

PALAEONTOLOGICAL SOCIETY OF JAPAN
SPECIAL PAPERS
NUMBER 6

Matajiro YOKOYAMA'S

**TERTIARY FOSSILS FROM VARIOUS
LOCALITIES IN JAPAN**

Part IV.

Revised by
Jirô MAKIYAMA

PUBLISHED BY THE SOCIETY
July 25, 1960

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PALAEOLOGICAL SOCIETY OF JAPAN
c/o Geological Institute, Faculty of Science, University of Tokyo, Japan

Special Papers, Palaeontological Society of Japan

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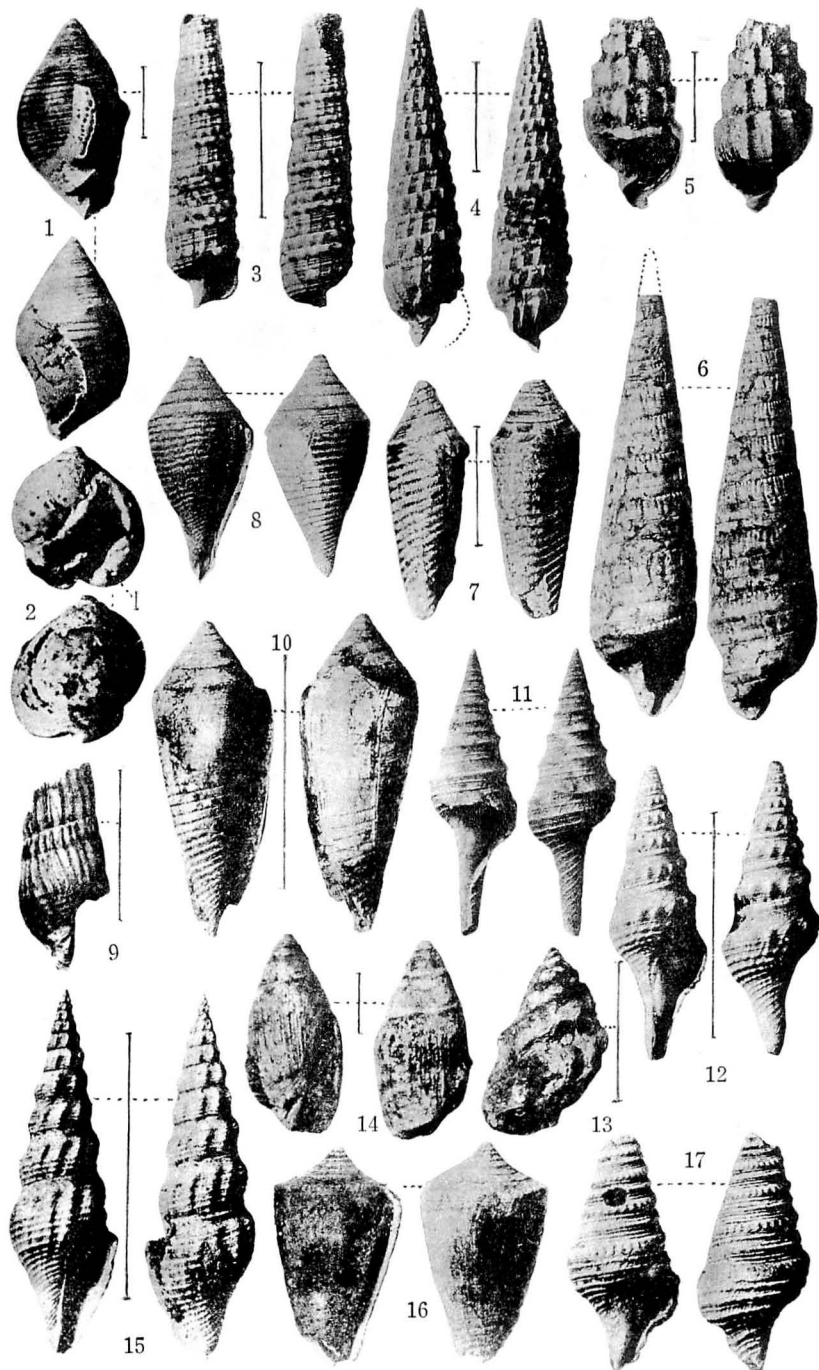
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- XXXVI. Neogene Shells from South Karafto, no. 111, pp. 1-15, with 4
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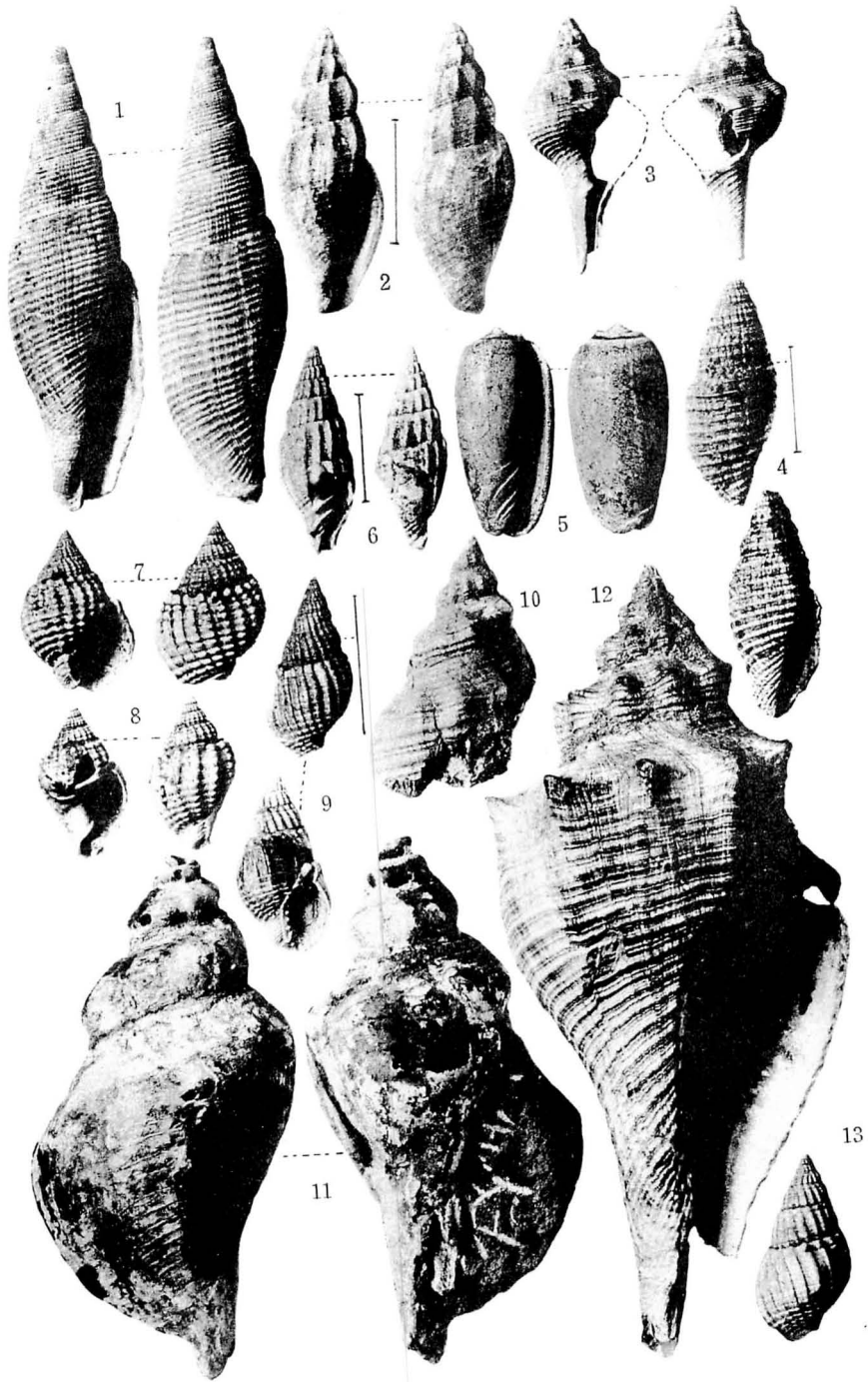
1. *Ringicula foveolata* YOKOYAMA, 1928 (XXXII, 23, n. sp.). Upper Byoritz, Shikô near Kôshun, Takao. **Ringiculospongia foveolata** (YOKOYAMA), HABE, 1950.
2. *Ringicula globulifera* YOKOYAMA, 1928 (XXXII, 24, n. sp.). Lower Byoritz, Wankyô, Tainan. *R. (Ringiculina) globulifera* (YOKOYAMA), HABE, 1950.
3. **Terebra naumanni** YOKOYAMA, 1920, (XXXII, 25). Upper Byoritz, Shikô, Kôshun, Takao. *Myurella (Strioterebrum) naumanni* (YOKOYAMA), T. & O., 1954.
4. **Terebra subvariegata** YOKOYAMA, 1928 (XXXII, 25, n. sp.). Upper Byoritz Beds, Hôtosak, Rinkôshô, Taihoku.
5. *Terebra* sp., (XXXII, 27). Upper Byôritz, Taihanrok, Takao. **Nassarius (Profundinassa) babylonicus** (WATSON, 1886), *vide* KURODA verbally.
6. *Terebra formosana* YOKOYAMA, 1928 (XXXII, 26, n. sp.). Upper Byoritz, Shikô, Kôshun, Takao. **Cerithium fasciatum** BRUGUIÈRE, 1792, KURODA, 1938.
7. *Conus kikaiensis* PILSBRY, 1904, (XXXII, 29). Lower Byoritz; west end of Fukki, Shinchik. *Conus aculeiformis* REEVE, 1844, NOMURA, 1935; **Asprella australis kikaiensis** (PILSBRY, 1904), KURODA, 1955.
8. *Conus sinensis* SOWERBY, 1833 var., (XXXII, 28). Upper Byoritz; Enri Shinchik. not *C. sinensis* GMELIN, 1791; nor *C. sowerbii* REEVE, 1849=*C. sinensis* SOWERBY; **Asprella (Conasprella) cancellata** BRUGUIÈRE, 1792.
9. **Terebra lischkeana** DUNKER, 1877, (XXXII, 24). Lower Byoritz; Injurin, Shinchik. *Myurella (Punctoterebra) lischkeana* (DUNKER) var., T. & O., 1954.
10. *Conus comatosaeformis* YOKOYAMA, 1928 (XXXII, 29, n. sp.). Lower Byoritz; South of Kwan-in San, Taikei Gai, Shinchik. **Asprella australis comatosaeformis** (YOKOYAMA), an ancestor of the HOLTEN's species (1803), *vide* KURODA verbally.
11. *Pleurotoma oxytropis* SOWERBY, 1834, (XXXII, 31). Upper Byoritz; Jônanseikô, Shikoshô, Shinchik. *Polystria leucotropis* (ADAMS and REEVE), auct.; **Turris leucotropis** (ADAMS and REEVE).
12. *Surcula javana* (LINNAEUS, 1758), (XXXII, 33). Upper Byoritz; Shikô, Kôshun, Takao. Not *Turricula javana* (LINNAEUS); **Turricula byorituensis** NOMURA, 1935.
13. *Ocenebra* sp., (XXXII, 42). Upper Arisan; Shokôkô, Tainan. **Ocenebra** sp.
14. **Olivella spretoides** YOKOYAMA, 1922, (XXXII, 35). Upper Byoritz; Hôtosak, Rinkôshô, Taihok.
15. *Drillia pseudoprincipalis* YOKOYAMA, 1920, (XXXII, 32). Upper Byoritz; Kizan, Byôritz Gai, Shinchik. **Clathrodrillia (Pseudoinquisitor) pseudoprincipalis** (YOKOYAMA); *Clavus (Inquisitor) pseudoprincipalis*, a combination suggested by KURODA.
16. **Conus oinouyei** YOKOYAMA, 1928 (XXXII, 30, n. sp.). Lower Byoritz; South of Kwan-in San, Taikei Gai, Shinchik.
17. *Pleurotoma carinata* GRAY, 1834 var. *woodwardi* MARTIN, 1895, (XXXII, 32). Upper Byoritz; Shikô, Kôshun, Takao. *Gemmula granosa woodwardi* (MARTIN). H. & N., 1952; **Turris (Gemmula) granosa** (HELBLING, 1779).



XXXII. Mollusca from the Oil-Field of Taiwan.

PLATE 88.

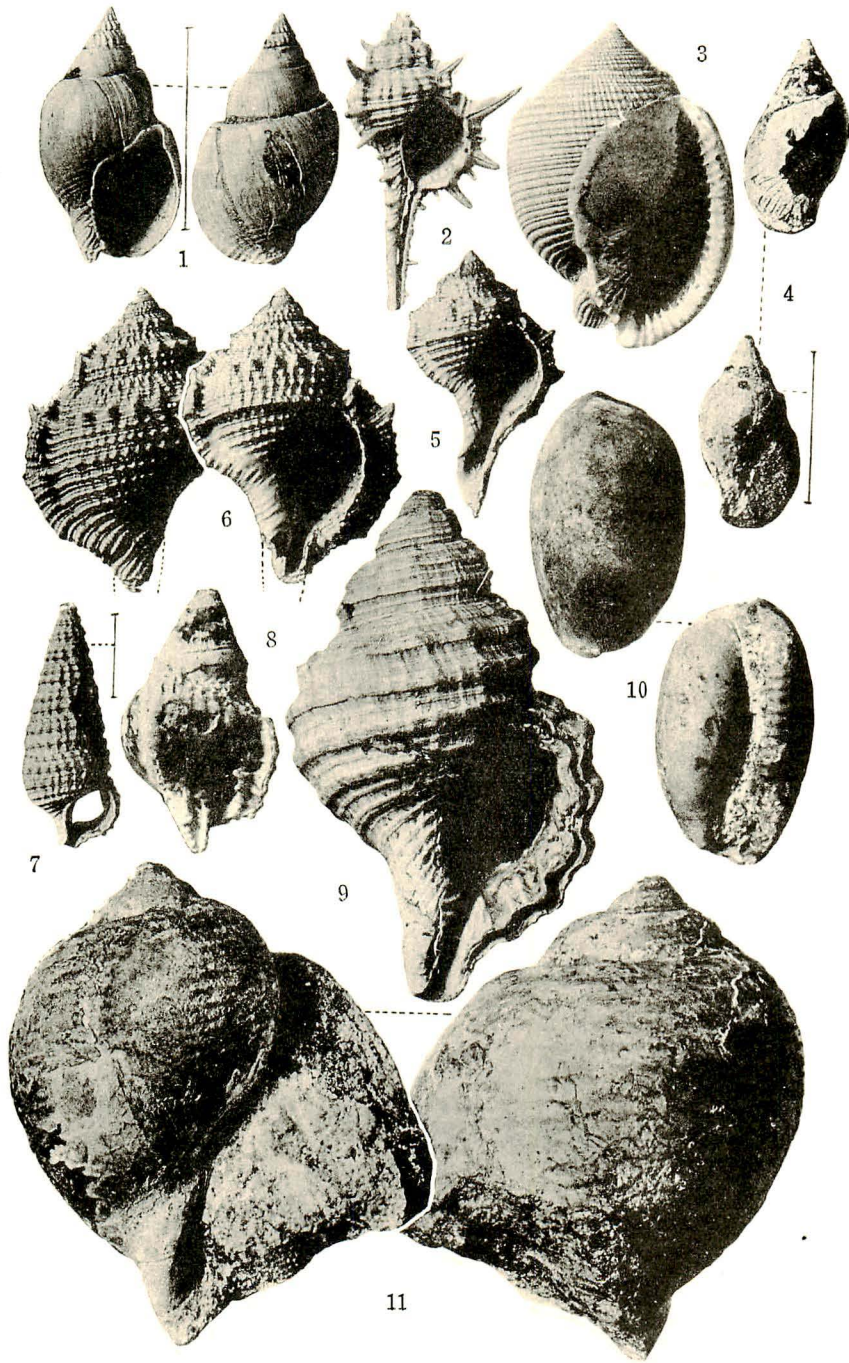
1. *Mitra isabella* SWAINSON, 1833, (XXXII, 35). Upper Byoritz; Shikô, Kôshun, Takao. **Mitra (Scabricola) yokoyamai** NOMURA, 1935.
2. *Mangilia perparva* YOKOYAMA, 1928 (XXXII, 33, n. sp.). Upper Byoritz; Shikô, Kôshun, Takao. *Mangilia perparva*, NOMURA, 1935; **Etremella perparva** (YOKOYAMA).
3. *Fasciolaria iizukai* YOKOYAMA, 1928 (XXXII, 37, n. sp.). Upper Byoritz; Shikô, Kôshun, Takao. *Tudicla cumingii* (JONAS), NOMURA, 1935, JONAS *nom. nud.*; **Tudicla cumingii** (REEVE, 1848).
4. *Mitra sphaerulata* MARTIN, 1784, (XXXII, 36). Upper Byoritz; Kyushôkô, Enrishô, Shinchik. **Mitra (Scabricora) papilio** (LINK, 1807).
5. *Oliva mustellina* LAMARCK, 1844, (XXXII, 34). Upper Byoritz; Kwashôhei, Shikoshô, Shinchik. **Oliva mustelina** LAMARCK.
6. *Mitra gembacana* MARTIN, 1887, (XXXII, 37). Lower Byoritz; Nijûkei, Tombokôkei, Tainan. *Vexillum (Pusia) gembacanum* (MARTIN), NOMURA, 1935; **Pusia gembacana** (MARTIN).
7. *Nassa (Niotha) gemmulata* (LAMARCK, 1822), (XXXII, 40). Upper Byoritz; Goko, Shikôshô, Shinchik. *Nassarius gemmulatus*, NOMURA, 1935; **Nassarius clathratus** (LAMARCK, 1822), IREDALE, 1929.
8. *Nassa gemmulata* (LAMARCK), var. Upper Byoritz; Shikô, Kôshun, Takao. See above.
- 9, 10. *Nassa (Hima) verbeeki* MARTIN, 1906, (XXXII, 40). Upper Byôritz; Jônanseikô, Shinchik. *Nassarius (Zeuxis) caelatus* (ADAMS, 1851), NOMURA, 1935; **Nassarius caelatus** (ADAMS).
- 10, 11. *Siphonalia kellettioides* YOKOYAMA, 1928 (XXXII, 39, n. sp.). Lower Byoritz; 10: Banbakôkei, Shinchik; 11: Takao, Shinchik. **Hemifusus kellettioides** (YOKOYAMA), *fide* KURODA.
12. *Hemifusus ternatanus* (GMELIN, 1790), (XXXII, 38). Upper Byoritz; between Hakshaton and Futôkôbi, Shinchik. *Hemifusus colosseus* (LAMARCK, 1822), NOMURA, 1935; cf. **Hemifusus tuba** (GMELIN, 1790), see Pt. II, pl. 55, f. 1, *fide* KURODA verbally.



