the present form is doubtful, but it appears most probably to belong to *Pyropsis*, and to be distinguished from *"Rapa" nocifera* STOL.[1], from the Trichinopoly group of India by its more rounded and less tabulated body whorl.

On the other hand, this form may be related to *"Rapa" monheimi* MÜLLER[2] from the Senonian of Europe which Holzapfel placed under

(1) F. STOLICZKA: Gastropoda of the Cretaceous Rocks of Southern India. Op. cit., p. 153, pl. XII, figs. 10, 11.

(2) E. HOLZAPFEL: Die Mollusken der Aachener Kreide. Palaeontographica, Vol. XXXIV, 1988, p. 106, pl. XI, figs. 4–7.

Tudicula and COSSMANN included in *Streptosiphon;* the Japanese fossil is not so excavated above the shoulder as the European form. A number of species referred to *Pyropsis* have been reported from the Cretaceous of New Jersey by WHITFIELD(1) and later by WELLER(2), to none of which the Japanese shell seems to be identical.

Locality and geological horizon: The middle course of the Abesinai-gawa, province of Tesio; the lower part of the Upper Ammonites bed.

Semifusus, SWAINSON.

(*Trochofusus* Nov. Subgen.)

Semifusus (Trochofusus) schalinensis NAGAO

Pl. XXI (II), Figs. 1, 1a.

1932. *Semifusus (Mayeria?) sachalinensis* NAGAO: Some Cretaceous Mollusca from Japanese Saghalien and Hokkaidô (Lamellibranchiata and Gastropoda). This Journal, Ser, IV, Vol. II, p. 47, pl. VII, figs. 8–11.

This species was founded on a few rather well preserved specimens from Oku-Kawakami along the Suzuya-gawa, Saghalien. A large specimen referable to this species has been obtained recently from the Niitoi district.

This form is characterized by its rather short, inflated body whorl which is, moreover, abruptly constricted below, ending in a very short and slightly oblique anterior canal. It was tentatively included in *Mayeria* BELLARDI. It is, however, different in various points from the type species of *Mayeria, M. autissima* BELL.(3) of the Miocene of Italy, especially in respect to having a very short and oblique anterior canal. On the other hand, the Japanese species is, as previously stated, rather closely akin to *Serrifusus dakotensis* (MEEK and HAYDEN)(4). The Dakota species has, judged from the

(1) R. P. WHITFIELD: Gastropoda and Cepholopada of the Raritan Clays and Greensand Marls of New Jersey. Monogr. U. S. Geol. Surv., Vol. XVIII, 1892, pp. 35–45.

(2) S. WELLER: A Report on the Cretaceous Paleontology of New Jersey. Geol. Surv. N. J., Pal. Ser., Vol. IV, 1907, pp. 739–753.

(3) L. BELLARDI: I Molluschi dei Terreni Tenziari del Piemonte e della Liguria, Pt. 1, 1872, p. 157, Pl. X, fig. 7.

(4) F. B. MEEK: A Report of the Inverterbrate Cretaceous and Tertiary Fossiles of the Upper Missouri Country. Op. cit., p. 374, pl. XXXI, fig. 11; Pl. XXXII, fig. 6.

figures given by MEEK, a longer anterior canal, but its variety *vanconverensis* WHITEAVES[1] is very closely similar to ours. "The validity of *serrifusus* MEEK is sometimes doubted owing to the very incomplete state of the type species and attention has been called to its close resemblance to *Semifusus proboscidiferus* (LAM.). This recent species has also a longer anterior canal than ours under consideration[2]." Under these circumstances, the writer is warranted to create a new subgenus, *Trochofusus*, with the present species from Saghalien as the type, and to place it tentatively under *Semifusus*. As has been mentioned *Serrifusus vanconverensis* WHITEAVES is most likely closely related to the present specimens. Whether the type of *Serrifusus, S. dakotensis* (MEEK and HAYDEN), may or may not show a close relationship is uncertain.

Locality and geological horizon: The upper course of the Niitoi-gawa, about 20 kirometers from its mouth, Sisuka-gun, Saghalien; Upper Ammonites bed.

Semifusus (Trochofusus) tuberculatus nov.

Pl. XXII (II), Figs. 1–4.

Shell medium in size with a high spire composed of six or seven whorls; sutures distinct. Each spire-whorl relatively low, sharply angulated below the middle of the depth, with a broad, gently sloping flat upper surface and a narrower, inwardly inclined lower one; the angle bearing a prominent, narrow spiral carina traversed by about ten oblique ridges which are raised into prominent tubercles on crossing the carina and fade upward rather abruptly near the upper suture; interspaces between the ridges concave, broad. Surface ornamented, moreover, with densely crowded oblique lines of growth and numerous fine, sometimes alternating longitudinal striae which are most distinct on the lower surface and often obsolete near the upper suture.

