ILLUSTRATIONS

OF THE

ZOOLOGY

OF THE

ROYAL INDIAN MARINE SURVEY SHIP

INVESTIGATOR

UNDER THE COMMAND OF

COMMANDER W. G. BEAUCHAMP, R.I.M.

MOLLUSCA—Pt. VI, Pls. XXI—XXIII.

UNDER THE DIRECTION OF

N. ANNANDALE, D.Sc., C.M.Z.S., F.L.S., SUPERINTENDENT OF THE INDIAN MUSEUM,

AND OF

F. H. STEWART, M.A., D.Sc., M.B., SURGEON-NATURALIST TO THE INDIAN MARINE SURVEY.

Published under the Direction of Captain W. Lumsden, R.N.,
Director of the Royal Indian Marine.

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1909

Price One Rupee Eight Annas.

Sold by the Superintendent of the Indian Museum.

EXPLANATION OF PLATES.

MOLLUSCA.

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4. Nucula bengalensis, E. A. Smith. 5. Nucula donaciformis, E. A. Smith.

S.C. Mondul, del.

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EXPLANATION OF PLATES.

MOLLUSCA.

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1.

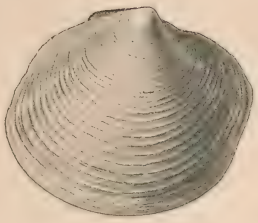

1a.


2 × 3.


2a × 3.


3.


3a.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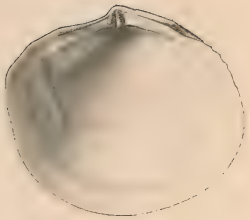
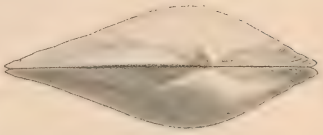

4a.


5.


5a.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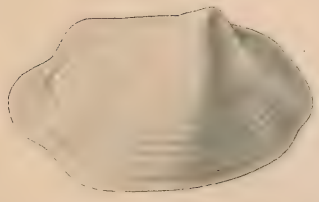
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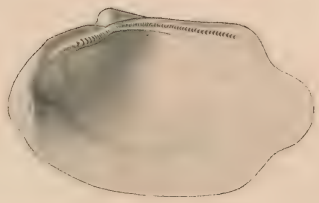
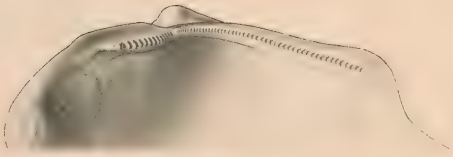
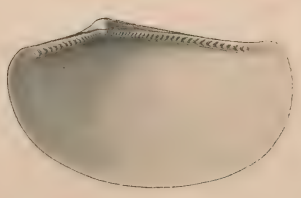

6a.


6b.


7.


7a.


7b.

1. Amussium andamanicum, E. A. Smith. 2. Amussium solitarium, E. A. Smith. 3. Amussium alcocki, E. A. Smith.
4. Lucina bengalensis, E. A. Smith. 5. Glauconome sculpta, Sowb. 6. Yoldia angulata, Sowb.
7. Malletia conspicua, E. A. Smith.

S. C. Mondul del. Photo-etching - Survey of India Offices, Calcutta, July 1897.

EXPLANATION OF PLATES.

MOLLUSCA.

PLATE III.

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Figs. 8, 8a.—*Abra convexior*, E. A. Smith, Annals and Magazine of Natural History, (6) XVI. July, 1895, p. 10.