XXXII. Mollusca from the Oil-Field of Taiwan.

PLATE 89.

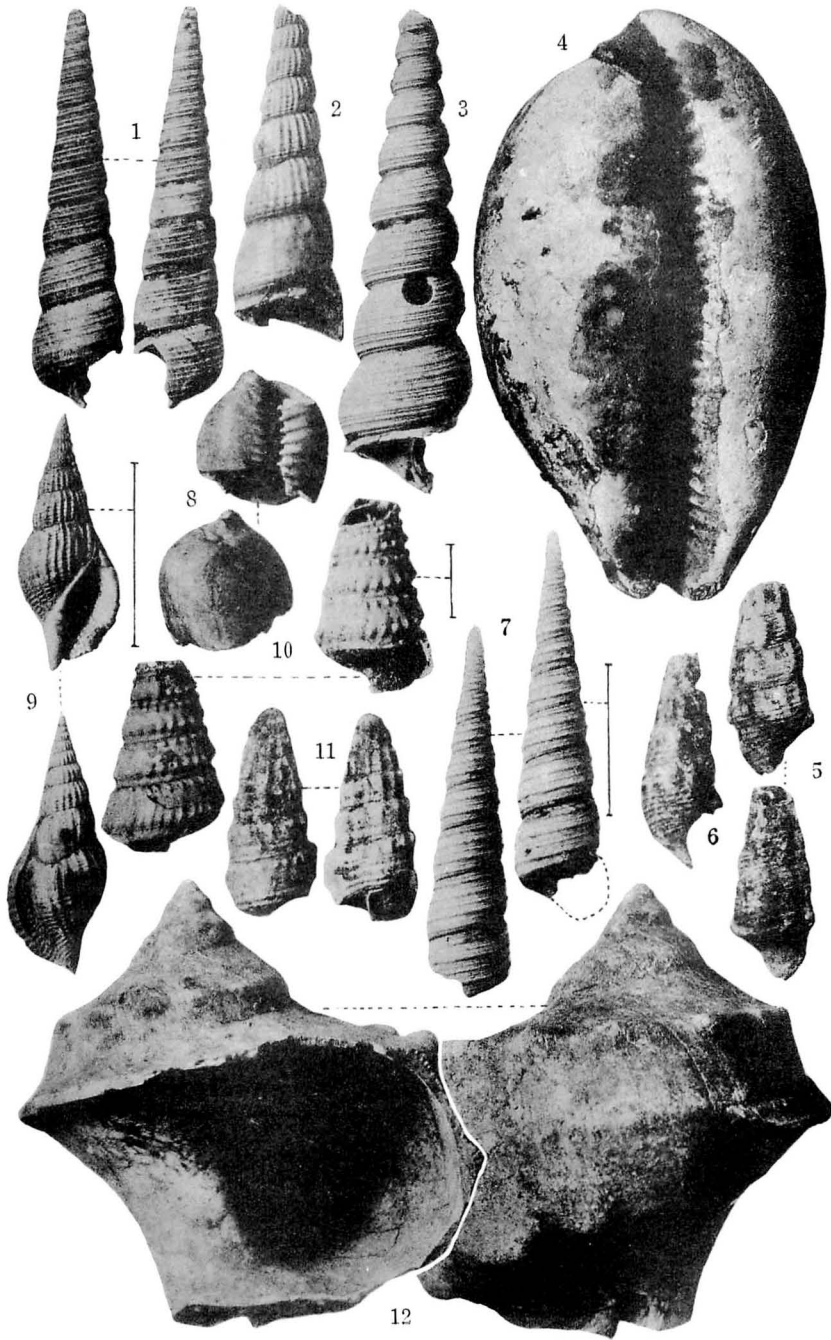
1. *Nassa (Zeuxis) canaliculata* LAMARCK, 1799, (XXXII, 41). Upper Byoritz; Shikô, Kôshun, Takao. *Nassarius dorsatus* [RÖDING], 1798; *Nassarius (Alectrion) canaliculatus* (LAMARCK, 1822), NOMURA, 1935.
2. *Murex ternispina* LAMARCK, 1822, (XXXII, 42). Upper Byoritz; Shikô, Kôshun, Takao. **Murex tribulus** LINNAEUS, 1758, NOMURA, 1935; = *M. ternispina* ?
3. *Cassis japonica* REEVE, 1848, (XXXII, 46). Upper Byoritz; Shikô, Kôshun, Takao. *Phalium (Semicassis) japonicum* (REEVE, 1844), NOMURA, 1935; **Semicassis japonica** (REEVE, 1848).
4. *Cassis gracilentia* YOKOYAMA, 1928 (XXXII, 46, n. sp.). Lower Byoritz; Intôshi, Shinchik. **Semicassis gracilentia** (YOKOYAMA).
- 5, 6. *Gyrineum scelestum* YOKOYAMA, 1928 (XXXII, 44, n. sp.). Upper Byoritz; 5: Goko, Shikôshô, Shinchik; 6: Nankwa, Shinchik. **Bursa rana subgranosa** (BECK, 1841), NOMURA, 1935; *Bursa rana* (LINNAEUS, 1758) var., KURODA, 1938.
7. **Cerithium satoi** YOKOYAMA, 1928 (XXXII, 51, n. sp.). Upper Byoritz; Shikô, Kôshun, Takao. *Gourmya satoi* (YOKOYAMA), NOMURA, 1935.
8. *Distortio cancellinus* (ROISSY), (XXXII, 44). Upper Byoritz; Shikô, Kôshun, Takao. *Murex cancellinus* LAMARCK, 1803; **Distorsio reticulata** [RÖDING], 1798.
9. *Triton (Simpulum) costatus* (BORN, 1780), (XXXII, 43). Upper Byoritz; Shikô, Kôshun, Takao. *Cymatium parthenopeum* (SALIS, 1773), NOMURA, 1935; **Cymatium echo** KURODA & HABA, 1950.
10. *Cypraea cinctoides* YOKOYAMA, 1928 (XXXII, 48, n. sp.). Lower Byoritz; Babukutz, Taitô. **Erronea cinctoides** (YOKOYAMA).
11. *Dolium olearium* BRUGUIÈRE, (XXXII, 47). Upper Byoritz; Babukutz, Taitô. *Tonna zonata* (GREEN, 1830), NOMURA, 1935; **Tonna olearium** (LINNAEUS, 1758) *vide* KURODA.



XXXII. Mollusca from the Oil-Field of Taiwan.

PLATE 90.

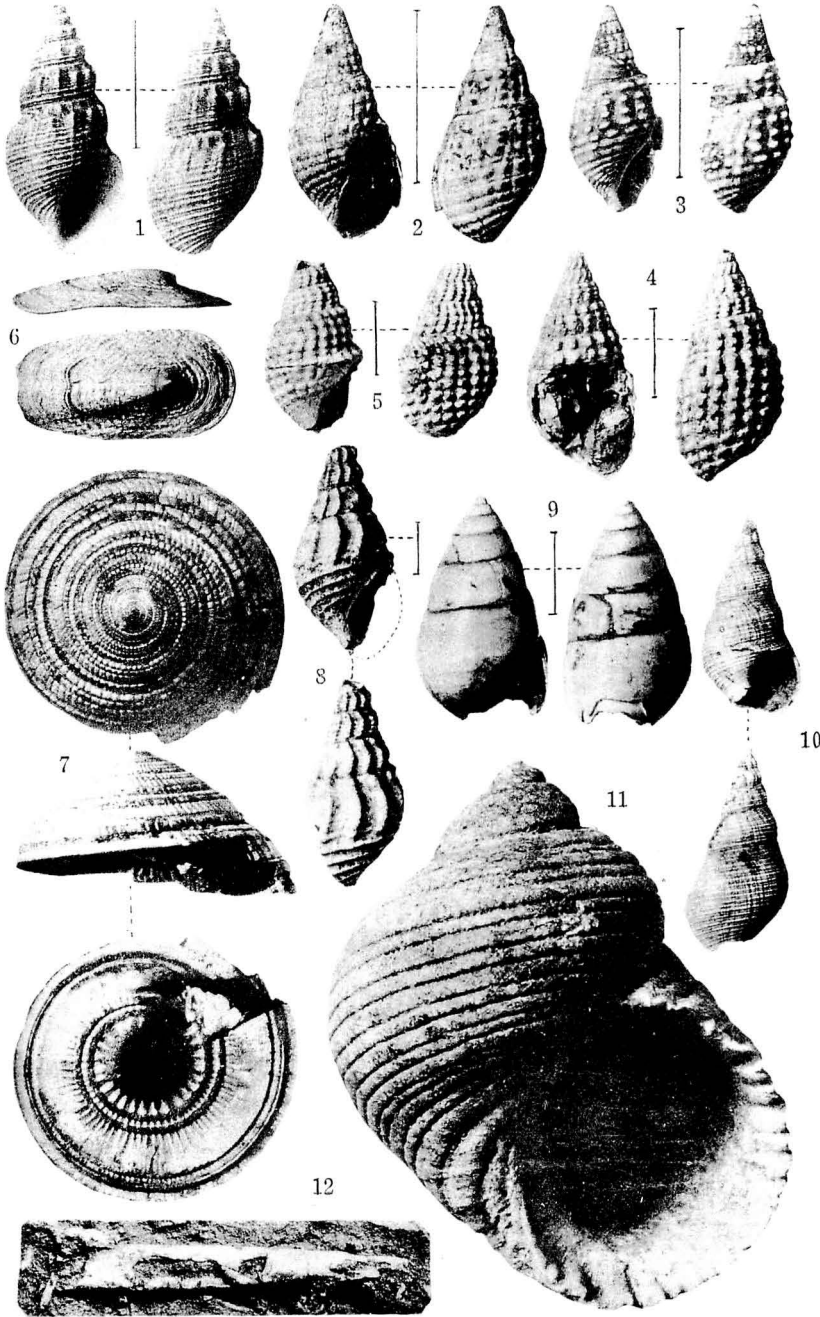
1. **Turritella bacillum** KIENER, 1844, (XXXII, 56). Lower Byoritz; Roksô, Tainan (exl. pl. 4); Sôrok, Zenkwa, Tainan (text p. 56). **Turritella terebra** (LINNAEUS, 1758), NOMURA, 1935.
2. *Rostellaria* sp., (XXXII, 51). Upper Byoritz; Jôwan, Shikoshô, Shinchik. **Tibia fusus** (LINNAEUS, 1758), NOMURA, 1935.
3. **Turritella terebra** LINNAEUS, 1758, (XXXII, 56). Lower Byoritz; Rokujûkei, Kakshashô, Tainan.
4. *Cypraea carneola* LINNAEUS, 1758, (XXXII, 48). Upper Byoritz; Kontei, Kôshun, Takao. **Cypraea (Lyncina) vitellus** LINNAEUS, 1758.
- 5, 6. *Potamides (Batillaria) murayamai* YOKOYAMA, 1928 (XXXII, 53, n. sp.). 5: Lower Byoritz; Kwan-in San, Shinchik; 6: Upper Byoritz; Jôwan, Shikoshô, Shinchik. *Batillaria zonalis* (BRUGIÈRE, 1792), NOMURA, 1935; **Batillaria murayamai** YOKOYAMA.
7. **Turritella filiola** YOKOYAMA, 1928 (XXXII, 57, n. sp.). Upper Byoritz: Kizan, Byoritz Gai, Shinchik.
8. *Cypraea* sp., (XXXII, 49). Upper Byoritz; Hôtosak, Rinkô-shô, Taihok. cf. *Erosaria erosa* LINNAEUS, 1758.
9. *Rostellaria (Rimella) spinifera* MARTIN, 1906 var. *formosana* YOKOYAMA, 1928 (XXXII, 50). Upper Byoritz; Jôwan, Shikoshô, Shinchik. **Tibia formosana** (YOKOYAMA, 1928), NOMURA, 1935.
10. *Cerithiopsis?* *shikoensis* YOKOYAMA, 1928 (XXXII, 55, n. sp.). Upper Byoritz; Shikô, Kôshun, Takao. **Trochocerithium shikoense** (YOKOYAMA), NOMURA, 1935.
11. *Potamides muritus* YOKOYAMA, 1928 (XXXII, 53, n. sp.). Lower Byoritz; between Sekibyô and Rokujûkei, Tainan. **Contumax lifuensis muritus** (YOKOYAMA), KURODA, 1952.
12. *Turbo marmoratus* LINNAEUS, 1758 var. *laevis* YOKOYAMA, 1928 (XXXII, 65). Upper Byoritz; Kontei, Takao. **Turbo marmoratus** LINNAEUS, 1758.



XXXII. Mollusca from the Oil-Field of Taiwan.

PLATE 91.

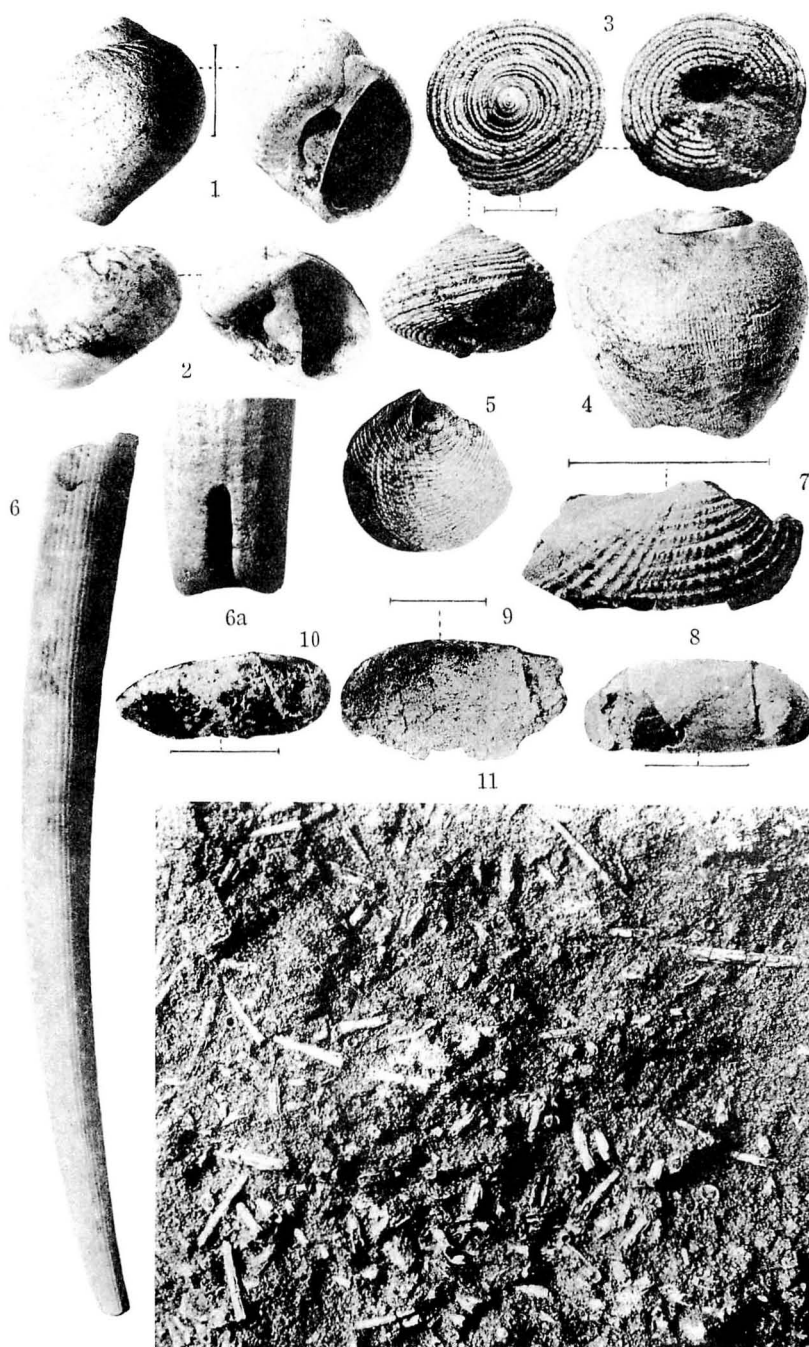
1. *Melania scabroides* YOKOYAMA, 1928 (XXXII, 58, n. sp.). Upper Byoritz; Shikô, Kôshun, Takao. **Melanoides scabra** (MÜLLER, 1774), KURODA, 1938.
- 2, 3, 4, 5. *Melania submandiunensis* YOKOYAMA, 1928, (XXXII, 59, n. sp.). Lower Byoritz; 2, 3; between Rokujûkei and Sekibyô, Tainan (expl. pl. 5), Nijûkei, Tainan (p. 59); 4, 5: the upper course of the Nairin, Tainan. **Melanoides obliquigranosus** (SMITH, 1878), *vide* KURODA.
6. *Scutus unguis* (LINNAEUS, 1758), (XXXII, 67). Upper Byoritz; Kizan, Byoritz Gai, Shinchik. **Scutus sinensis** (BLAINVILLE, 1825).
7. *Solarium perspectivum* LINNAEUS, 1758, (XXXII, 62). Upper Byoritz; Jônanseikô, Shikoshô, Shinchik. **Architectonica perspectiva** (LINNAEUS).
8. *Melania grossula* YOKOYAMA, 1928 (XXXII, 61, n. sp.). Lower Byoritz; upper course of the Nairin, Tainan. **Melanoides grossula** (YOKOYAMA), NOMURA, 1935.
9. *Melania glabelliuscula* YOKOYAMA, 1928 (XXXII, 61, n. sp.). Upper Byoritz; Shikô, Kôshun, Takao. **Melanoides glabelliusculus** (YOKOYAMA),
10. *Melania saigoï* YOKOYAMA, 1928 (XXXII, 60, n. sp.). Upper Byoritz; Shikô, Kôshun, Takao. **Melanoides saigoï** (YOKOYAMA).
11. *Turbo (Senectus) argyrostomus* LINNAEUS, 1758 var. *margaritacea* LINNAEUS, (XXXII, 65). Upper Byoritz; Kontei, Takao. **Turbo setosus** GMELIN, 1790, KURODA, 1938.
12. See pl. 92, f. 6. **Dentalium (Fissidentalium) vernedei** SOWERBY, 1860. Lower Byoritz; Yaryûkô, Banrishô, Taihok.