Body whorl nearly as high as the spire, inflated, prominently angulated at the shoulder with a narrow carina; transverse ridges numbering about twelve, rather broad, round-topped, elevated on the angle in acute tubercles; below the angle there are two minute carinae

(1) J. F. WHITEAVES: Mesozoic Fossils, Vol. I, pt. 2, 1879, p. 119, pl. XV, fig. 5.

(2) T. NAGAO: Some Cretaceous Mollusca from Japanese Saghalien and Hokkaido, 1932, p. 49.

besides numerous crowded revolving striae; base a little convex with numerous somewhat equal revolving striae all over. Aperture broad, short, subovate, anteriorly narrowed, ending in a very short and slightly oblique anterior canal; outer lip smooth, thin; inner one remarkably excavated, smooth; columella non-perforate, slightly twisted and obliquely truncated.

Dimensions:	Height	Breadth
	ca. 26 mm.	18 mm.
	ca. 29 mm.	22 mm.
	64 mm.	41 mm.

Six specimens, of which one is represented by an internal mould.

This species is easily distinguished from the preceding in being ornamented with prominent tubercles on the angle of the whorls.

The revolving striae are relatively distinct on the upper whorls and in the young specimens but they become more obsolete on the lower whorls or in the larger specimens in which the lines of growth are sometimes more pronounced than the revolving striae.

Localities and geological horizon: Nakayama near the Kawakami Colliery and Oku-Kawakami along the Suzuya-gawa, both in Toyohara-gun, Saghalien; the Abesinai-gawa, about 100 m. upstream from the junction of it with its tributary, the Sakai-zawa, province of Tesio, and Kami-Hobetu, Yûhutu-gun, province of Iburi, these two latter localities being in Hokkaidô; Upper Ammonites bed.

Fusus, KLEIN.

Fusus (s. l.) volutodermoides nov.

Pl. XXII (III), Fig. 5.

Shell fusiform, presumably much elongated, both extremities being missing; spire rather low, with an apical angle of about 40° and composed of a few whorls of which four are preserved. Each spire-whorl broad, low, distinctly angulated near the lower suture, the surface above the angle broad, flat, sloped downward; ornamentation consisting of fine longitudinal ribs and transverse ridges besides densely crowded and curved lines of growth. Longitudinal striae on the upper surface number nine, elevated, equal both in strength and distance, and separated by interspaces which are slightly broader than the striae, each with a fine revolving striae; the angle bearing

two strong revolving ribs with a finer riblet between; another fine riblet occurs along the lower suture. Transverse ridges about thirteen on the penultimate whorl, prominent on the angle where they are raised into vertically elongated nodules, but soon fading upwards.

Body whorl long, narrow; the upper surface flat, the periphery roundly angulated at the shoulder, gradually tapering downward into the anterior canal of unknown length. Surface ornamented with transverse ridges and longitudinal ribs; longitudinal ribs narrow, about ten and alternating on the upper surface, three on the shoulder the strongest and with narrow rib in each interspace; those on the base apparently equal in strength and distance, and without an interstitial riblet. Transverse ridges almost confined to the periphery. Aperture and outer lip broken; inner lip presumably excavated; columella straight, apparently smooth.

This species somewhat recalls some forms of *Volutoderma*, especially *Rostellinda*, for example, *V.* (*R.*) *stoliczkana* DALL[1] and *V.* (*R.*) *tenua* DALL[2]. But since there is not trace of the columellar plication and the lines of growth are not sinuate on the upper surface, this form may be generically distinct from those foreign species.

Volutoderma (*Rostellinda*?) sp.[3] from the Cape Khoi group of Russian Saghalien is different from the present form.

Locality and geological horizon: The Ososinai-zawa, a tributary of the Abesinai-gawa, province of Tesio; Upper Ammonites bed.

Pyrifusus, CONRAD.

(*Neptunella*, MEEK.)

Pyrifusus (*Neptunella*) *kawakamiensis* nov.

Pl. XXI (II), Figs. 7, 7a.

Shell fusiform, composed of about five whorls; spire rather low, the sides diverging in an angle of about 45°; sutures distinct; spire-

(1) F. STOLICZKA: Gastr. Cret. Rock Southern India. Op. cit., p. 87, pl. VII, figs. 1, 2, 7. (*Fulguralia elongata*). E. SPENGLER; Nachträge zur Oberenkreidefauna des Trichinopoly-Distriktes in Südindien. Beitr. z. Pal. u. Geol. Osterr.-Ung. u. d. Orients, Vol. XXVI, 1913 pl. XIV, figs. 26; pl. XV, fig. 11.