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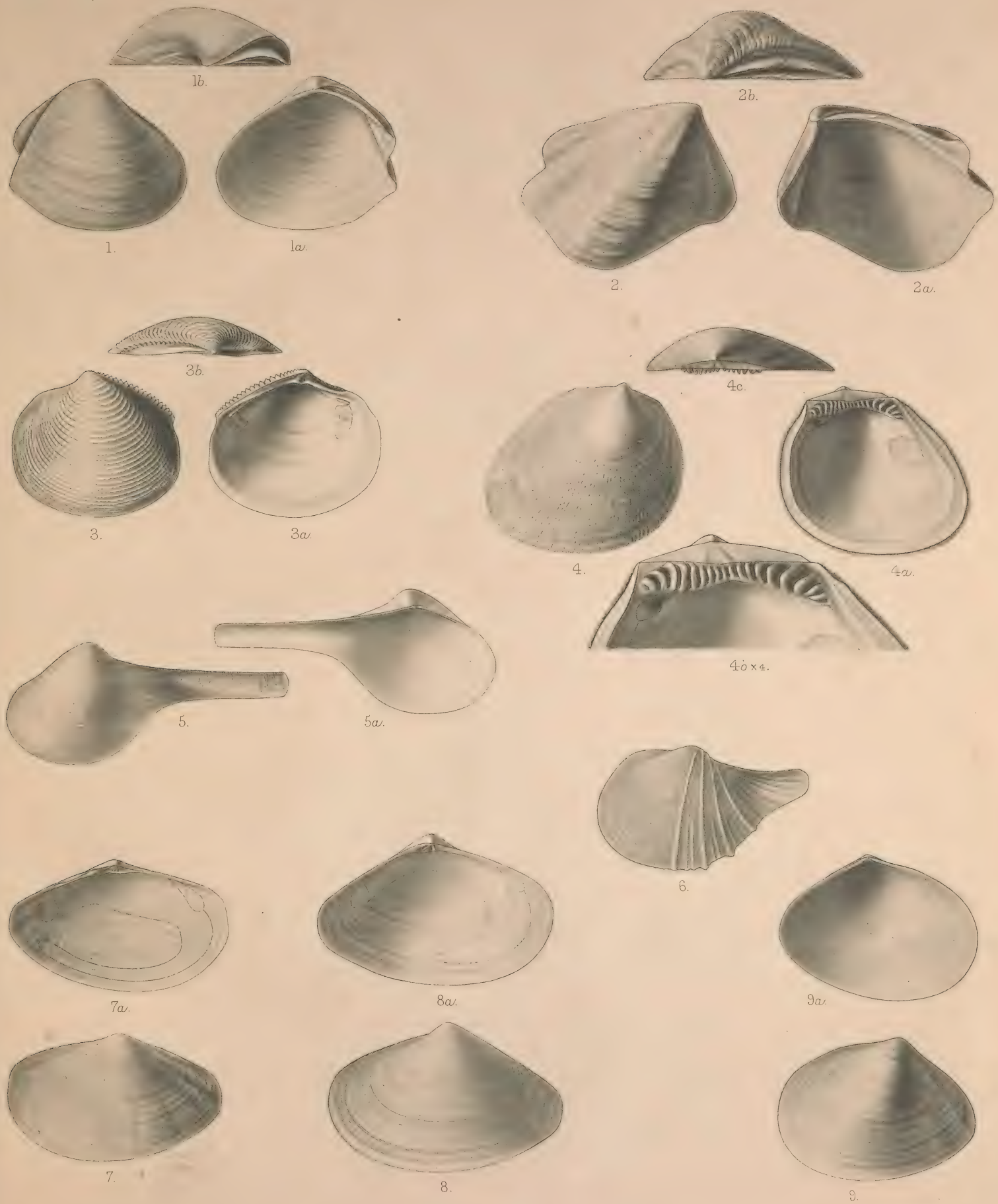
* *Syndesmya maxima.*



1. Cryptodon acuticarinatus, E. A. Smith, × 2½. 2. Cryptodon investigatoris, E. A. Smith, × 1½. 3. Lucina spinifera, Montagu, × 2½.
4. Limopsis indica, E. A. Smith × 2. 5. Cuspidaria macrorhynchus, E. A. Smith, × 3. 6. Cuspidaria alcocki, E. A. Smith, × 3.
7. Abra maxima, Sowb, × 1½. 8. Abra convexior, E. A. Smith, × 3. 9. Tellina parvula, E. A. Smith, × 3.

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EXPLANATION OF PLATES.

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PLATE IV.