XXXII. Mollusca from the Oil-Field of Taiwan.

PLATE 92.

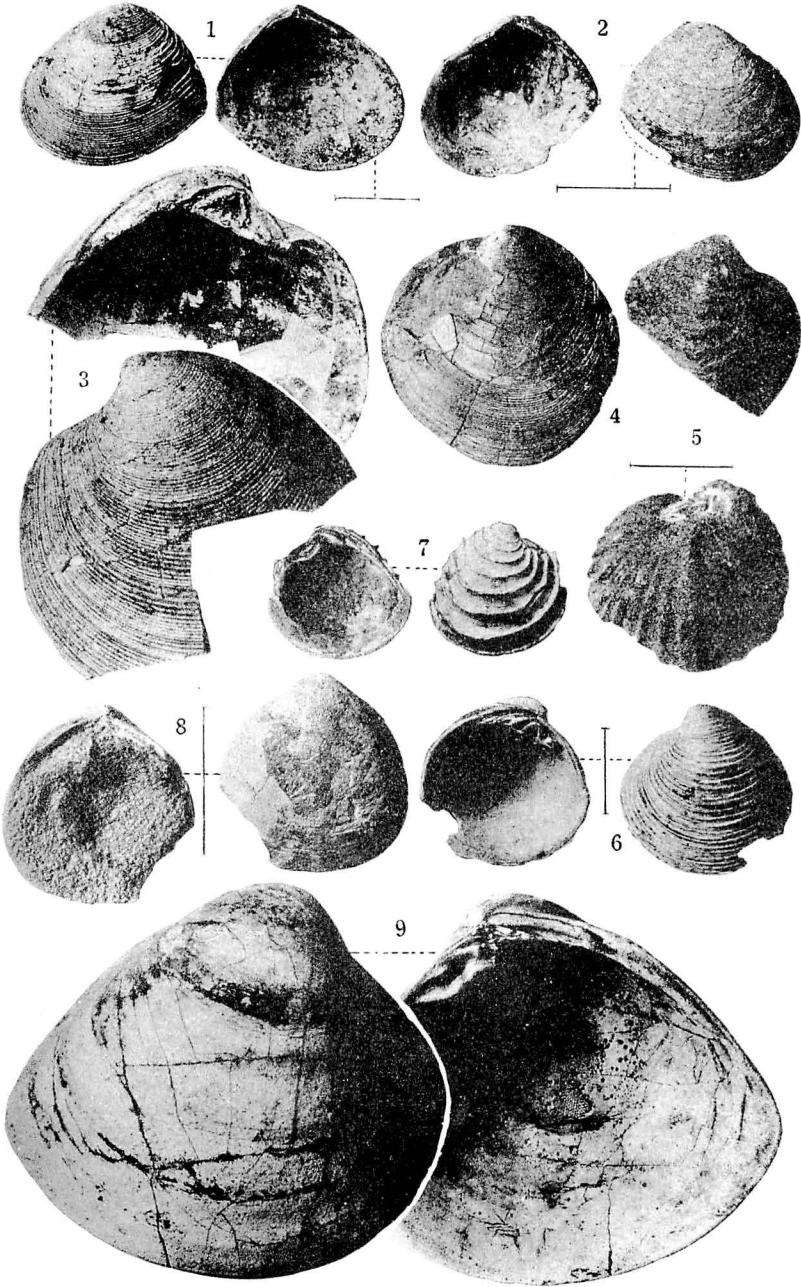
1. *Natica colliei* RÉCLUZ, 1875, (XXXII, 63). Upper Byoritz; Shikô, Kôshun, Takao. **Natica alapapilionis** [RÖDING], 1798.
2. *Polinices sagamiensis* PILSBRY, 1904, (XXXII, 63). Upper Byoritz; Kyushôkô, Enrishô, Shinchik. **Polinices columnalis** (RÉCLUZ, 1851), NOMURA, 1935.
3. *Gibbula* ? *tainanica* YOKOYAMA, 1928 (XXXII, 66, n. sp.). Lower Byoritz; Nijûkei, Tainan. **Gibbula tainanica** YOKOYAMA.
4. *Pyrula taiwanica* YOKOYAMA, 1928 (XXXII, 47, n. sp.). Lower Arisan; Hagioka, Shinchik. **Ficus taiwanica** (YOKOYAMA).
5. *Sigaretus undulatus* LISCHKE, 1872, (XXXII, 64). Upper Byoritz; Jônanseikô, Shikoshô, Shinchik. **Sinum undulatum** (LISCHKE).
6. *Dentalium vernedei* HANLEY, (XXXII, 68). Upper Byoritz; Shikô, Kôshun, Takao; 6a: apex enlarged. **Dentalium (Fissidentalium) vernedei** SOWERBY, 1860. cf. pl. 91, f. 12: Lower Byoritz example.
7. *Pholas* sp., (XXXII, 70). Upper Byoritz; Ubikô, Tsûshôshô, Shinchik. **Barnea (Umitake) japonica** (YOKOYAMA, 1920).
- 8, 9, 10. **Siliqua intoshiana** YOKOYAMA, 1928 (XXXII, 72, n. sp.). Lower Byoritz; Intôshi, Shinchik.
11. **Dentalium subrectum** JEFFREYS, 1882, (XXXII, 69). Lower Byoritz; Yaryukô, Banrishô, Taihok.



XXXII. Mollusca from the Oil-Field of Taiwan.

PLATE 93.

- 1, 2. **Tellina taiwanica** YOKOYAMA, 1928 (XXXII, 73, n. sp.). Upper Byoritz; Tenshi, Shikoshô, Shinchik.
3. **Dosinia gruneri** (PHILIPPI, 1847), (XXXII, 74). Upper Byoritz; Shûtô, Sankyakusui, Enrishô, Shinchik.
4. **Dosinia angulosa** (PHILIPPI, 1847), (XXXII, 75). Lower Byoritz; Bansha, Tainan.
5. **Clementia** sp., (XXXII, 79). Upper Arisan; Tairôkei, Arisan, Tainan.
6. **Meretrix indecoroides** YOKOYAMA, 1928 (XXXII, 76, n. sp.). Lower Byoritz; Nankô, Kôzanshô, Shinchik. **Pitar indecoroides** (YOKOYAMA), NOMURA, 1933, K. & H., 1952.
7. **Chione foliacea** (PHILIPPI, 1846), (XXXII, 80). Lower Byoritz; Nankô, Kôzanshô, Shinchik. **Venus (Chione) tiara** DILLWYN, 1817, NOMURA, 1933; **Chione tiara** (DILLWYN, 1817), K. & H., 1952.
8. **Mactra banbakoensis** YOKOYAMA, 1928 (XXXII, 71, n. sp.). Lower Byoritz; (Upper Byoritz in expl. pl. VII, f. 8); mouth of the Banbakôkei, Shinchik.
9. **Meretrix meretrix** (LINNAEUS, 1758), (XXXII, 75). Upper Byoritz; Jônanseikô, Shikôshô, Shinchik.



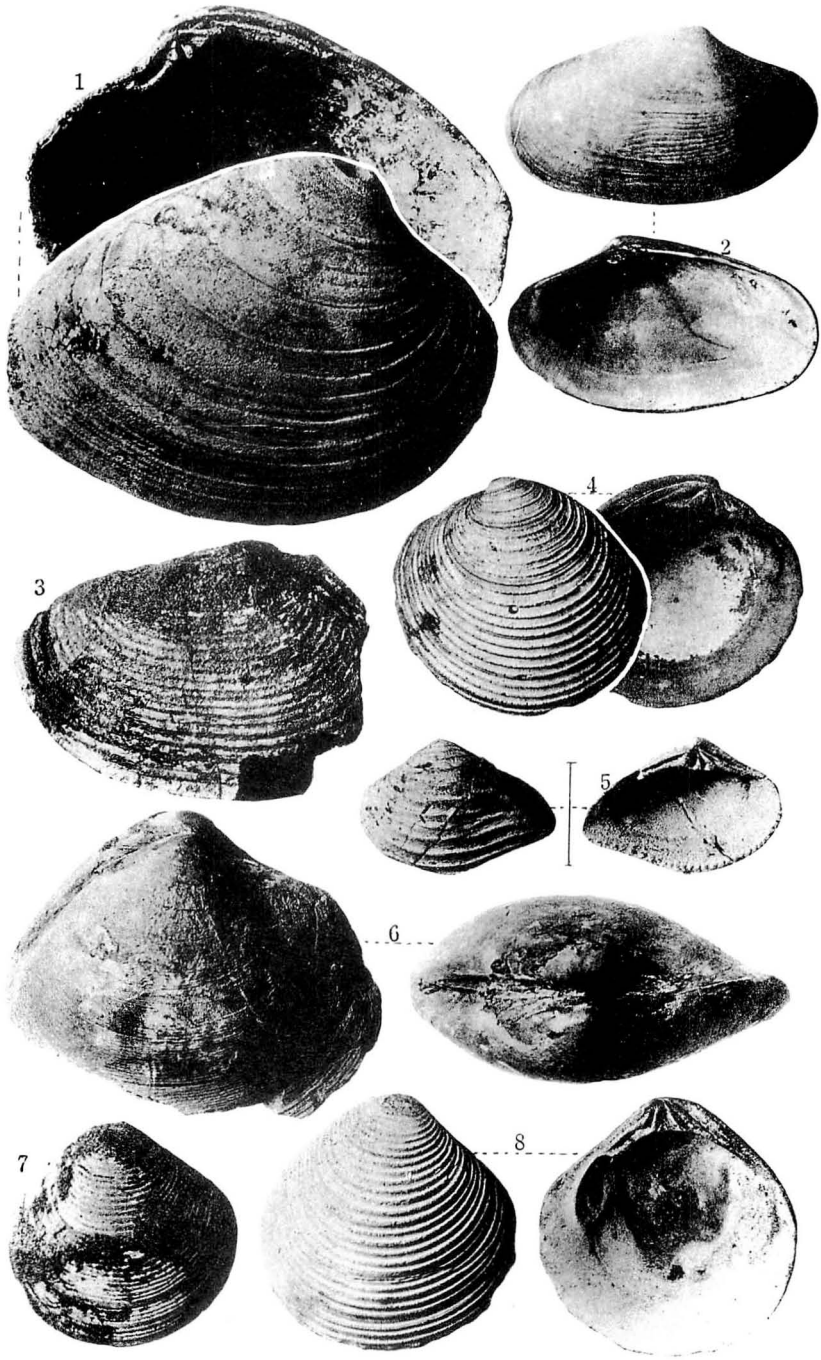
XXXII. Mollusca from the Oil-Field of Taiwan.

PLATE 94.

1. *Meretrix (Macrocallista) ezoensis* (YOKOYAMA, 1889), (XXXII, 77). Upper Byoritz; Enri, Shinchik. *Macrocallista pacifica* (DILLWYN, 1817), NOMURA, 1933; *Callista chinensis* (HOLTEN, 1803)*.
2. *Tapes undulatus* (BORN, 1780), (XXXII, 82). Upper Byoritz; Shikô, Kôshun, Takao. *Paphia (Paphia) undulata* (BORN, 1778), NOMURA, 1933; *Paphia (Paratapes) undulata* (BORN).
3. *Tapes* sp., (XXXII, 82). Lower Byoritz; Katôkô, Rôdenryôshô, Shinchik. *Paphia* sp., aff. *P. amabilis* (PHILIPPI, 1848).
4. *Chione casinaeformis* YOKOYAMA, 1926, (XXXII, 79). Upper Byoritz; Shikô, Kôshun, Takao. *Venus (Antigona) foveolata* SOWERBY, 1835, NOMURA, 1933; *Ventricoloidea foveolata* (SOWERBY, 1853), see Pt. II, pl. 51, f. 7.
5. *Cryptogramma kanearai* YOKOYAMA, 1928 (XXXII, 80, n. sp.). Upper Byoritz, Sankô, Injurin, Shinchik. *Crassatellites sulcatus* (LAMARCK, 1819), NOMURA, 1933; *Crassatellites foveolatus* (SOWERBY, 1870).
6. *Venus? arisanensis* YOKOYAMA, 1928 (XXXII, 79, n. sp.). Lower Arisan; east of Sachihara, Shinchik.
7. 8. *Circe scripta* (LINNAEUS, 1758), (XXXII, 81). 7: Lower Byoritz; Injurin, Shinchik; 8: Upper Byoritz; Shikô, Kôshun, Takao. *Circe stutzeri* (DONOVAN, 1834).

Remarks

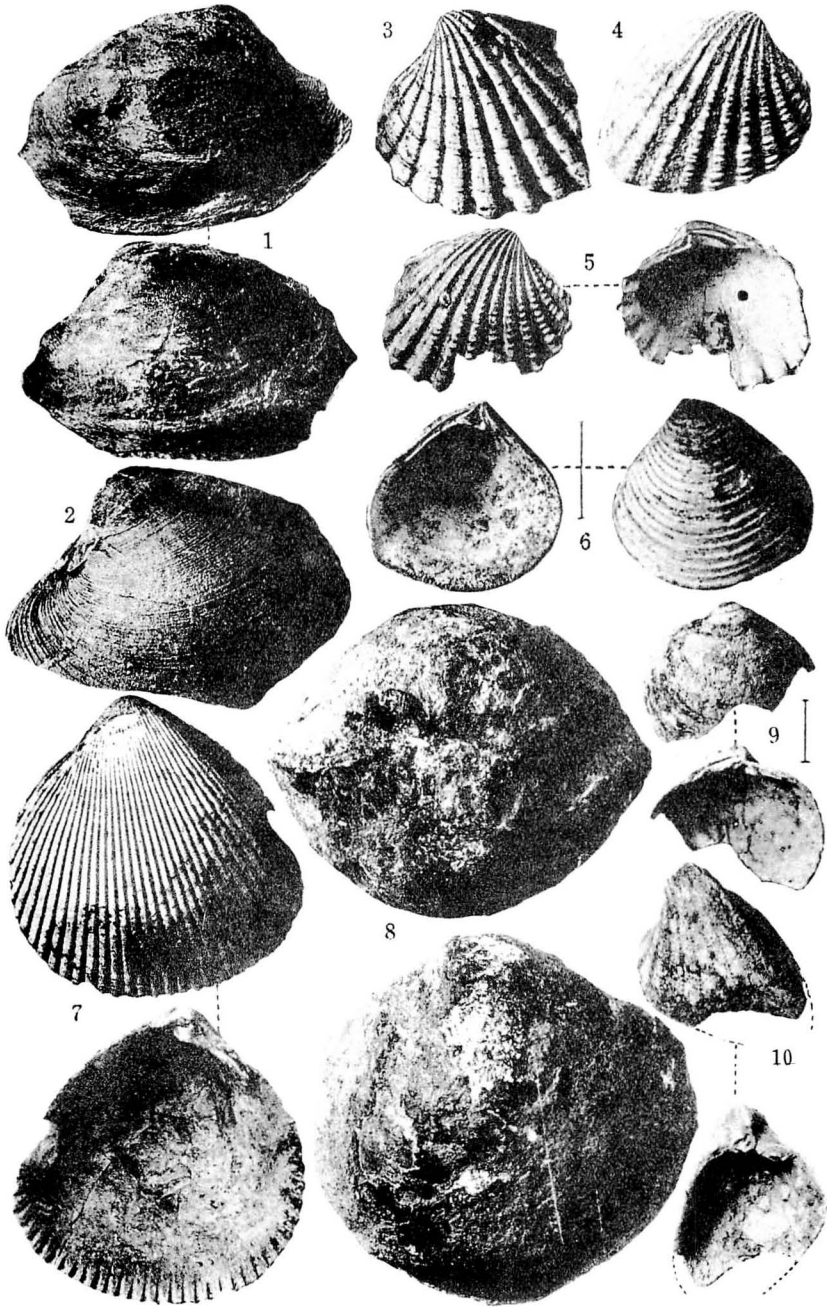
* *Callista ezoensis* (YOKOYAMA, 1889) originally *Tapes ezoensis* (mixed in the Cretaceous specimens) was thought as a senior subjective synonym of *Callista chishimana* PILSBRY, 1905 by YOKOYAMA, but *C. brevisiphonata* CARPENTER, 1865 is still older. The Formosan and South Japonic form is *Callista chienensis* HOLTEN, 1803.



XXXII. Mollusca from the Oil-Field of Taiwan.

PLATE 95.