(2) F. STOLICZKA: Op. cit., pl. VII, fig. 3, 6 (*F. elongata* var. c).

(3) H. YABE and T. NAGAO: New or Little-Known Cretaceous Fossils from North Saghalin (Lamellibranchiata and Gastropoda). Sci. Rep. Tôhoku Imp. Univ., Sec. Ser., Vol. VII, 1925, p. 123, pl. XXIX, figs. 13, 13a, 13b.

whorls broad, roundly shouldered below the midheight, with a somewhat concave and rather steeply sloped upper surface, and ornamented with about thirteen fine revolving striae and about twelve transverse ridges; of the revolving striae eight situated on the upper surface, a strong one on the angle; transverse ridges most pronounced and tubercular on the angle, fading upwards.

Body whorl large, apparently much higher than the spire, roundly angulated at the shoulder with a compressed and slightly concave upper surface and a broadly convex periphery; surface spirally sculptured by numerous fine ribs; three ribs on the periphery, of which the uppermost one is situated on the angle, stronger and furthest apart than the others. Transverse ridges almost confined to the shoulder.

Aperture imperfectly preserved, but presumably long, acutely angulated posteriorly, narrowed anteriorly into an oblique canal of unknown length; inner lip slightly excavated above; columella probably oblique, its border being more or less reflected.

Dimensions:	Height (as preserved)	Breadth
	37 mm.	23 mm.

Since the anterior canal and the outer lip are not well preserved, the generic position of the present species is very uncertain. It is, however, similar to *Pyrifusus* (*Neptunella*) *intertextus* MEEK and HAYDEN[1] from the Upper Cretaceous of North America. *Murex* (*Neptunella*) *ruginosus* WHITE[2] from Brazil is another allied form, being distinguished from ours in having a higher spire and a more abruptly contracted body whorl.

F. SCHMIDT described two species of *Trachytrition*, of which *T. sachalinensis* SCHMIDT[3] is externally somewhat akin to the species under consideration. That species was founded on an imperfect shell and two internal moulds. Some of the specimens have a series of pits preserved on the mould which are thought to represent an internal varix. In our specimen there are observable a few pits on

(1) F. B. MEEK: Rep. Inv. Cret. and Tert. Foss. Up. Miss. Country. Op. cit., p. 348, pl. XIX, fig. 14.

(2) C. A. WHITE: Contrib. to the Paleontology of Brazil; Comprising Descriptions of Cretaceous Invertebrate Fossils, 1888, p. 138, pl. XI, figs. 12, 13.

(3) F. SCHMIDT: Über die Petrefakten der Kreideformation von der Insel Sachalin. Mém. l'Acad. Imp. Sci. St.-Pétersb., Sér. VII, Vol. XIX, 1873, p. 17, ppl. IV, fig. 1; pl. VII, fig. 1.

the mould, but they are very irregular in position and size and hence are not homologous with those pits on the Saghalien species.

Locality and geological horizon: Kawakami district, Toyohara-gun, Saghalien; Upper Ammonites bed.

Piestochilus, MEEK.

Piestochilus laevigatus nov.

Pl. XX(I), Figs. 17, 17a.

Shell moderate in size, long-fusiform; spire high, composed of probably about 10 whorls, of which a few upper ones have been broken away. Each spire-whorl slightly convex, smooth, separated by distinct and canaliculated sutures.

Body whorl large, much higher than the spire, evenly and very broadly convex, somewhat flattened above, rather abruptly narrowed below toward the lower extremity, smooth, being ornamented only with densely crowded, somewhat sinuous lines of growth. Aperture narrow-lanceolate, acute posteriorly, elongated and narrowed anteriorly, terminating in a narrow, long, slightly oblique anterior canal; outer lip injured; inner lip slightly sinuous, being slightly concave posteriorly and subvertical anteriorly; columella straight, vertical, smooth, with a broad and much extended callosity which is rather thin, but thickened posteriorly on the angle of the aperture and extended over the ventral surface of the body whorl.

Dimensions:	Height (as preserved)	Breadth
	75 mm.	21 mm.

The present species may be related to *Piestochilus culbertsoni* MEEK and HAYDEN from the Upper Cretaceous of North America. *Piestochilus* MEEK has one to a few oblique columellar plaits which are not exposed in a direct view into the aperture, and it is ornamented with numerous fine revolving striae all over the surface. The Japanese form under consideration has no indication of the presence of the plait, and may prove to be subgenerically or even generically distinct from that form.