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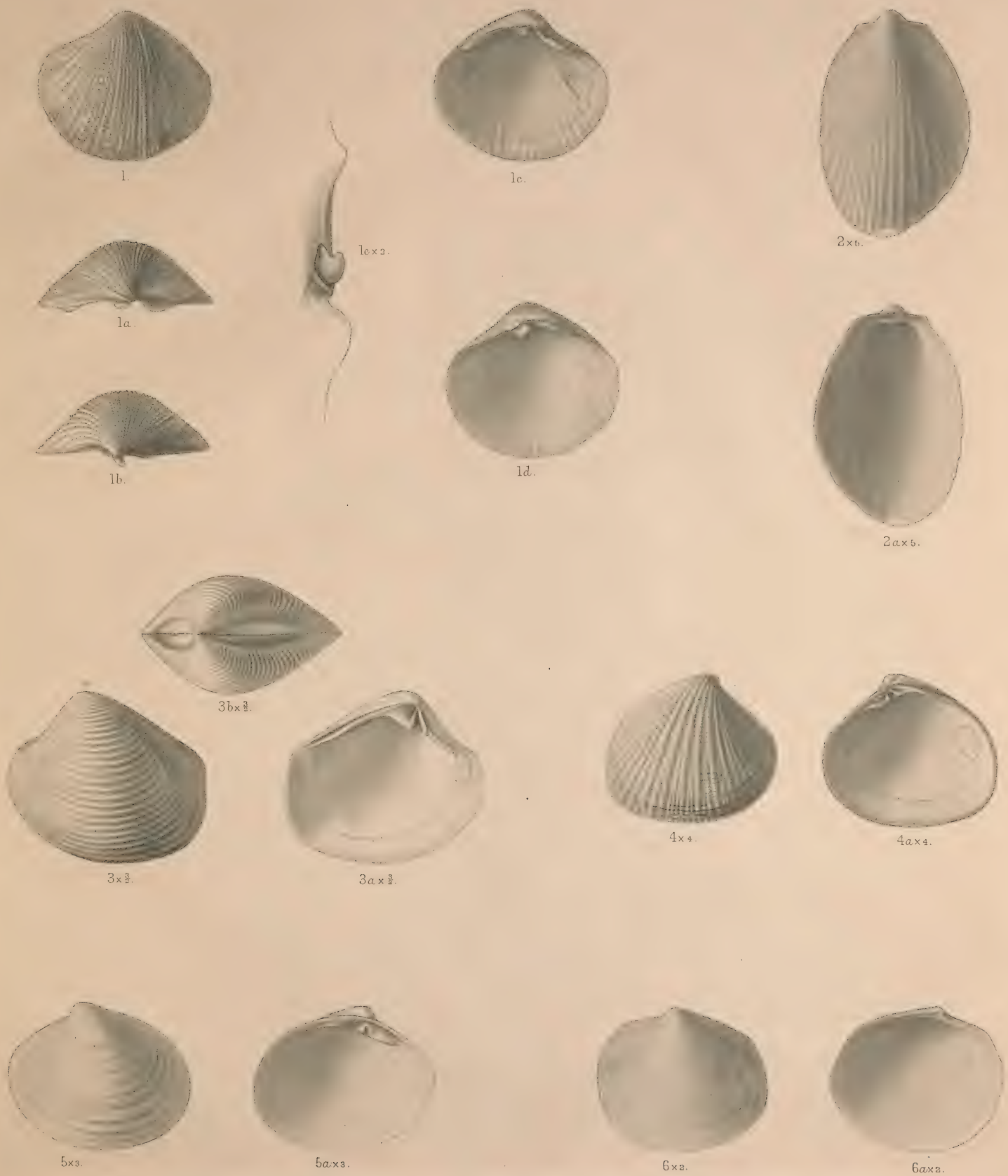

1. Verticordia (Euciroa) eburnea, W. M. & A. le ×2. 2. Lima subtilis, E. A. Smith ×5. 3. Crassatella indica, E. A. Smith ×$\frac{3}{2}$.
4. Venus juvenilis, E. A. Smith ×4. 5. Cytherea (Caryatis) pudicissima, E. A. Smith ×3. 6. Cryptodon philippinarum, Hanley ×2.

S. C. Mondul, del.

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EXPLANATION OF PLATES.

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PLATE V.

Figs. 1, 1a.—*Pontiothauma mirabile*, E. A. Smith, Annals and Magazine of Natural History, (6), XVI. July, 1895, p. 2.

Figs. 2, 2a.—*Pontiothauma abyssicola*, E. A. Smith, Annals and Magazine of Natural History, (6), XIV. July, 1895, p. 3.