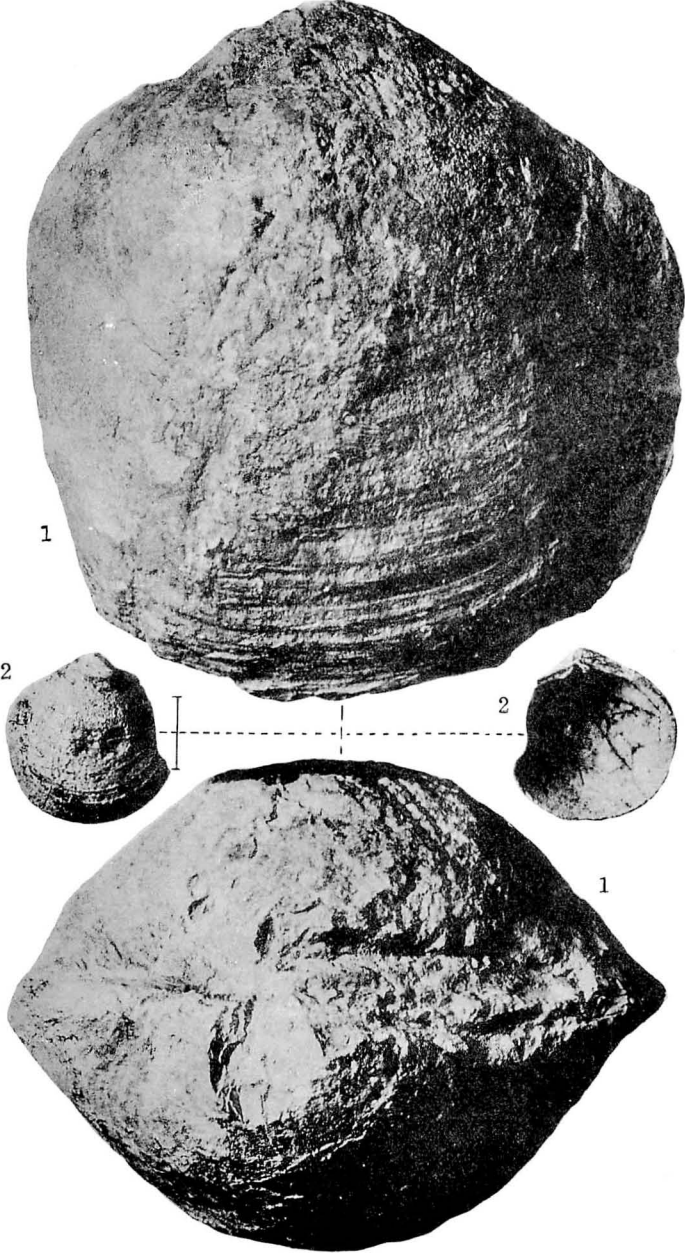
- 1, 2. *Tapes? taiwanensis* YOKOYAMA, 1928 (XXXII, 82, n. sp.). 1: Lower Arisan; south of Kizan, Taihok; 2: Lower Arisan; Usekkôkei, Taichû. **Paphia taiwanensis** (YOKOYAMA).
- 3, 4, 5. *Venericardia cipangoana*, YOKOYAMA, 1920, (XXXII, 86). Upper Byoritz.
Wide-ribbed variety: f. 3, Shûtô, Sankyaksui, Shinchik.
Narrow ribbed variety: f. 4, Tenshi, Shikoshô, Shinchik.
Medium ribbed variety: f. 5, Nankô, Kôzanshô, Shinchik.
Venericardia granulicosta NOMURA, 1933.
6. *Astarte sulcata* DACOSTA, 1778, (XXXII, 88). Upper Byoritz; Jôwan, Shikoshô, Shinchik.
Crassatellites loebbeckei (KOBELT, 1886), NOMURA, 1933.
7. *Cardium burchardi* DUNKER, 1877, (XXXII, 84). Upper Byoritz; Tenshi, Shikoshô, Shinchik. **Trachycardium burchardi** (DUNKER), see Pt. II, pl. 37, f. 3.
8. **Loripes goliath** YOKOYAMA, 1928 (XXXII, 86, n. sp.). Upper Arisan; a branch stream of the river Fûkô, Takao. *Anodontia?* NOMURA, 1933.
9. **Diplodonta murayamai** YOKOYAMA, 1928 (XXXII, 85, n. sp.). Upper Byoritz; Denshinshi, Shikoshô, Shinchik. *Taras murayamai*, NOMURA, 1933.
10. *Hemicardium hemicardium* (LINNAEUS, 1758), (XXXII, 84). Lower Byoritz; Rokujûkei, Hakshashô, Tainan. **Fragum hemicardium** (LINNAEUS).



XXXII. Mollusca from the Oil-Field of Taiwan.

PLATE 96.

1. *Loripes goliath* YOKOYAMA, 1928, see pl. 95, f. 8, $\times 2/3$. Upper Arisan; Kôsen, Takao.
2. *Diplodonta murayamai* YOKOYAMA, 1928, see pl. 95, f. 9. Upper Byoritz; Denshinshi, Shikoshô, Shinchik.

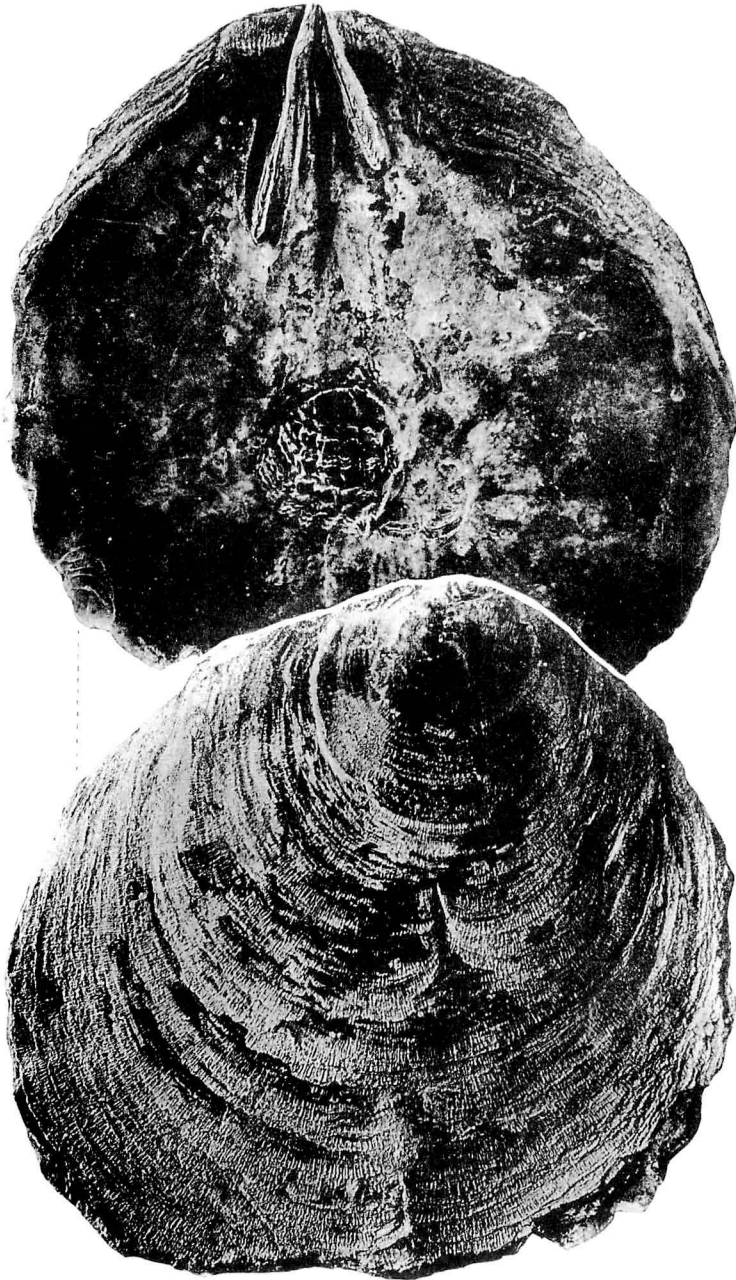


XXXII. Mollusca from the Oil-Field of Taiwan.

PLATE 97.

Placenta placenta (LINNAEUS, 1758), (XXXII, 92). Left valve. Lower Byoritz; Usantô, Tainan.

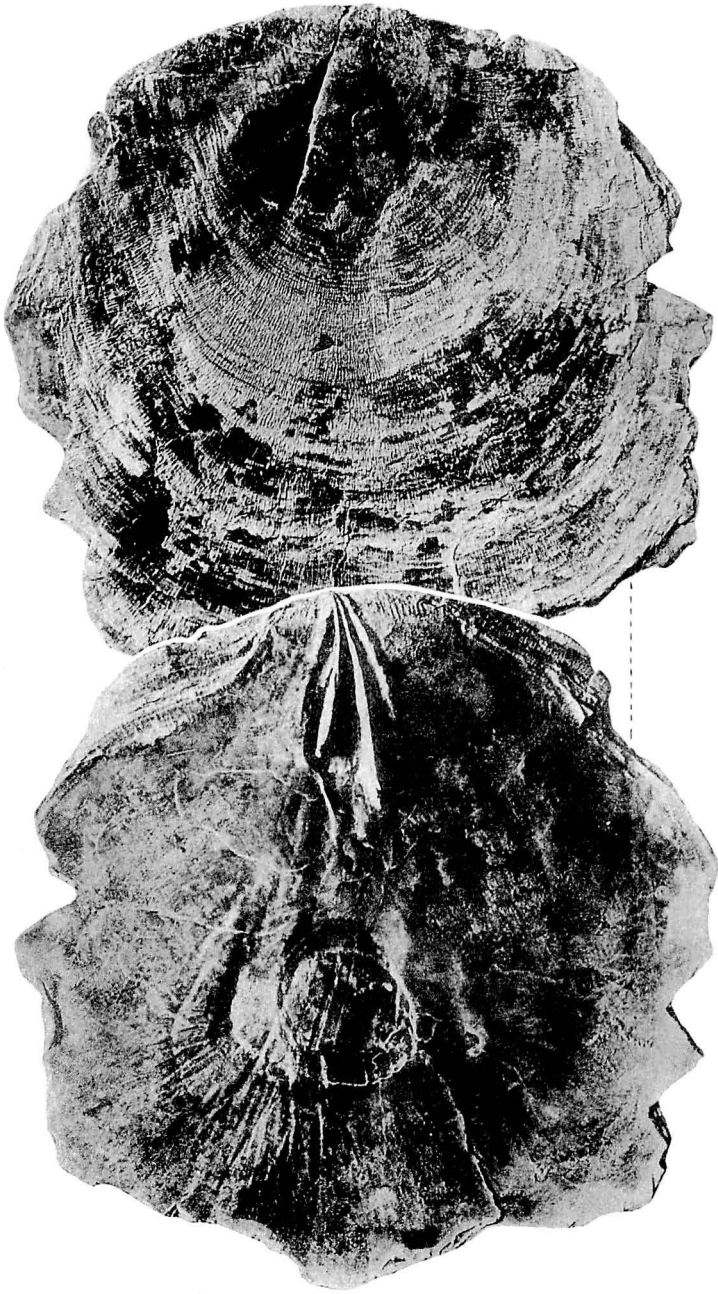
Placuna placenta (LINNAEUS).



XXXII. Mollusca from the Oil-Field of Taiwan.

PLATE 98.

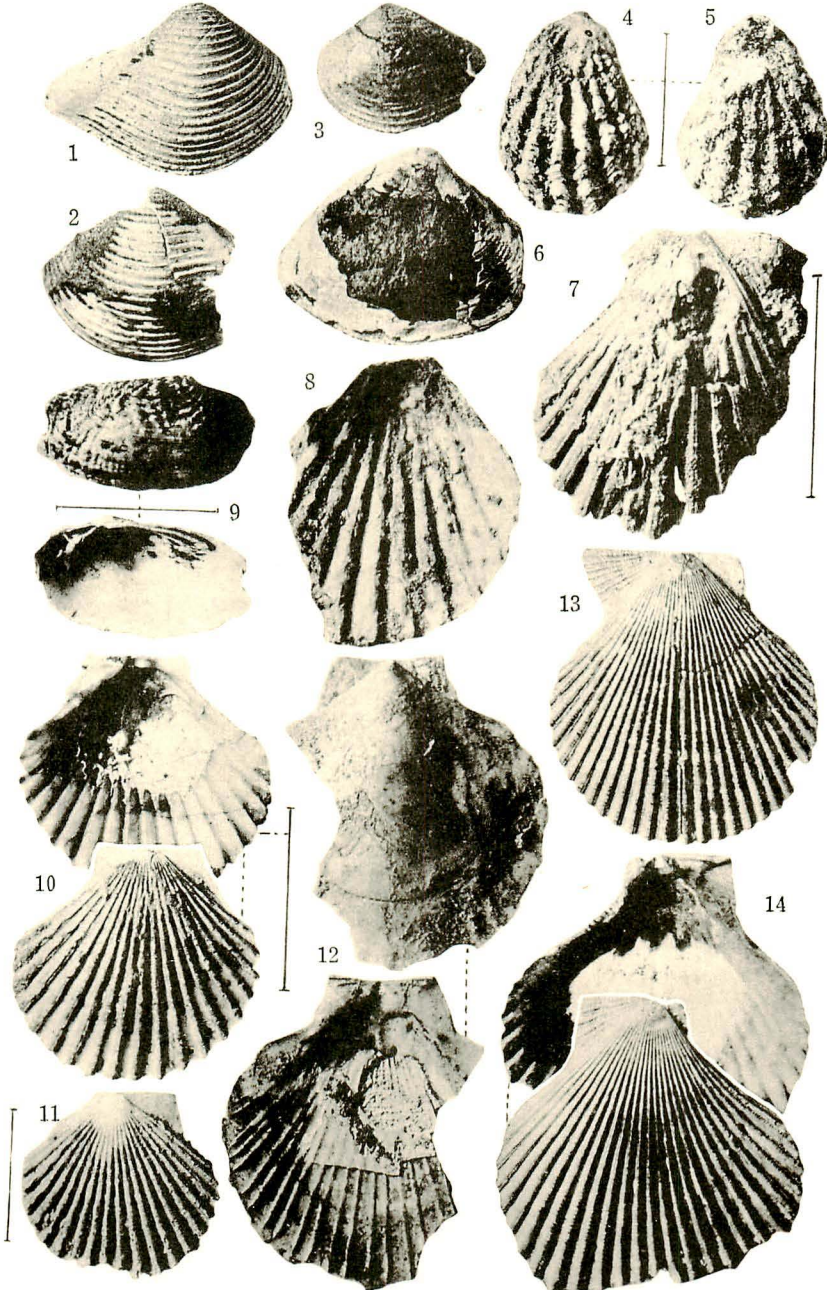
Placenta placenta (LINNAEUS, 1758), (XXXII, 92). Right valve. Lower Byoritz; Usantô,
Tainan. **Placuna placenta** (LINNAEUS).



XXXII. Mollusca from the Oil-Field of Taiwan.

PLATE 99.

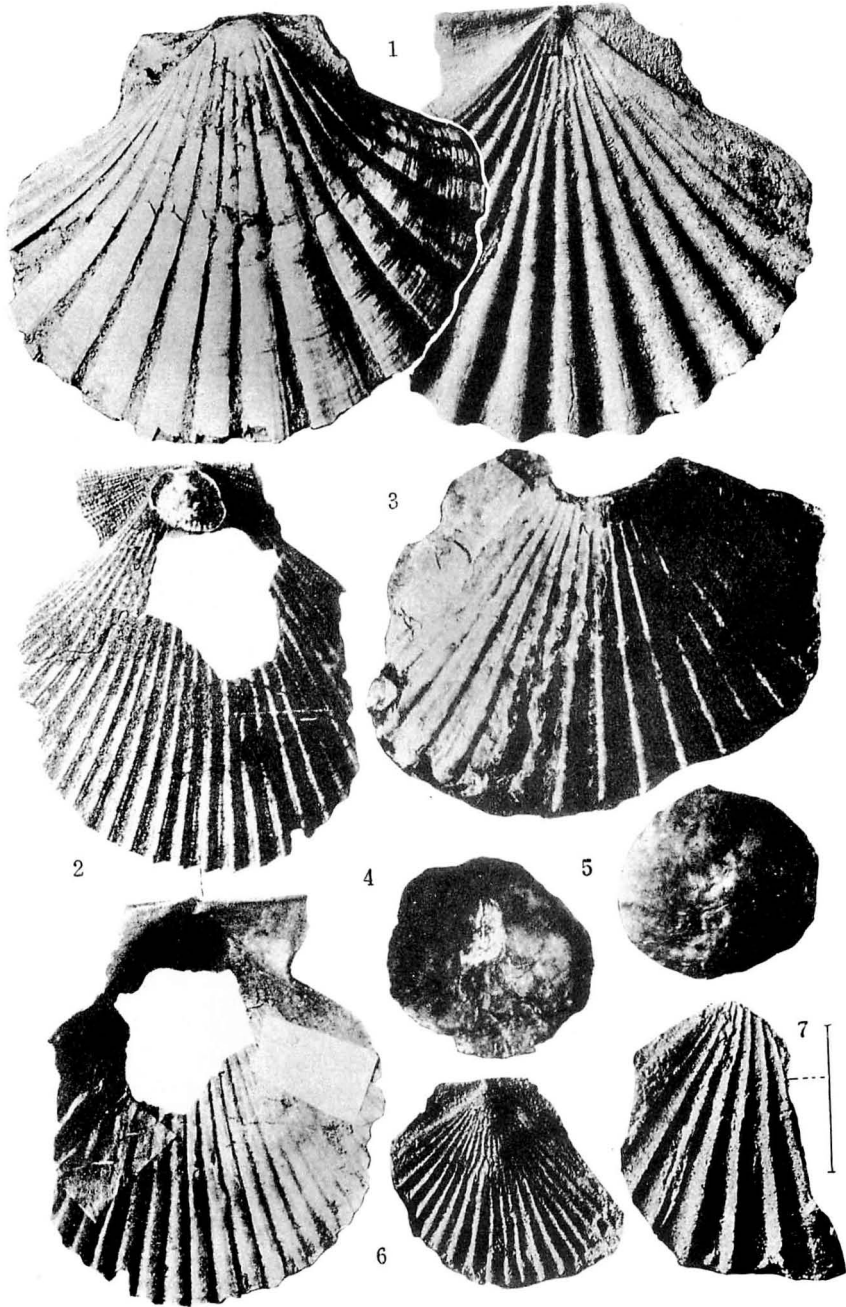
- 1, 2, 3. *Crassatellites oinouyei* YOKOYAMA, 1928 (XXXII, 89, n. sp.). Lower Byoritz; 1, 2: Injurin, Shinchik; 3: Kyûkyûrin, Shinchik. **Crassatellites foveolatus** (SOWERBY, 1870).
- 4, 5. *Plicatula cuneata* DUNKER, 1877, (XXXII, 92). Upper Byoritz; Kizan, Byoritz Gai, Shinchik. **Plicatula simplex** GOULD, 1861, *vide* KURODA.
6. *Gomphina* sp., (XXXII, 83), cf. *melanaegis* RÖMER, 1861. Lower Byoritz; at the mouth of Banbakôkei, Shinchik. **Gomphina** sp., cf. *undulosa* (LAMARCK, 1818).
- 7, 8. *Pecten (Chlamys) aurantiacus* ADAMS & REEVE, 1850, (XXXII, 93). Shokkôsan, Hanpeisan, Takao. **Chlamys aurantica** (ADAMS & REEVE).
9. *Unio nipponensis* MARTENS, 1877, (XXXII, 90). Lower Byoritz; between Rokjûkei and Sekibyô, Tainan. **Lymnium douglasiae taiwanicum** (PILSBY, 1905).
- 10, 11. *Pecten (Vola) javanus* MARTIN, 1879, (XXXII, 98). Upper Byoritz; Tenshi, Shikôshô, Shinchik. **Pecten javanus** MARTIN, 1897.
12. *Pecten (Amusium) japonicus* GMELIN, 1791, (XXXII, 95). Upper Byoritz; Tenshi, Shikôshô, Shinchik. **Amusium japonicum** (GMELIN).
- 13, 14. *Pecten (Chlamys) satoi* YOKOYAMA, 1928 (XXXII, 94, n. sp.). Upper Byoritz; 13: Hôtosak, Rikôshô, Taihok; 14: Ubikô, Tsûshôshô, Shinchik. **Chlamys satoi** YOKOYAMA.