On the other hand, the general outline of this species recalls that of Tertiary *Clavilithes*.

Piestochilus was first placed by MEEK under *Clavilithes* and afterwards considered as a subgenus of *Fasciolaria*, while COSSMANN transferred it into a section of *Cryptorhytis* MEEK.

Locality and geological horizon: Kawakami district, Toyohara-gun, Saghalien; Upper Ammonites bed.

Surculites, CONRAD.

Surculites fusoides nov.

Pl. XXI (II), Figs. 8, 8a.

Shell moderately large, probably with a high spire, the sides diverging at an angle of about 30°. Penultimate whorl slightly broader than high, angulated below the middle of the depth; upper surface faintly concave, the lower one flat, subvertical; the angle ornamented with about thirteen large, prominent, rounded or sometimes vertically compressed tubercles.

Body whorl large, biangulated, the lower angle indistinct, the upper one more pronounced and situated on the shoulder; surface above the upper angle inclined and slightly concave, the interspace between the two angles subvertical and faintly concave; the base gradually narrowed toward the end. Upper angle provided with about fourteen prominent and rounded tubercles, the lower angle bearing a narrow spiral rib, another narrow revolving rib pesent on the upper portion of the base; the surface, moreover, with fine revolving striae all over, and also with densely crowded lines of growth which run from the suture obliquely backward and broadly swing forward on the periphery.

Aperture narrow, elongate with a short oblique anterior canal; outer lip broken; inner lip smooth, faintly excavated above; columella narrow, oblique; callosity apparently thin.

An imperfect specimen without a few upper whorls and the outer lip. There seems to be present a very broad and shallow sulcus, as indicated by the lines of growth, and consequently this form is tentatively included in *Surculites*.

Locality and geological horizon: The Omosirusibetu, a small tributary of the Abesinai-gawa, province of Tesio; Upper Ammonites bed.

---

(1) F. B. MEEK: Report Inv. Cret. and Tert. Foss. Up. Miss. Country. Op. cit. p. 360, pl. XXXII, figs. 1a-f: text-fig. 44.

(2) M. COSSMANN: Ess. Paléont. Comp., Vol. IV, p. 58.

Actaeon, MONTFORT.

Actaeon sachlinensis nov.

Pl. XXII (III), Figs. 6–7b.

Shell small, ovate, composed of five whorls; spire low with a relatively large apical angle; sutures distinct, somewhat appressed. Each spire-whorl slightly convex, broad, ornamented with about eight, crowded, more or less irregularly spaced, punctate and impressed longitudinal lines.

Body whorl large, occupying nearly two-thirds of the total height, with evenly convex sides, and ornamented with fine lines of growth and numerous punctate impressed longitudinal lines, of which about eight or ten lying on the posterior portion are more crowded than the others on the remaining portion of the whorl. Aperture moderately large, posteriorly angulated, anteriorly rounded; outer lip injured, but, as indicated by the impression on the mould, thin and not thickened internally; inner lip excavated and covered with a thin callosity; columella vertical with a plication posteriorly.

Dimensions:	Height	Breadth
	5.5 mm.	3.5 mm.

Two specimens have been examined, both of which are imperfect, the test being largely broken, but preserve many features to enable us to distinguish them some allied forms.

This species differs from *A. polidus* GABB[1] from California, to which it is somewhat akin, in being smaller and in having a broader body whorl with its upper portion ornamented with more numerous crowded longitudinal lines. *A. seminatus* STOL.[2] of the Trichinopoly of Southern India has a more inflated body whorl, and *A. junctus* STOL.[3] of the Utatur is higher, than the present species. Moreover, *A. turriculatus* STOL.[4] of the Trichinopoly is somewhat similar to the new species, but it is distinguished therefrom in being slightly lower and broader. The posterior portion of the body whorl is orna-

(1) W. M. GABB: Paleontology of California, Vol. II, 1896, p. 174, pl. XXVIII, fig. 60. R. B. STEWARTS GABB's California Fossil Type Gastropods. Op. cit., p. 431, pl. XXIV, figs. 18, 19.

(2) F. STOLICZKA: Gastr. Cret. Rock Southern India. Op. cit., p. 416, pl. XXVII, fig. 16; pl. XXVIII, fig. 18.

(3) F. STOLICZKA: Ibid., p. 417, pl. XXVII, fig. 15.