1.

1a.

2.

2a.

1. Pontiothauma mirabile, E. A. Smith.

2. Pontiothauma abyssicola, E. A. Smith.

S. C. Mondul del.

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EXPLANATION OF PLATES.

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PLATE VI.

Figs. 1, 1a, 1b.—*Murex malabaricus*, E. A. Smith, Annals and Magazine of Natural History, (6), XIV. September, 1894, p. 162.

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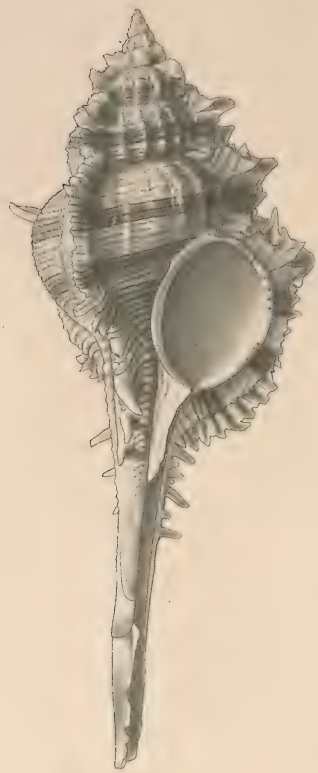
1.

1b.



1a.

2.

2a.

1. Murex malabaricus, E.A. Smith. 2. Pirula investigatoris, E.A. Smith.

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1898.

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Figs. 5, 5a.—*Dentalium magnificum*, E. A. Smith, Annals and Magazine of Natural History, (6) XVIII, 1896, p. 371.

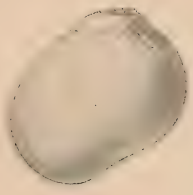
Figs. 6, 6a.—*Cardium* (*Fragum*) *simillimum*, E. A. Smith, Annals and Magazine of Natural History, (6) XVIII, 1896, p. 372.

1×2.

1a×2.

2×2.

2a×2.

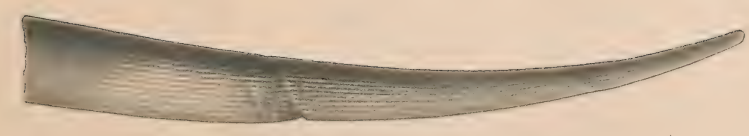


3×3.

3a×3.

4×2.

4a×2.



5.

6×2.

5a.

6a×2.

1, Pleurotoma (Ancistrosyrinx) travancorica, E. A. Smith. 2, Pleurotoma (Surcula) profundorum, E. A. Smith.
3, Natica (Lunatia) abyssicola, E. A. Smith. 4, Natica (Lunatia) livis, E. A. Smith.
5, Dentalium magnificum, E. A. Smith. 6, Cardium Fragum simillimum, E. A. Smith.

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Photo-etching.

Survey of India Offices, Calcutta, August, 1898.

EXPLANATION OF PLATES.

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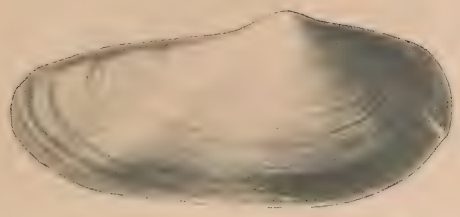
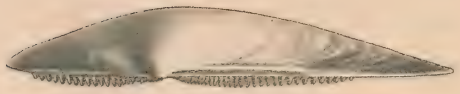
Figs. 4, 4a.- *Scrobicularia ceylonica*, E. A. Smith, Annals and Magazine of Natural History, (6) XVIII, 1896, p. 375.



1 × 1½.

1a × 1½.

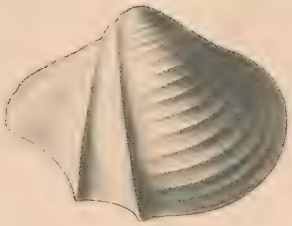
1b × 3.



1c × 1½.

2 × 3.

2a × 3.



3 × 3.

3a × 3.

4 × 2.

4a × 2.

1. Yoldia anatina, E. A. Smith. 2. Cuspidaria approximata, E. A. Smith.
3. Myonera bicarinata, E. A. Smith. 4. Scrobicularia ceylonica, E. A. Smith.