XXXII. Mollusca from the Oil-Field of Taiwan.

PLATE 100.

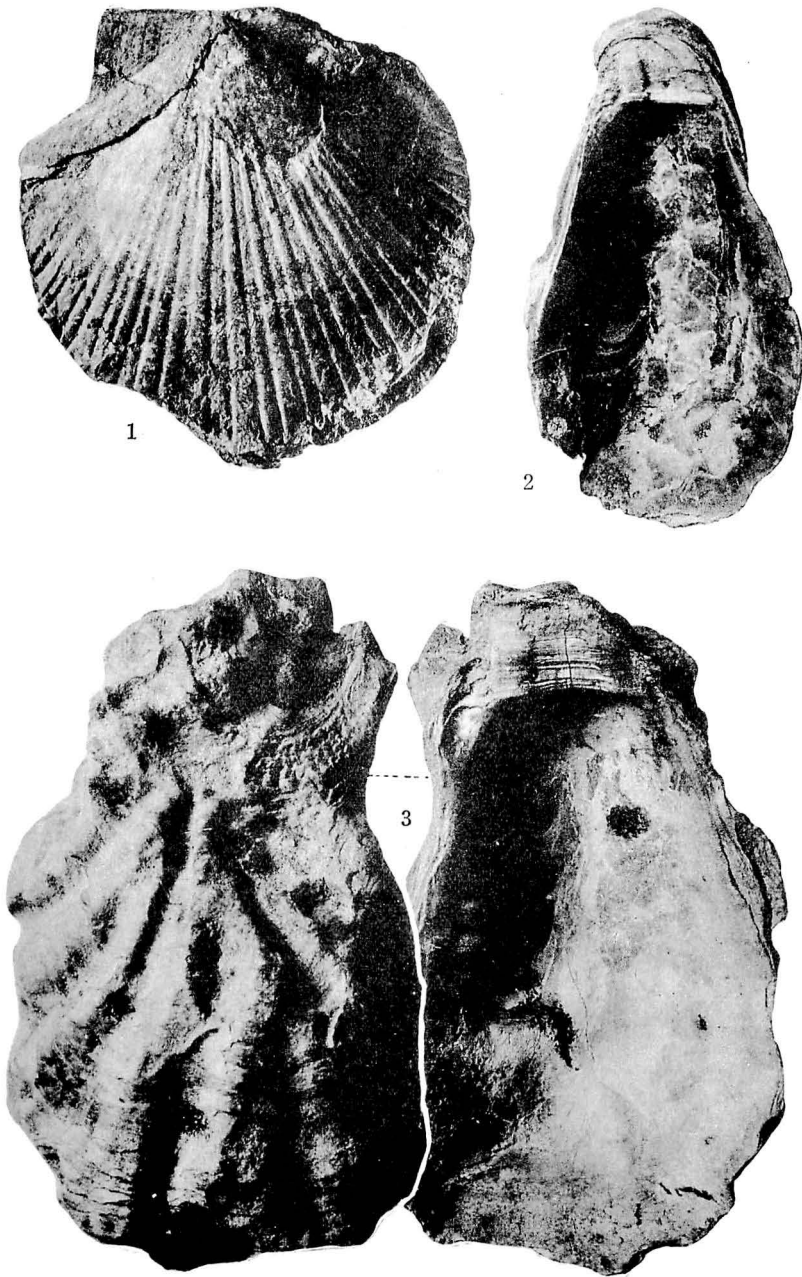
1. *Pecten (Vola) sinensis* SOWERBY, 1842. (XXXII, 97). Upper Byoritz; Jônanseikô, Shikoshô, Shinchik. *Pecten (Vola) naganumanus* YOKOYAMA, 1920, NOMURA, 1933; **Pecten (Notovola) naganumanus** YOKOYAMA, 1920.
2. *Pecten (Chlamys) satoi* YOKOYAMA, 1928, see pl. 99, f. 13, 14, same loc. **Chlamys satoi** YOKOYAMA.
3. *Pecten (Chlamys)* sp., (XXXII, 94) $\times 2/3$. Upper Arisan; Sanshikyakkei, Taihok. **Chlamys** sp. cf. *kaneharai* YOKOYAMA, 1926.
- 4, 5. **Anomia lischkei** DAUTZENBERG & FISCHER, 1906, (XXXII, 91). Lower Byoritz; Hok'ho, Sanwanshô, Shinchik.
6. *Pecten* sp., (XXXII, 98). Upper Arisan; Satô, Shinchik. **Pecten** sp., cf. *P. (Aequipecten) leopardus* REEVE, 1853, *vide* NOMURA, 1933.
7. *Pecten (Chlamys)* ? sp., (XXXII, 95). Upper Arisan; Bôryô, Takao. **Pecten** sp., *nec Chlamys*.



XXXII. Mollusca from the Oil-Field of Taiwan.

PLATE 101.

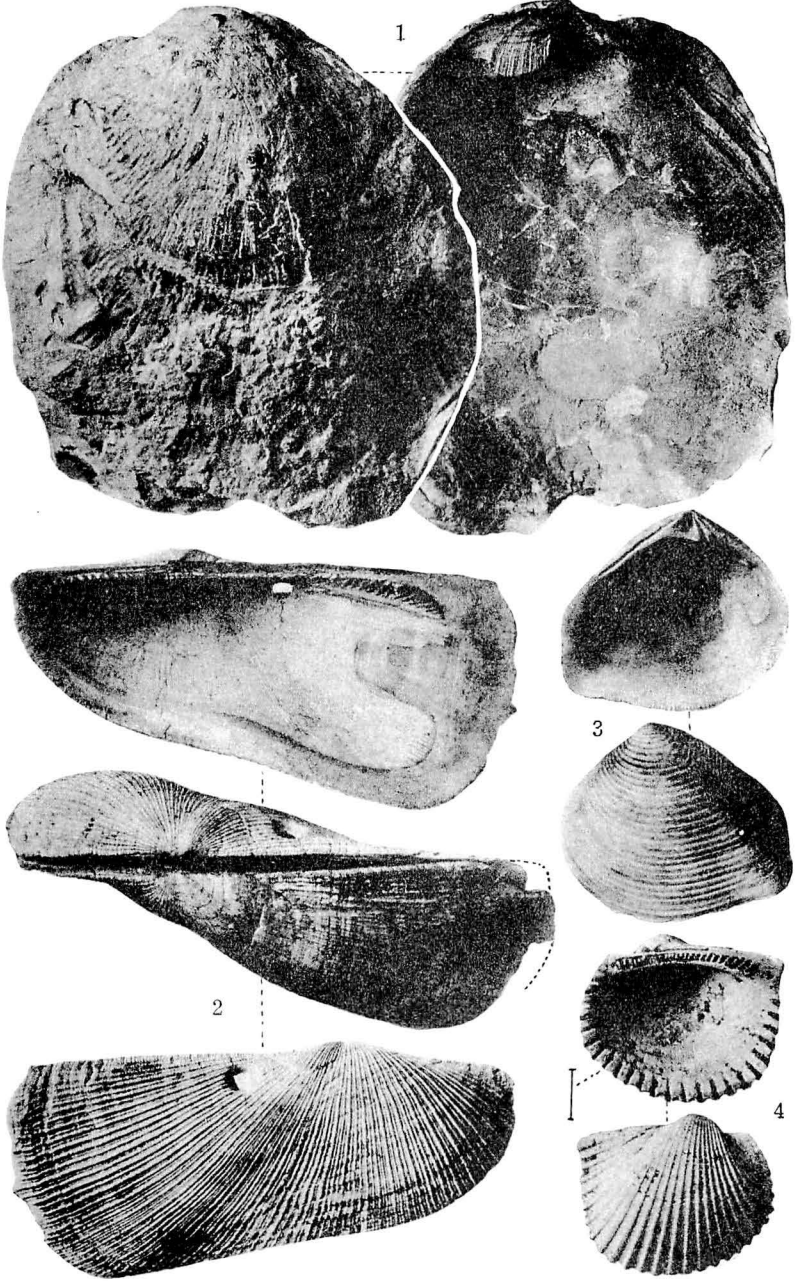
1. *Pecten (Amusium) praesignis* YOKOYAMA, 1922, (XXXII, 96) $\times 2/3$. Upper Arisan; Kwan-shirei, Hakshashô, Tainan. *Pecten (Amusiopecten?) yabei* NOMURA, 1933; **Amussiopecten (Flabellipecten) yabei** NOMURA, 1933.
- 2, 3. **Ostrea gigas** THUNBERG, 1793, (XXXII, 99). 2: Shokkôsan (Pleistocene); Zenpôbi, Takao; 3: Upper Byoritz; Hôtosak, Rinkô shô, Taihok.



XXXII. Mollusca from the Oil-Field of Taiwan.

PLATE 102.

1. *Ostrea denselamellosa* LISCHKE, 1869, (XXXII, 100) $\times 2/3$. Lower Byoritz; Wankyô, Tainan. ***Ostrea ariakensis*** FUJITA, 1913, NOMURA, 1933.
2. *Arca (Parallelopedum) tortuosa* LINNAEUS, 1758, (XXXII, 105). Upper Byoritz, Kizan, Byoritz Gai, Shinchik. *Arca (Trisidos) kiyonoi* MAKIYAMA, 1931, NOMURA, 1933; ***Trisidos tortuosa kiyonoi*** MAKIYAMA, 1931.
3. *Crassatellites heteroglyptus* PILSBRY, 1895, (XXXII, 88). Upper Byoritz; Shikô, Kôshun, Takao. ***Crassatellites loebbeckei*** (KOBELT, 1886), NOMURA, 1933.
4. *Arca (Argina) auriculata* LAMARCK, 1819, (XXXII, 104). Upper Byoritz; Hôtosak, Rinkôshô, Taihoku. ***Anadara (Argina) auriculata*** (LAMARCK), non SOWERBY, 1833.



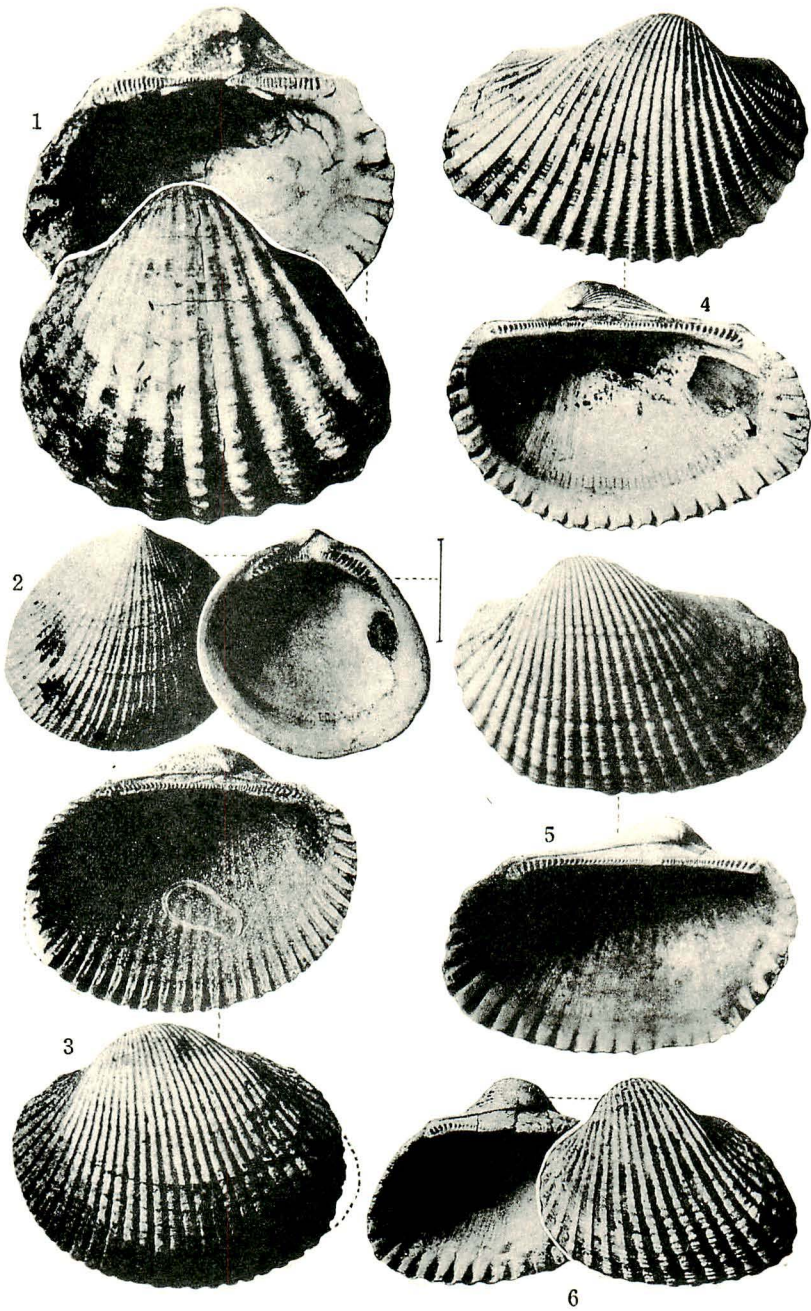
XXXII. Mollusca from the Oil-Field of Taiwan.

PLATE 101

1. *Amphispiza bilineata* (Aud.) (1825) (ZXXII, 101). Upper throat; lower throat; side view. (See also Plate 100, 1.)
2. *Amphispiza bilineata* (Aud.) (1825) (ZXXII, 102). Upper throat; side view. (See also Plate 100, 2.)
3. *Amphispiza bilineata* (Aud.) (1825) (ZXXII, 103). Upper throat; side view. (See also Plate 100, 3.)
4. *Amphispiza bilineata* (Aud.) (1825) (ZXXII, 104). Upper throat; side view. (See also Plate 100, 4.)
5. *Amphispiza bilineata* (Aud.) (1825) (ZXXII, 105). Upper throat; side view. (See also Plate 100, 5.)

PLATE 103.

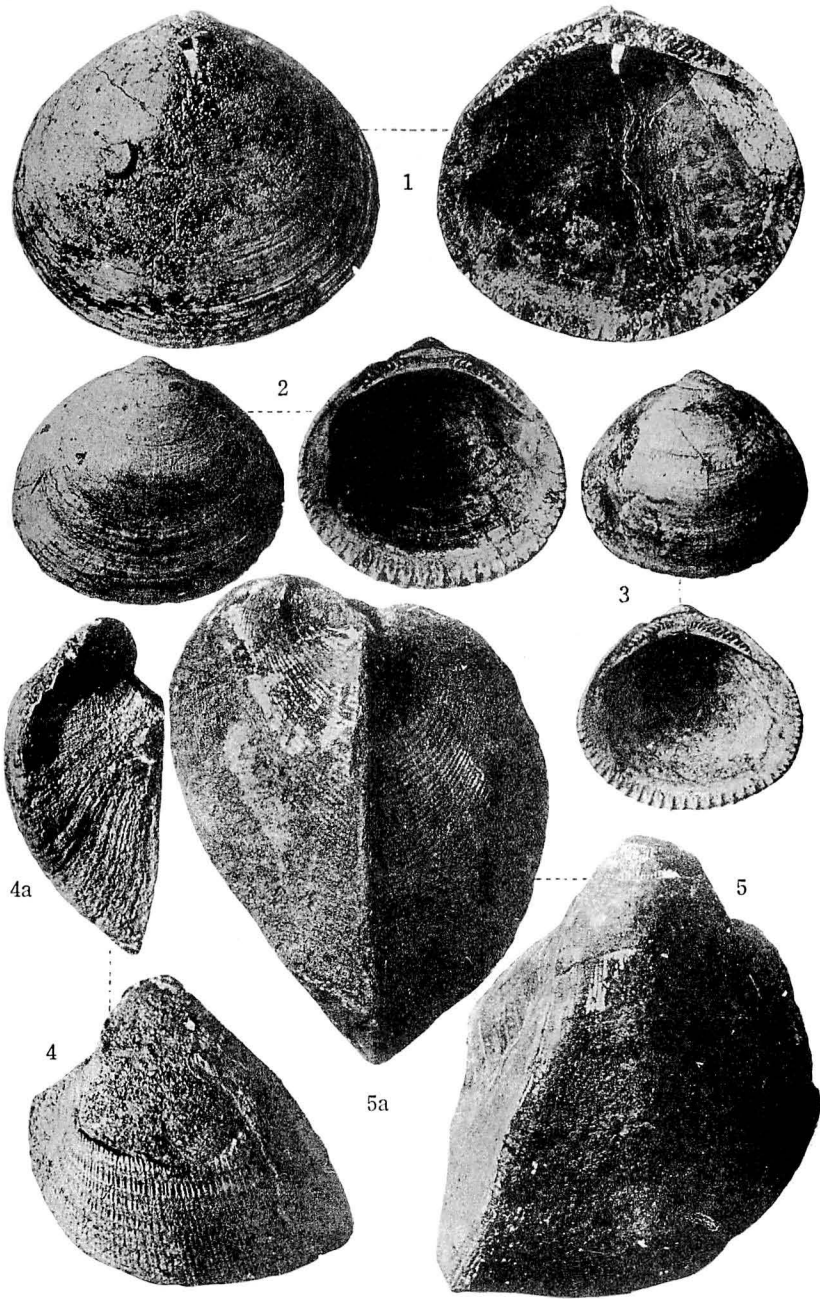
1. *Arca (Anomalocardia) granosa* LINNAEUS, 1758, (XXXII, 101). Upper Byoritz; Jôwan, Shikoshô, Shinchik. *Arca (Arca) granosa*, NOMURA, 1933; *Anadara (Tegillarca) granosa*, T. & O., 1952; **Anadara granosa** (LINNAEUS).
2. *Limopsis woodwardi* ADAMS, 1862, (XXXII, 107). Upper Byoritz; Shikô, Kôshun, Takao. *Limopsis multistriata* (FORSKÅL, 1775), NOMURA, 1933; **Limopsis multistriata** (BRUGUIÈRE, 1792).
3. *Arca (Scapharca) inflata* REEVE, 1844, (XXXII, 102). Upper Byoritz; Tenshi, Shikoshô, Shinchik. **Anadara (Scapharca) broughtonii** (SCHRENCK, 1867).
- 4, 5. *Arca (Scapharca) philippiana* DUNKER, 1882, (XXXII, 103). Upper Byoritz; Shikô, Kôshun, Takao. **Anadara (Scapharca) tricenicosta** (NYST, 1844).
6. *Arca (Scapharca) subcrenata* LISCHKE, 1869, (XXXII, 103). Upper Byoritz; Sankô, Injurin, Shinchik. **Anadara (Scapharca) cornea** REEVE, 1844, *vide* KURODA.