(4) F. STOLICZKA: Ibid., p. 416, pl. XXVII, figs. 10–11; pl. XXVIII, fig. 19.

mented with more numerous crowded longitudinal impressed lines in the present one than that in the Indian form.

Locality and geological horizon: The Nisiho-gawa near the Kawakami Colliery, Toyohara-gun, Saghalien; Upper Ammonites bed.

Avellana, D'ORBIGNY.

Avellana problematica NAGAO.

1932. *Avellana problematica* NAGAO: Some Cretaceous Mollusca from Japanese Saghalin and Hokkaidô (Lamellibrachiata and Gastropoda). This Journal Ser. IV, Vol. II, p. 50, pl. VII, figs. 7, 7a, 7b.

This species was founded on a single specimen from the Abesinai district in the province of Tesio. There are at hand four other specimens obtained from the same district, a place very near the locality of the type specimen. These specimens are a little smaller than the type one. The outer lip is partly broken in the type, while it is rather well represented in some of the newly acquired specimens and is shown to be very thick externally.

Two other imperfect specimens of Avellana have been collected from the province of Isikari, which most probably belong to this same species.

Localities and geological horizon: The Abesinai-gawa, province of Tesio; Upper Ammonites bed. Two specimens referred to from the Sentaro-zawa, Mikasayama-mura, province of Isikari; Upper Ammonites bed?

Oligoptycha, MEEK.

Oligoptycha cf. *obliqua* (GABB)

Pl. XXII (III), Figs. 8, 8a.

Compare:

1864. *Cinulia obliqua* GABB: Paleontology of California, Vol. I, p. 11, pl. XIX, figs. 64, a–c.

1927. *Oligoptycha obliqua* STEWART: GABB's California Fossil Type Gastropods. Op. cit., p. 436, pl. XXIV, fig. 14.

A single imperfect specimen of an *Avellana*-like shell has been collected from Saghalien. It lacks the lower portion of the body whorl but seems very likely to be closely related to or conspecific with *Cinulia obliqua* GABB from California and Canada(1).

(1) J. E. WHITEAVES: Mesozoic Fossils, Vol. I, pt. 2, 1879, p. 131; pt. 5, 1903, p. 354.

Shell small, subglobose, with a depressed spire composed of about three whorls; sutures distinct. Body whorl large, apparently short; outer lip broken, inner lip with a very thick callosity; columella with a prominent and strong tooth, incomplete below. Test thick.

Surface ornamented with numerous narrow deep grooves divided into minute, square compartments by cross-bars; interspaces between the grooves much broader, flat-topped.

Maximum width about 10 mm.

Locality and geological horizon: The Umpei-gawa, Notoro-mura, Rûtaka-gun, Saghalien; Upper Ammonites bed.

In concluding, the writer wishes to express his sincere thanks to Prof. H. YABE of the Institute of Geology and Palaeontology in Sendai for the free use of very extensive literature in his private library.

EXPLANATIONS OF THE PLATES

All figures are of natural size, unless otherwise stated.

Plate XX (I)

Figs. 1–8. *Pugnellus* (*Gymnarus*) *yabei* NAGAO. 1–7, Itinosawa, province of Isikari; 8, Sentaro-zawa, province of Isikari. 1, × 2.

Fig. 9. *Glauconia* (*Gymnentome*) sp. indet. Sentaro-zawa, province of Isikari.

Fig. 10. *Margarites sachalinensis ornatus* NAGAO. Nisiho-gawa near the Kawakami Colliery, Saghalien. × 3.

Figs. 11–13a. *Margarites sachalinensis* NAGAO. Nisiho-gawa, Saghalien. × 3.

Figs. 14–14b. *Ataphrus tesioensis* NAGAO. Abesinai-gawa, province of Tesio. × 2.

Figs. 15–15b. *Margarites* (*Atira*) *depressus* NAGAO. Takinosawa, Saghalien. × 3.

Figs. 16, 16a. *Natica* (*Lunatia*) *denselineata* NAGAO. Umpei-gawa, Uryû, Saghalien.

Figs. 17, 17a. *Piestochilus laevigatus* NAGAO. Kawakami, Saghalien.

Plate XXI (II)

Figs. 1, 1a. *Semifusus* (*Trochofusus*) *saghaliensis* NAGAO. Niitoi-gawa, Saghalien.

Fig. 2. *Dicroloma* (*Perissoptera*) sp. indet. Abesinai-gawa, province of Tesio.

Fig. 3. *Epitonium?* sp. indet. Nisiho-gawa, Kawakami, Saghalien.

Fig. 4. *Cerithium* (s. l.) *isikarense* NAGAO. Asahi-mati, Yûbari-mati, province of Isikari. × 3.