XXXII. Mollusca from the Oil-Field of Taiwan.

PLATE 104.

- 1, 2, 3. *Pectunculus formosanus* YOKOYAMA, 1928, (XXXII, 106, n. sp.). Upper Byoritz; 1: Shûtô, Sankyaksui, Shinchik; 2: Kôdenkô, Shikoshô, Shinchik; 3: Tenshi, Shikoshô, Shinchik. **Glycymeris formosana** (YOKOYAMA).
- 4, 5. *Cucullaea pamotanensis* MARTIN, 1909, (XXXII, 107). Lower Byoritz; 4: west of Bitô, Zuihôshô, Taihok; 5: lower course of the Senzankei, Kôwanshô, Shinchik. **Cucullaea granulosa** (JONAS, 1846), NOMURA, 1933.

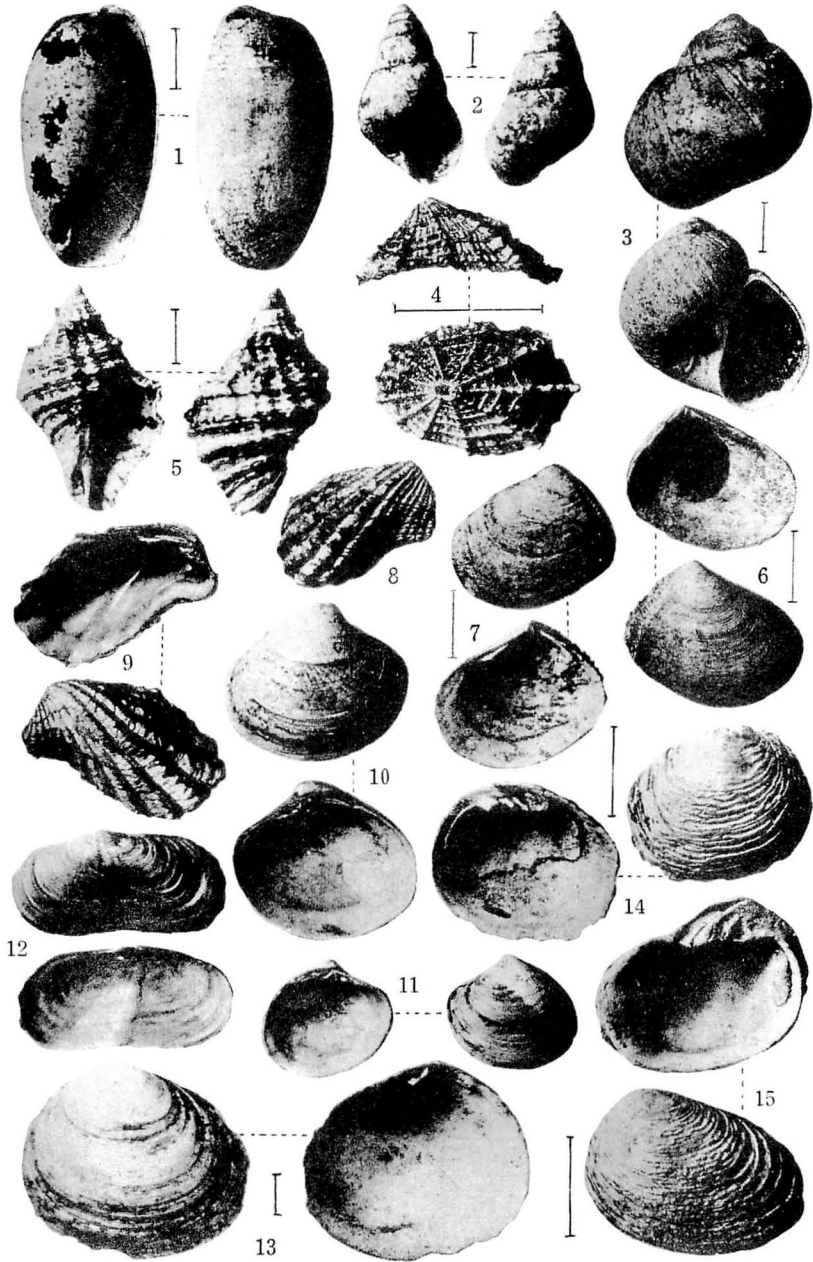


XXXII. Mollusca from the Oil-Field of Taiwan.

PLATE 105.

1. *Cylichna incisula* YOKOYAMA, 1928, (XXXIII, 122, n. sp.). **Liloa incisula** (YOKOYAMA), K. & H., 1952.
2. *Rissoa (Cingula) subdharma* YOKOYAMA, 1928, (XXXIII, 123, n. sp.). **Cingula subdharma** YOKOYAMA.
3. *Polinices pallidus* BRODERIP & SOWERBY, 1829, (XXXIII, 124); **Uberella yokoyamai** KURODA & HABE, 1954.
4. *Fissuridea sieboldii* (REEVE, 1850), (XXXIII, 124); **Diodora sieboldii** (REEVE).
5. *Cuma pseudodiadema* YOKOYAMA, 1928, (XXXIII, 122, n. sp.). **Purpura (Thais) pseudo-diadema** (YOKOYAMA). *fide* OYAMA, verbally.
- 6, 7. *Tellina gargadia* LINNAEUS, 1758, (XXXIII, 125). **Arcopagia (Quadrans) spinosa** (HANLEY, 1845), *fide* KURODA.
- 8, 9. *Cardita crassicosta* LAMARCK, 1819, (XXXIII, 128). **Cardita leana** DUNKER, 1860.
- 10, 11. *Meretrix tigrina* (LAMARCK, 1818), (XXXIII, 126). **Pitar limatula** (SOWERBY, 1832).
12. *Solecortus abbreviatus* GOULD, 1861, (XXXIII, 124). **Azorinus abbreviatus** (GOULD).
13. **Kellia notoensis** YOKOYAMA, 1928, (XXXIII, 127, n. sp.).
- 14, 15. **Petricola japonica** DUNKER, 1882, (XXXIII, 126).

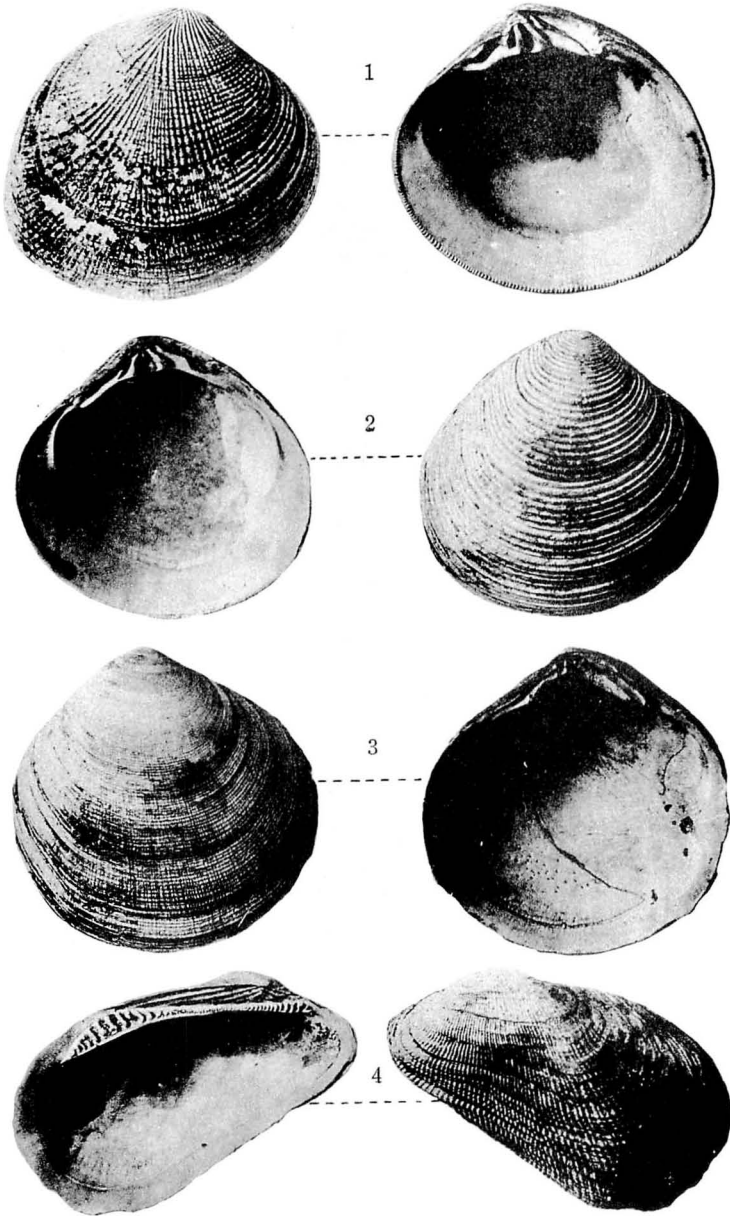
All the figured specimens (pl. 105 & 106) came from the same locality at the west shore of Port Nanao, Noto (Ishikawa pref.). They are semi-fossil shells in the raised beach.



XXXIII. Semi-Fossil Shells from Noto.

PLATE 106.

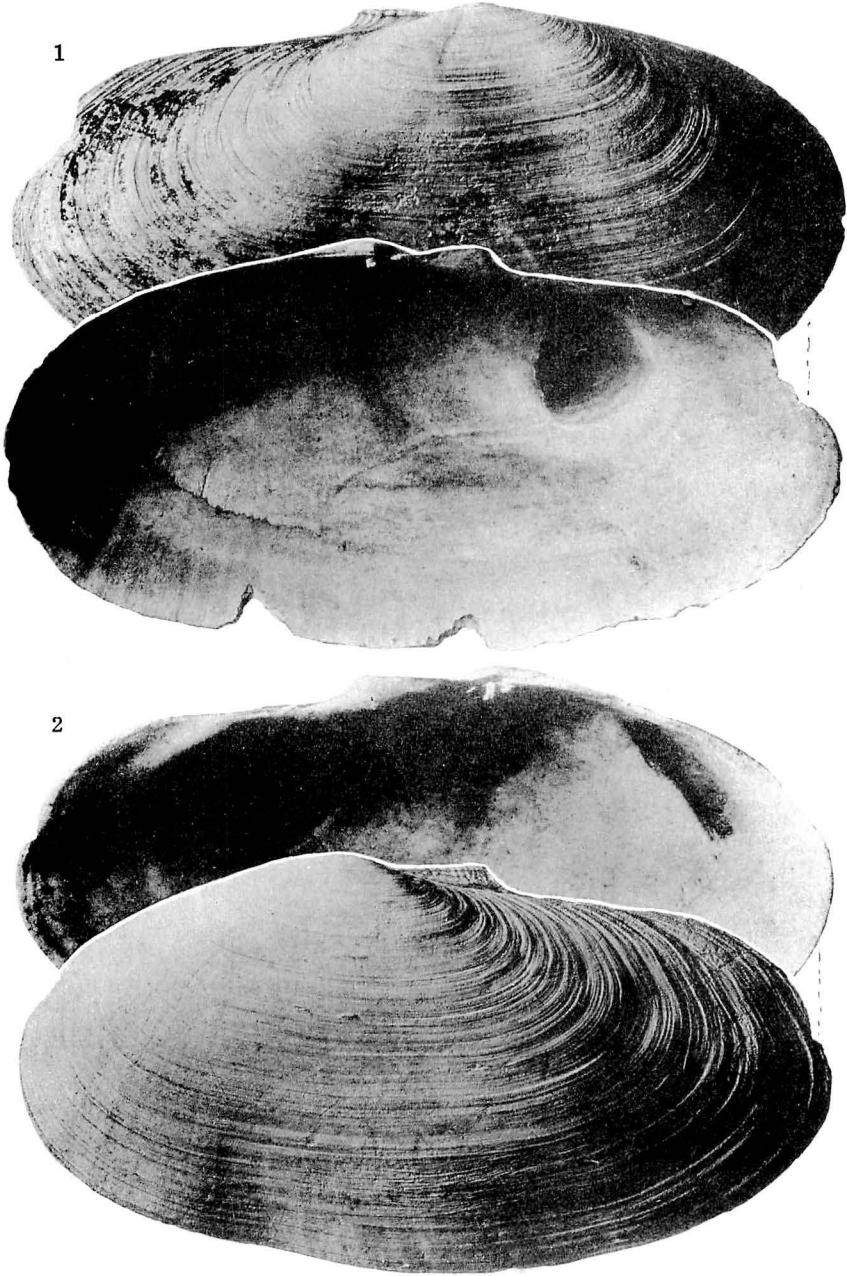
1. *Circe divaricata* CHEMNITZ, (XXXIII, 127). **Gafrarium divaricatum** (GMELIN, 1790).
2. *Circe scripta* (LINNAEUS, 1758), (XXXIII, 127). **Circe stutzeri** (DONOVAN, 1834), see pl. 94, f. 7.
3. *Semele sinensis* ADAMS, 1853, (XXXIII, 125). *Amphidesma sinensis* REEVE, 1853. **Semele cardiformis** (HOLTEN, 1802).
4. *Arca decurvata* LISCHKE, 1869, (XXXIII, 128). **Barbatia obtusoides** NYST, 1844.



XXXIII. Semi-Fossil Shells from Noto.

PLATE 107.

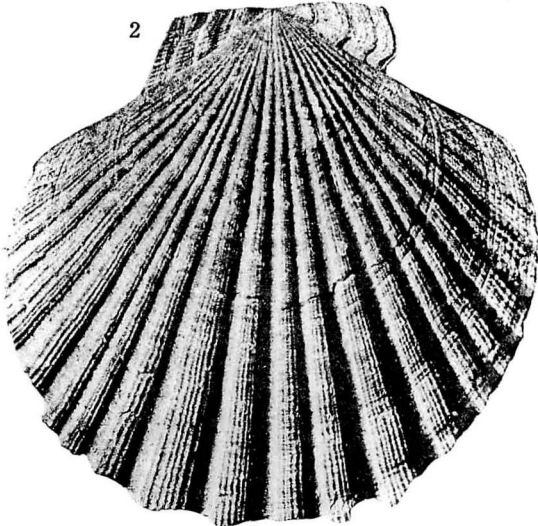
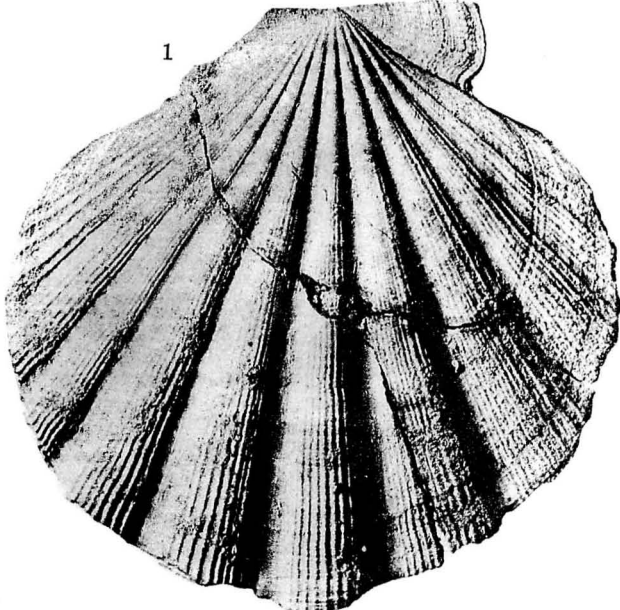
Soletellina adamsii DESHAYES, (XXXIII, 121). Near Funabashi at Saginuma, Shimôsa; about three feet below the surface of the ground in a bed of sand. ***Sanguinolaria adamsii*** (REEVE, 1867), DESHAYES *nom. nud.*



XXXIII. Semi-Fossil Shells from Noto.

PLATES 108.

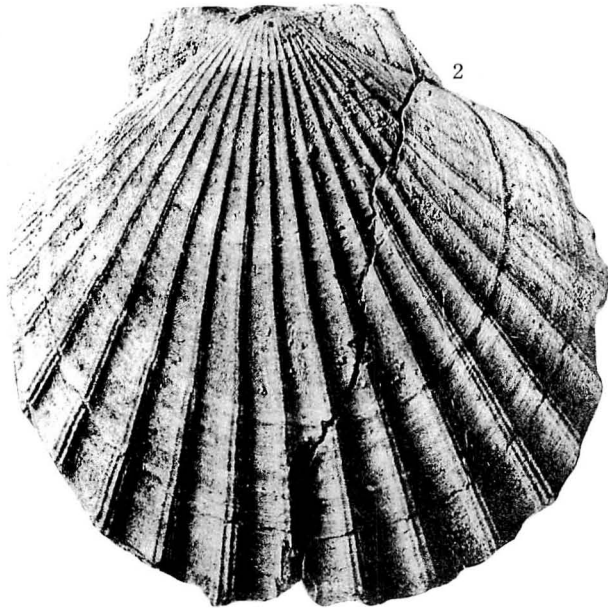
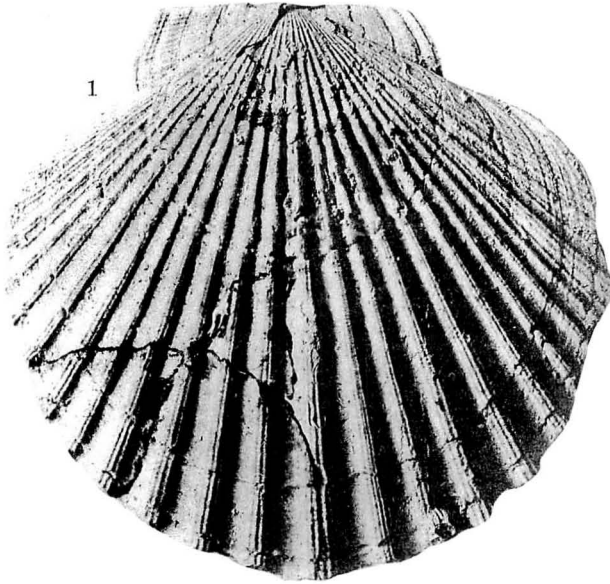
Pecten (Painopecten?) kagamianus YOKOYAMA, 1923, (XXXIV, 2). Right valve. $\times 2/3$. Kokubu near Nanao, Noto, Ishikawa prefecture; in the Nanao formation (Miocene). **Pecten kagamianus** YOKOYAMA.



XXXIV. Pliocene Shells from near Nanao.

PLATE 109.

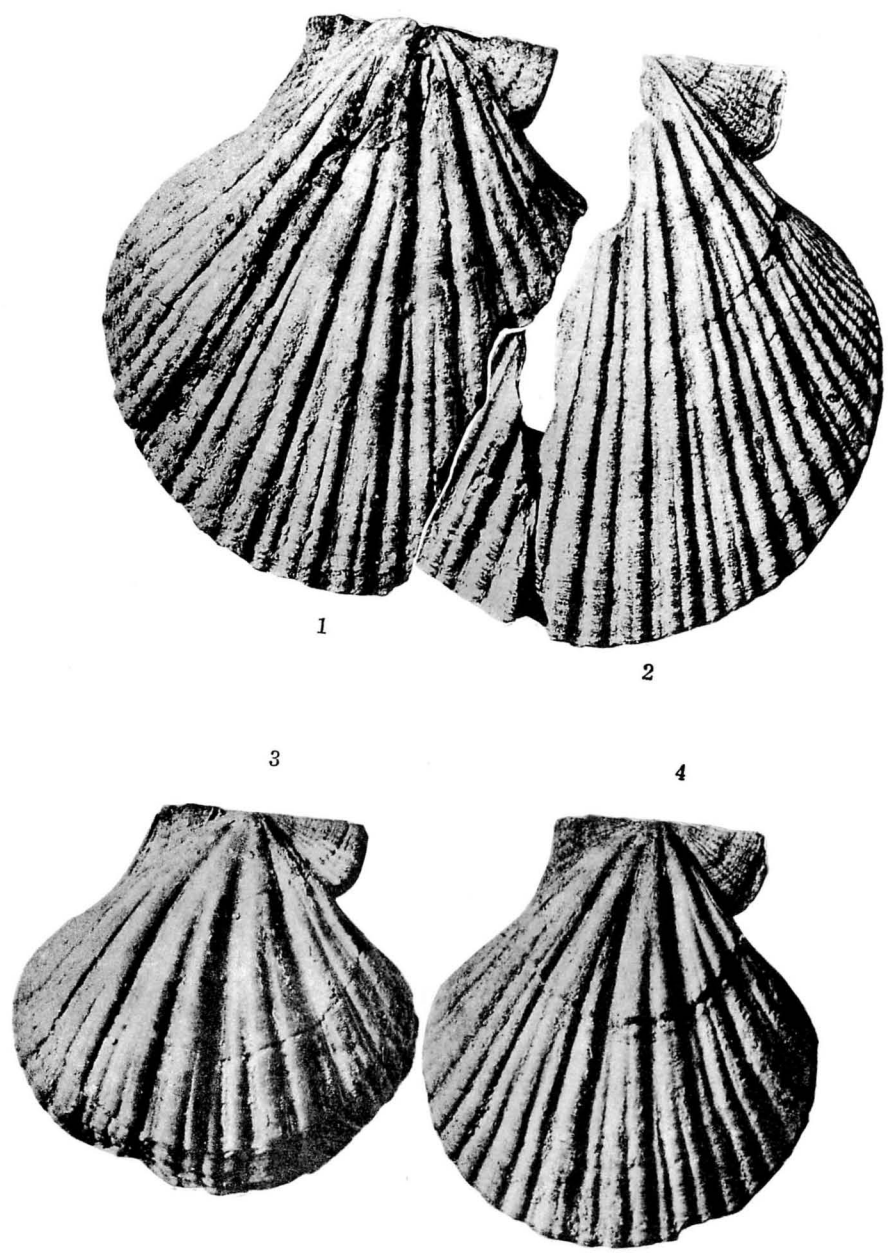
Pecten (*Patinopecten*?) *kagamianus* YOKOYAMA, 1923, (XXXIV, 2). Left valve. $\times 2/3$. Kokubu near Nanao, Noto, Ishikawa prefecture; in the Nanao formation (Miocene). *Pecten kagamianus* YOKOYAMA.



XXXIV. Pliocene Shells from near Nanao.

PLATE 110.

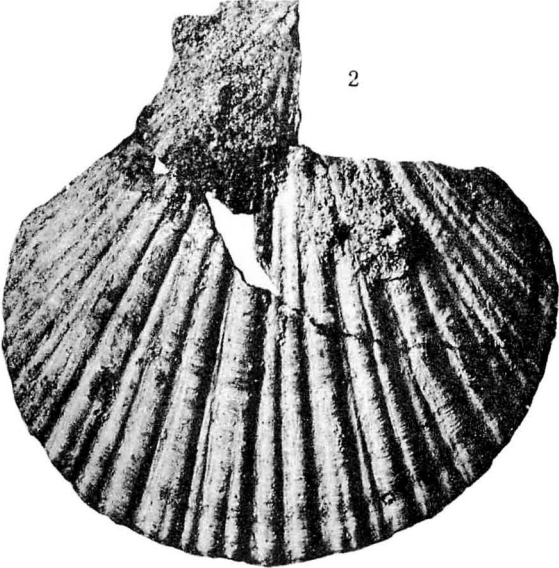
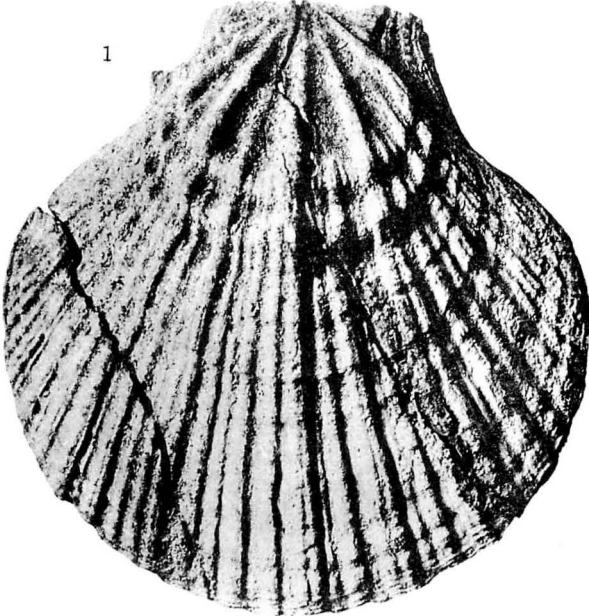
Pecten notoensis YOKOYAMA, 1929 (XXXIV, 4, n. sp.). Right valve. In the Nanao Miocene, at cliff behind Hosoguchi in Tokuda near Nanao, Ishikawa pref., 37°51'N, 140°36'E.
Chlamys notoensis (YOKOYAMA), NOMURA & ZIMBO, 1935.



XXXIV. Pliocene Shells from near Nanao.

PLATE 111.

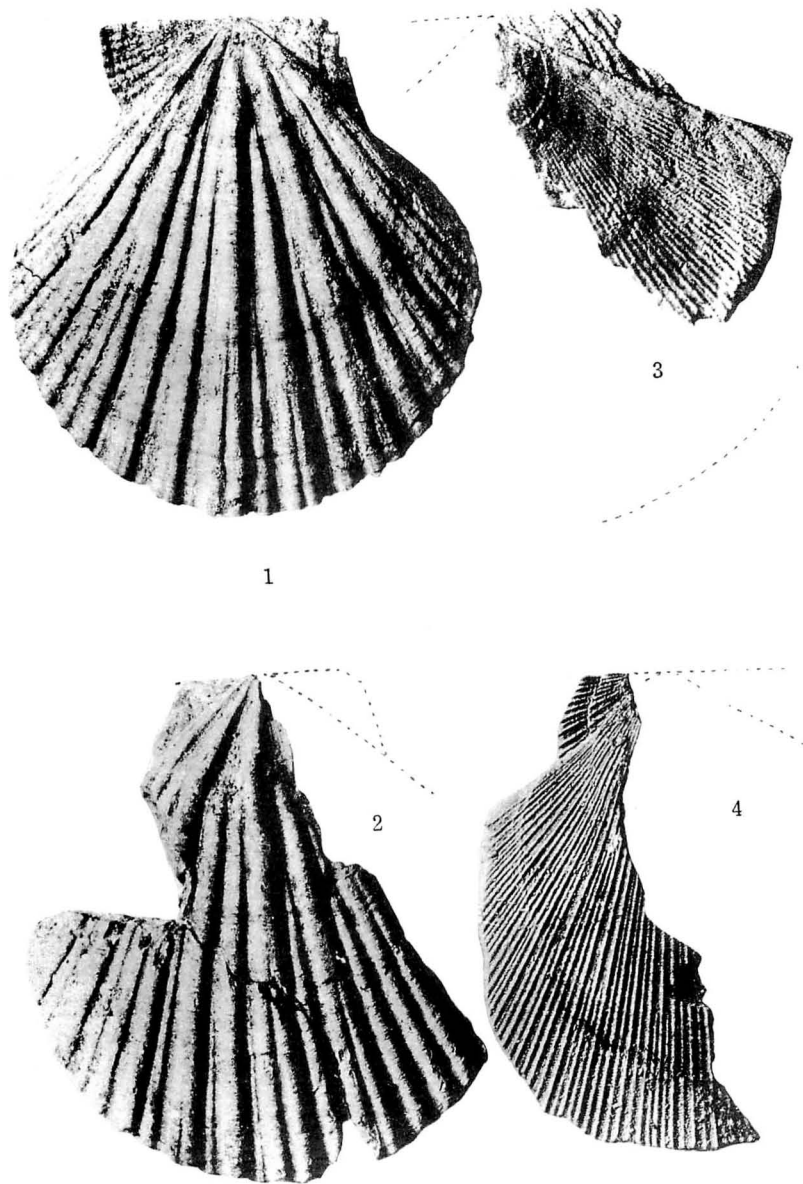
Pecten notoensis YOKOYAMA, 1929 (XXIV, 4, n. sp.). Left valve. In the Nanao Miocene, at cliff behind Hosoguchi in Tokuda near Nanao, Ishikawa pref., 37°51'N, 140°36'E. *Chlamys notoensis* (YOKOYAMA), NOMURA & ZIMBO, 1935.



XXXIV. Pliocene Shells from near Nanao.

PLATE 112.

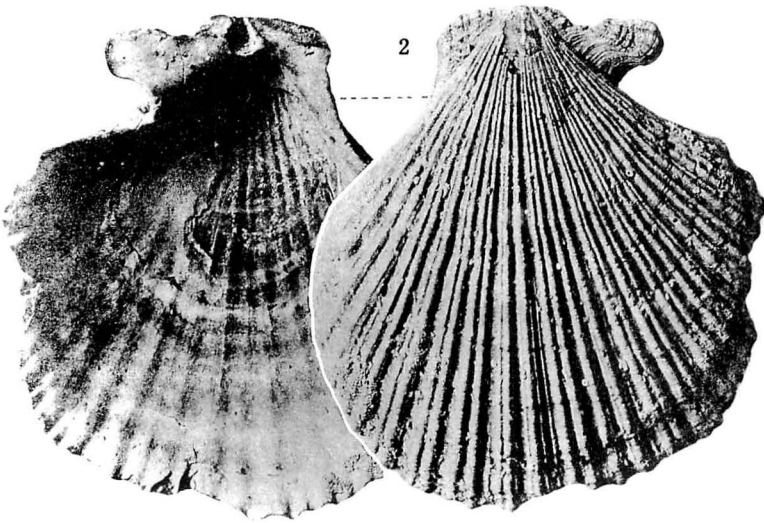
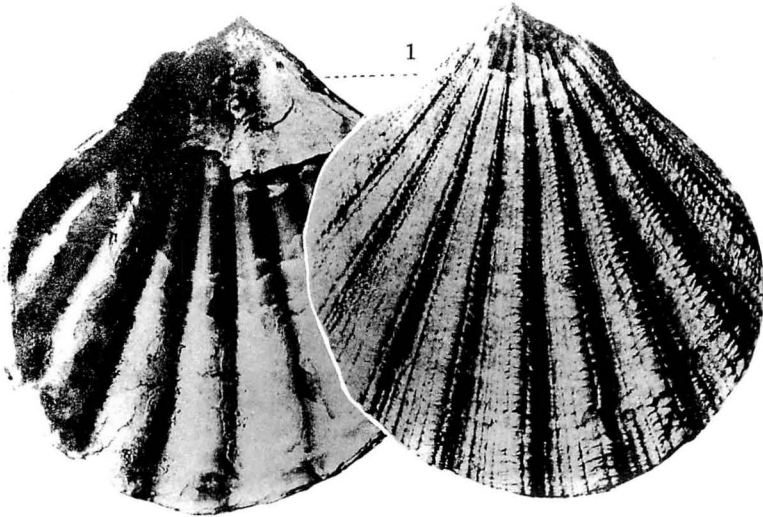
- 1, 2. *Pecten notocensis* YOKOYAMA, see pl. 110, 111.
3, 4. *Pecten* sp., (XXXIV, 6). Iwaya in Nanao; Micocene. *Chlamys protomollita* NOMURA,
1940; *Placopecten protomollitus*, H. & N., 1952.



XXXIV. Pliocene Shells from near Nanao.

PLATE 113.

1. *Pecten (Chlamys) crassivenius* YOKOYAMA, 1929, (XXXIV, 6, n. sp.). Iwaya, 500 m SW of Nanao, Ishikawa pref.; Nanao Miocene. **Chlamys crassivenia** YOKOYAMA, OTUKA, 1935.
2. *Pecten (Chlamys) hastatus* SOWERBY, 1843, var. *ingeniosa* YOKOYAMA, 1929, (XXXIV, 5, n. var.). Iwaya in Nanao, Nanao Miocene. **Chlamys hastata ingeniosa** YOKOYAMA.



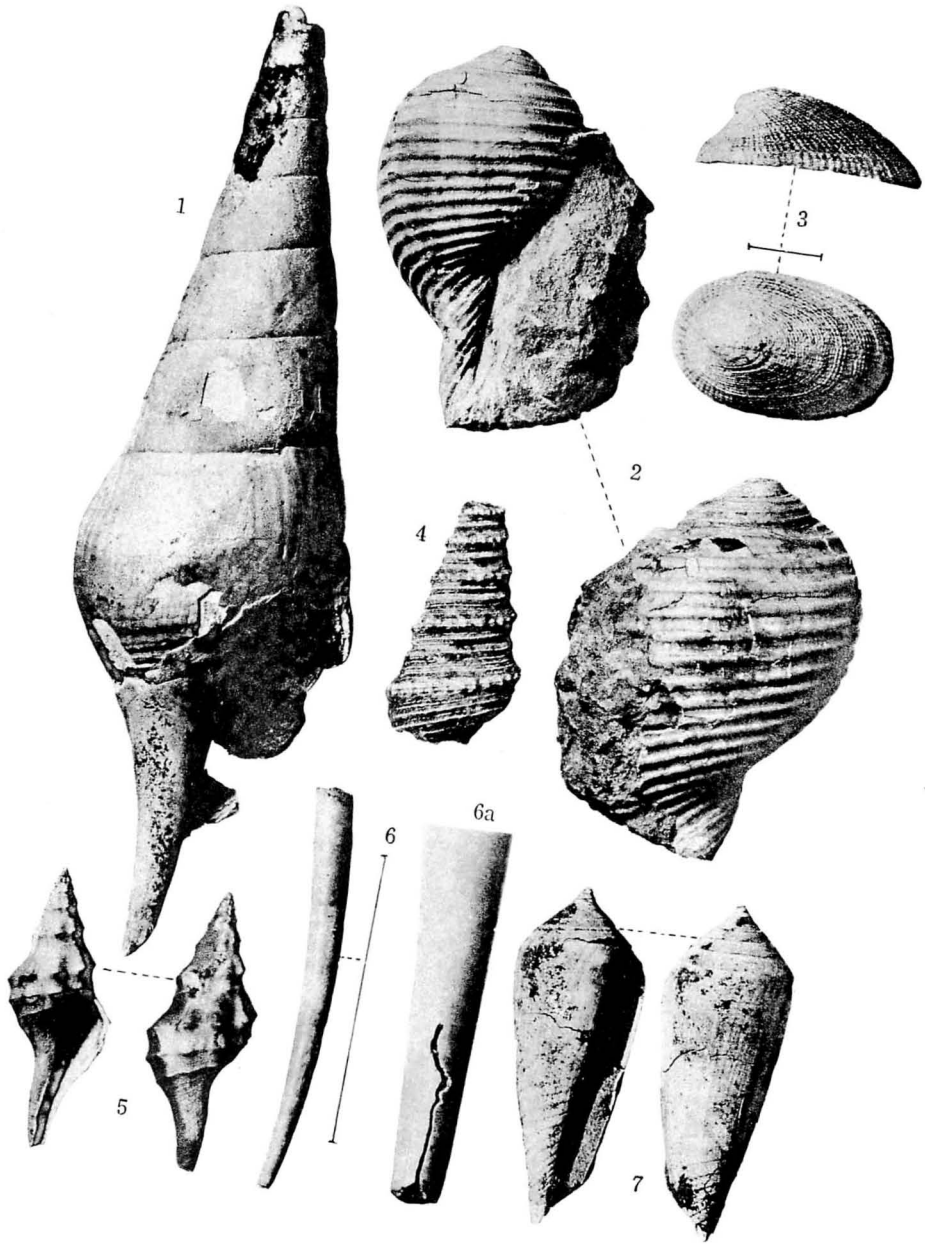
XXXIV. Pliocene Shells from near Nanao.