Figs. 5–5b. *Pyropsis* sp. indet. Abesinai-gawa, province of Tesio.

Figs. 6–6b. *Turritella soratiensis* NAGAO. Tomatu-zawa?, province of Isikari. 6b, × 4.

Figs. 7, 7a. *Pyrifusus* (*Neptunella*) *kawakamiensis* NAGAO. Kawakami, Saghalien.

Figs. 8, 8a. *Surculites fusoides* NAGAO. Abesinai-gawa, province of Tesio.

Figs. 9, 9a, 10. *Natica* (*Lunatia*) *ainuana alta* NAGAO. Aton, Saghalien.

Figs. 11–11c. *Natica* (*Lunatia*) *ainuana* NAGAO. Kawakami, Saghalien. 11c, × 3.

Plate XXII (III)

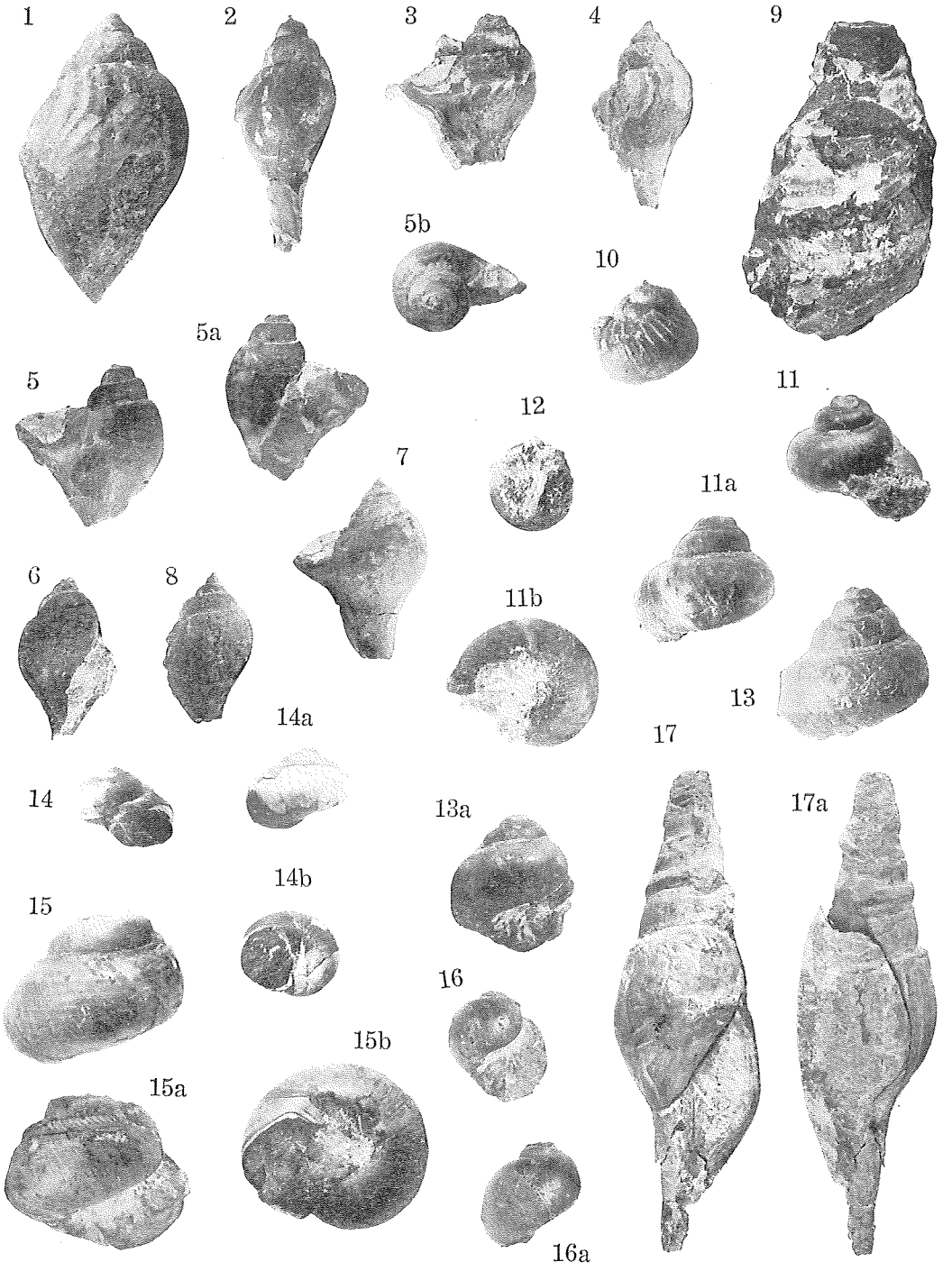
Figs. 1–4. *Semifusus* (*Trochofusus*) *tuberculatus* NAGAO. 1, Nakayama near the Kawakami Colliery, Saghalien; 2, Oku-Kawakami, Saghalien; 4, Hobetu, province of Iburi. 2d, × 2.