PLATE 114.

1. *Rostellaria fusus* LINNAEUS, 1758, (XXXV, 13). Tônohama. **Tibia fusus** (LINNAEUS).
2. *Dolium costatum* MENKE, 1829, (XXXV, 13). Tônohama. **Tonna allium** (DILLWYN, 1817).
3. *Submarginula cicatrosa* (ADAMS, 1851), (XXXV, 14). Tônohama. *Montfortia cicatrosa*, H. & N., 1952; **Tugali cicatrosa** (ADAMS) ?
4. *Pleurotoma carinata* GRAY var. *woodwardi* MARTIN, (XXXV, 12), see pl. 87, f. 17. Tônohama. **Turris (Gemmula) granosa** (HELBLING, 1779).
5. *Fusus dualis* YOKOYAMA, 1928, (XXXV, 12). Tônohama. **Purpura dualis** (YOKOYAMA),
6. *Dentalium (Fustiaria) suzukii* YOKOYAMA, 1929, (XXXV, 14, n. sp.). Tônohama. **Dentalium suzukii** YOKOYAMA.
7. *Conus comatosaeformis* YOKOYAMA, 1928, (XXXV, 12). Tônohama. **Asprella comatosaeformis** (YOKOYAMA), see pl. 87, f. 10.

Remarks

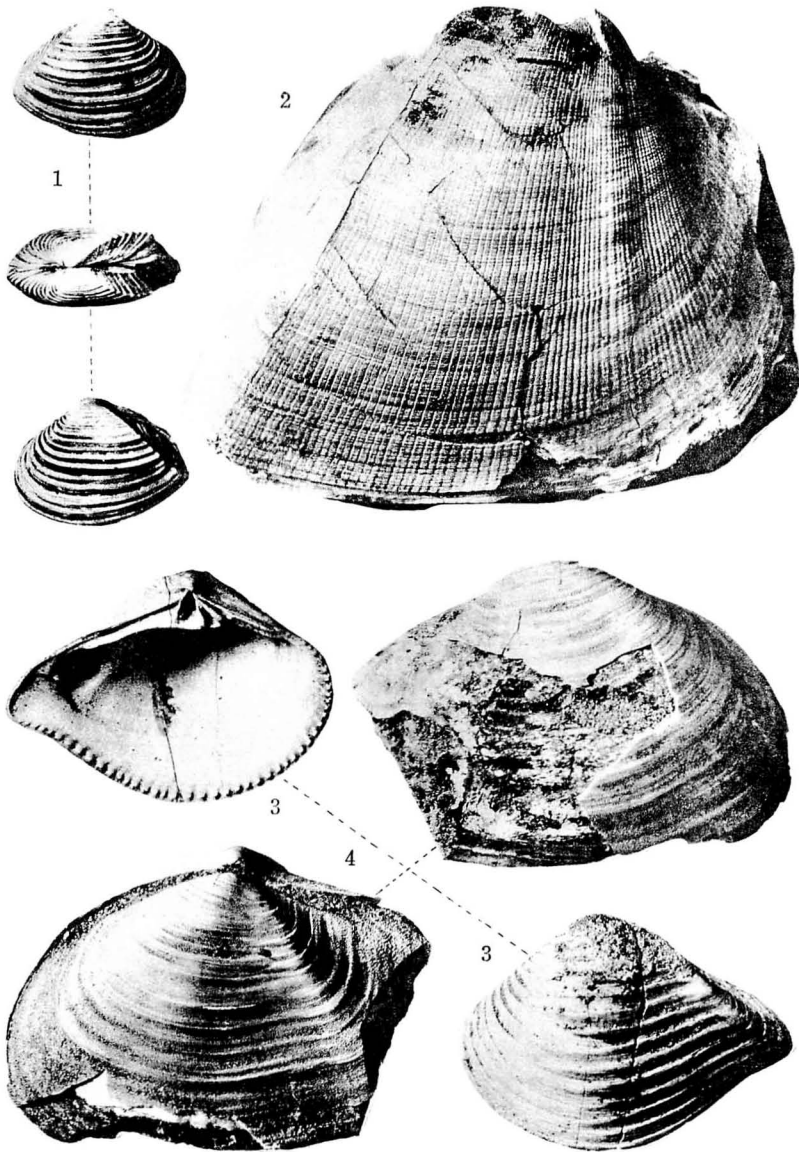
Localities Tonohama—various exposures in a small area around Tônohama near Aki, Kôchi prefecture, 33°26.7'N, 133°58.3'E.; Pliocene, *Suchian* age.



XXXV. Pliocene Shells from Tōnohara.

PLATE 115.

1. *Corbula tosana* YOKOYAMA, 1929 (XXXV, 15, n. sp.). Tônohama. *Anissocorbula tosana* (YOKOYAMA), HABE, 1949; ***Aloides tosana*** (YOKOYAMA), K. & H., 1952.
2. *Cucullaea concamerata* (MARTIN, 1891), (XXXV, 17). Tônohama. ***Cucullaea granulosa*** ((JONAS, 1846), see Pt. II, pl. 53, f. 2.
3. *Crassatellites yagurai* MAKIYAMA, 1927, (XXXV, 15). Tônohama. ***Crassatellites foveolatus*** (SOWERBY, 1870), TAN, 1936, KURODA; 1940.
4. *Thracia pubescens* PULTNEY, 1799, (XXXV, 16). Tônohama. ***Thracia kakumana*** (YOKOYAMA, 1927).

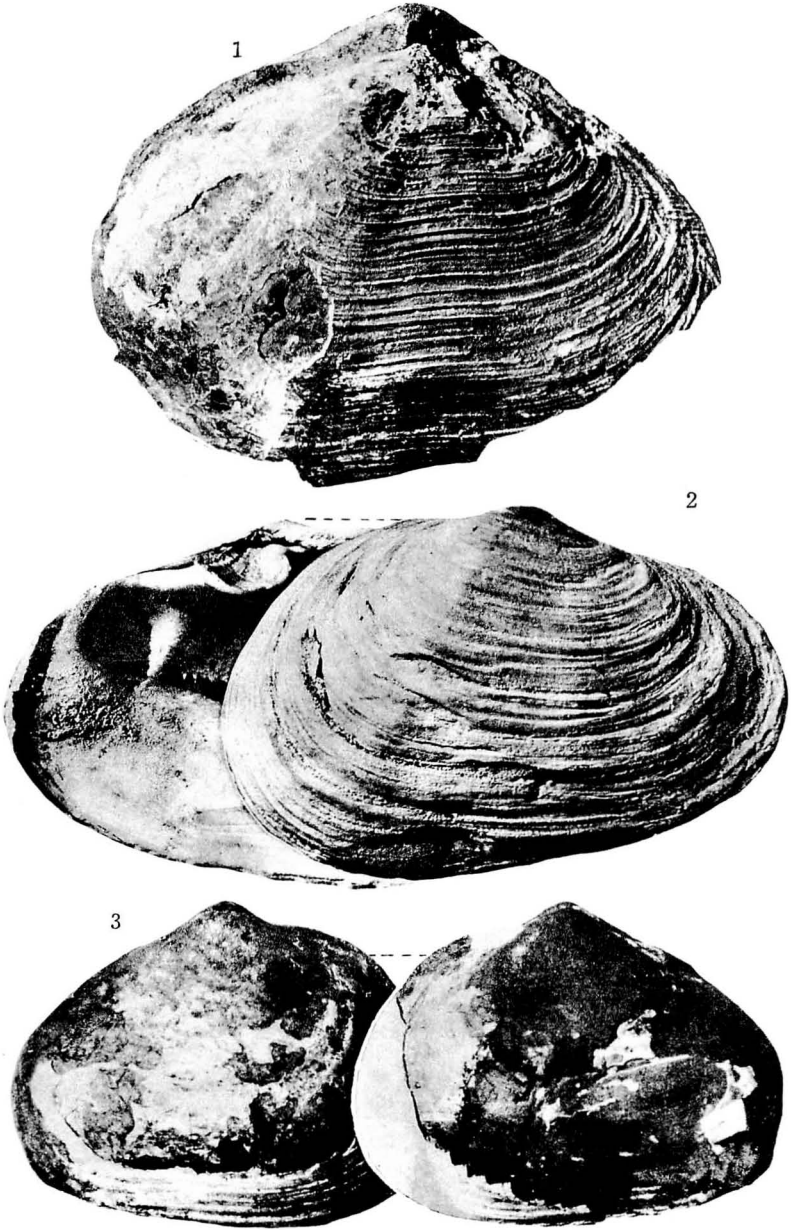


XXXV. Pliocene Shells from Tōnohama.

PLATE 116.

Mya crassa GREWINGK, 1850, (XXXVI, 12), see pt. I, pl. 11, f. 11.

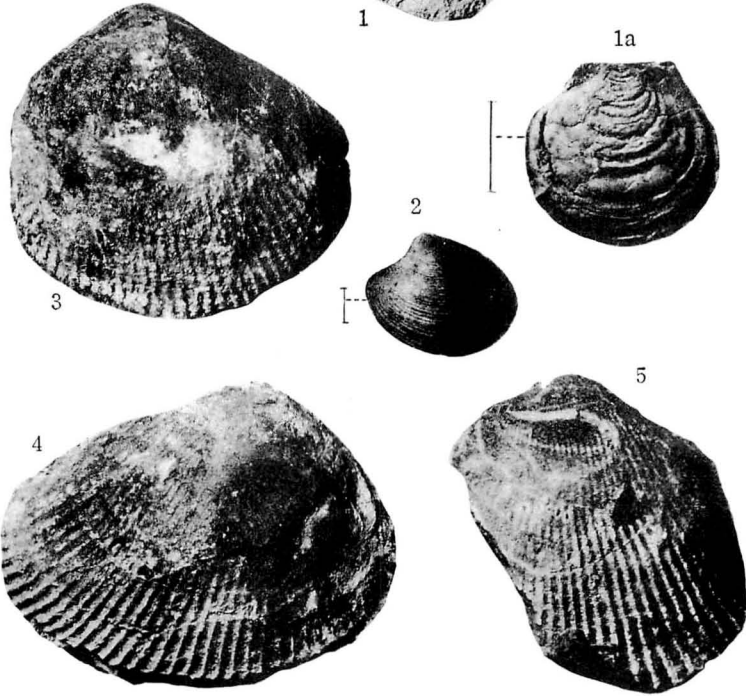
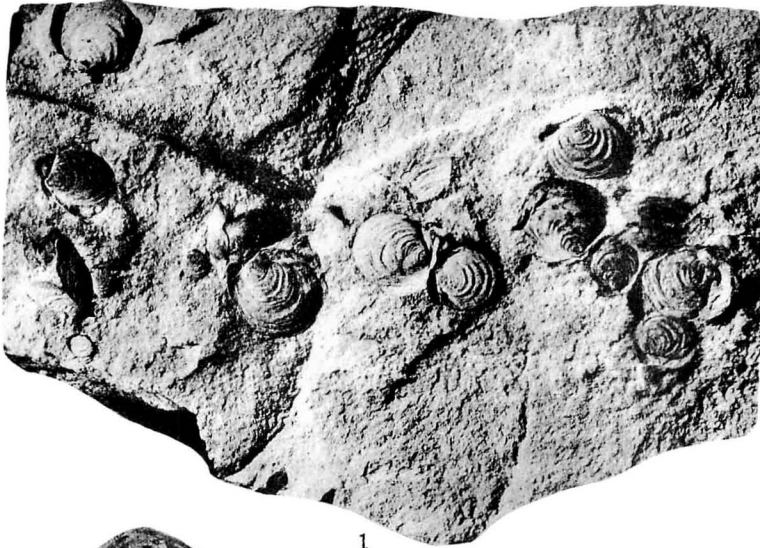
1. The third tributary of the Hishitori on its north side. **Mya grewingki** MAKIYAMA, 1934.
2. Living, Karafto. *Mya arenaria* var. *japonica*, for comparison. **Mya japonica** JAY, 1839.
3. The Koganesawa, Shiranui. **Mya grewingki** MAKIYAMA.



XXXVI. Neogene Shells from South Karafto.

PLATE 117.

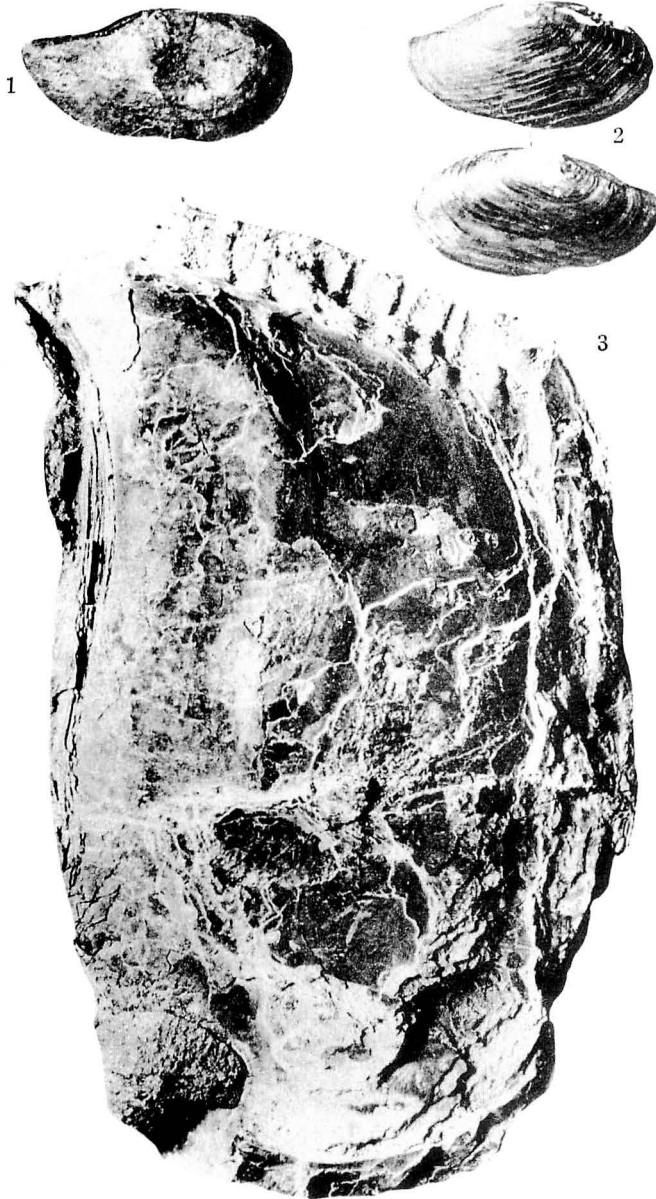
1. *Pecten* (*Pseudamysium*) *peckhami* GABB, 1869, (XXXVI, 14). Near Kushunnai, Karafto. *Delectopecten peckhami* (GABB), auct., more akin to *D. pedroanus* (TRUSK, 1856) = **Hyalopecten tairanus** (YOKOYAMA, 1925), cf. Pt. I, pl. 22, f. 8, 9?
2. *Corbula konotorensis* YOKOYAMA, 1932 (XXXVI, 12, n. sp.). Beds I of Tōfutsu region, on Tōfutsugawa. **Aloides konotorensis** (YOKOYAMA), a Venerid form?
- 3, 4, 5. *Papyridea* (*Fulvia*) cf. *nipponica* YOKOYAMA, 1924, (XXXVI, 13). Bed III of Dorogawa-Hishitori region, at the first tributary of the west branch of the Hachikonai. **Papyridea harrimani** DALL, 1904, see Pt. II, pl. 13, f. 4.



XXXVI. Neogene Shells from South Karafto.

PLATE 118.

1. **Yoldia** cf. **johanni** DALL, 1925, (XXXVI, 15). Minami-Pekere. Shiranui-mura.
2. **Yoldia johanni** DALL. Living, Karafto.
3. *Pedalion murayamai* YOKOYAMA, 1932 (XXXVI, 14, n. sp.). Bed III of the Dorogawa-Hishitori region; the third tributary of the Hishitori. **Isognomon murayamai** (YOKOYAMA).



XXXVI. Neogene Shells from South Karafto.

PLATE 119.

1. *Melongena onnaica* YOKOYAMA, 1932 (XXXVI, 11, n. sp.). River Onnai, S. Karafto; near at the junction with the seventh tributary counted from the mouth, west coast of Karafto.
2. *Melongena angasiana* YOKOYAMA, 1932 (XXXVI, 10, n. sp.). same loc. as f. 1.
Both f. 1 and f. 2 be **Buccinum graciale morchianum** (DUNKER, 1858), otherwise resembled to *B. carinata* (DUNKER, 1858).



XXXVI. Neogene Shells from South Karafto.

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PALAEONTOLOGICAL SOCIETY OF JAPAN
SPECIAL PAPERS
NUMBERS 3-6

Matajiro YOKOYAMA's

**TERTIARY FOSSILS FROM VARIOUS
LOCALITIES IN JAPAN**

Parts I-IV.

(1957-1960)

Revised by
Jirô MAKIYAMA

PUBLISHED BY THE SOCIETY

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1960年7月20日 印刷

1960年7月25日 発行

定価 950 円

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編 集 者 高 井 冬 二

発 行 者 市 川 健 雄

(振替口座東京 84780 番)

印 刷 者 東 京 都 港 区 芝 片 門 前 2 の 13

学 術 図 書 印 刷 株 式 会 社 富 田 元

購読御希望の方は東京都千代田区神田神保町1丁目7大久保書店
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