Fig. 5. *Fusus* (s. l.) *volutodermoides* NAGAO. Abesinai-gawa, province of Tesio.

Figs. 6–7b. *Actaeon sachalinensis* NAGAO. Nisiho-gawa, Saghalien. × 3.

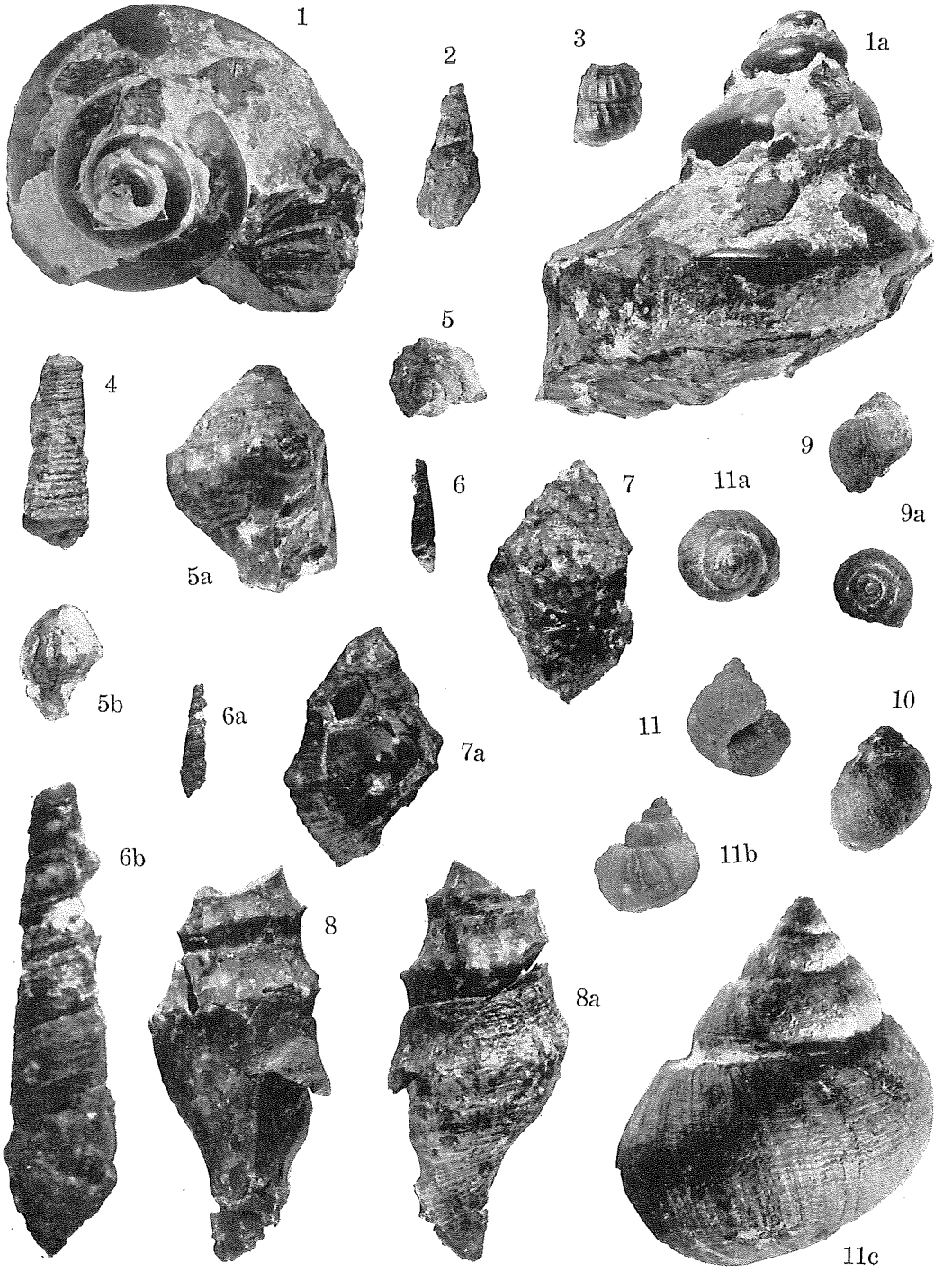
Figs. 8, 8a. *Oligoptycha* cf. *obliqua* (GABB). Umpei-gawa, Notoro, Saghalien. × 2.

Fig. 9. *Tessarolax* cf. *acuticarinatus* NAGAO. Asahi-mati, Yûbari-mati, province of Isikari.



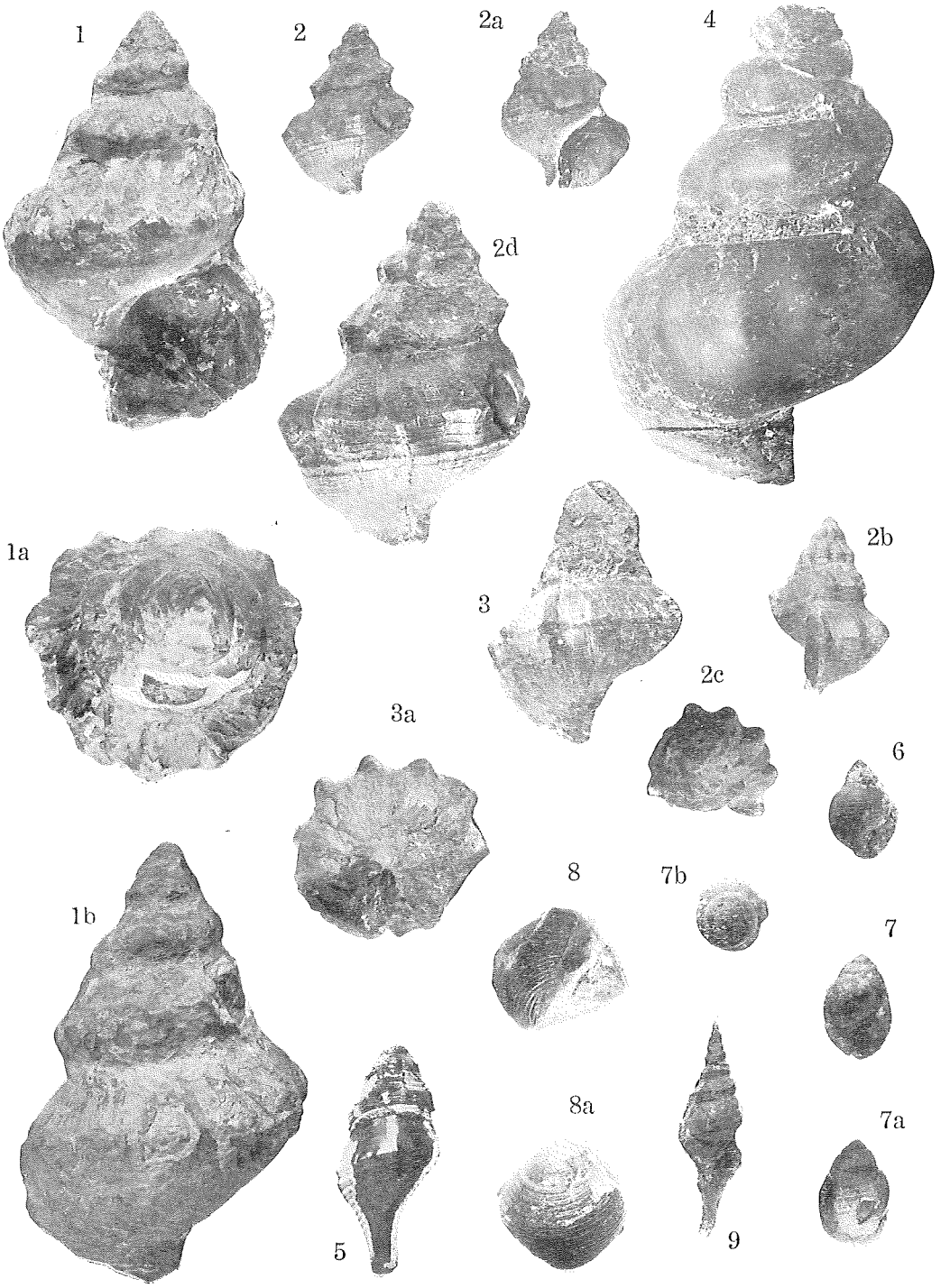
Takeda photo.

T. Nagao: Cretaceous Fossils.



Takeda photo.

T. Nagao: Cretaceous Fossils.



Takeda photo.

T. Nagao : Cretaceous Fossils.