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EXPLANATION OF PLATE.

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PLATE IX.

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Figs. 3, 3a.—*Pleurotoma (Surcula) breviplicata*, E. A. Smith, *loc. admodum cit.*

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Figs. 6, 6a.—*Pleurotoma (Surcula) arcana*, E. A. Smith, *loc. admodum cit.*

1x2.

1ax2

2x1½.

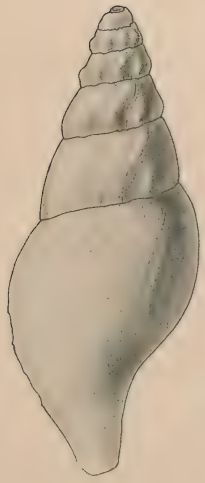
2ax1½.

3x2½.

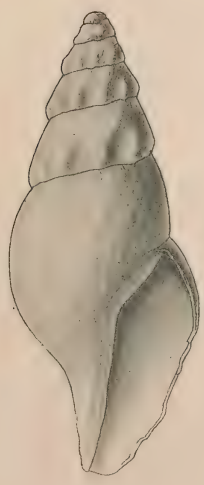
3ax2½.

4x1½.

4ax1½.



5x2



5ax2.

6x3.

6ax3.

1. Pleurotoma optata. 2. Pleurotoma oldhami. 3. Pleurotoma (surcula) breviplicata. 4. Pleurotoma (surcula) eurina.
5. Pleurotoma (surcula) praecipua. 6. Pleurotoma (surcula) arcana.

S. C. Mondul, del.

Photogravure, Survey of India Offices, Calcutta, August 1901.

EXPLANATION OF PLATE.

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PLATE X.

Figs. 1, 1a.—*Drillia investigatoris*, E. A. Smith, Annals and Magazine of Natural History, series 7, Vol. IV. October, 1899, p. 240.

Fig. 2.—*Drillia captiva*, E. A. Smith, *loc. admodum cit.*

Fig. 3.—*Drillia capta*, E. A. Smith, *loc. admodum cit.*

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Figs. 5, 5a.—*Trophon indicus*, E. A. Smith, *loc. admodum cit.*

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Figs. 8, 8a.—*Fusus captivus*, E. A. Smith, *loc. admodum cit.*

1. Drillia investigatoris. 2. Drillia captiva. 3 Drillia capta. 4. Trophon tenuirostratus. 5. Trophon indicus.
6. Nassaria laevior. 7. Tritonidea delicata. 8. Fusus captivus.

S. C. Mondul. del.

Photogravure. Survey of India Offices, Calcutta, September 1901.

EXPLANATION OF PLATE.

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PLATE XI.

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Figs. 3, 3a.—*Nassa diluta*, E. A. Smith, *loc. admodum cit.*

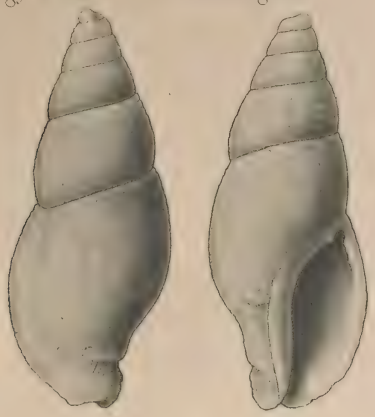
Figs. 4, 4a.—*Ancilla leucospira*, E. A. Smith, *tom. cit.*, p. 245.

Figs. 5, 5a.—*Cancellaria cretacea*, E. A. Smith, *loc. admodum cit.*

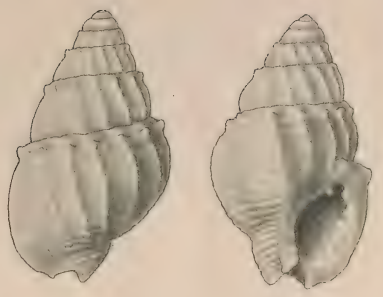
Figs. 6, 6a.—*Ancilla glans*, E. A. Smith, *tom. cit.*, p. 246.

Figs. 7, 7a.—*Columbella (Mitrella) supraplicata*, E. A. Smith, *tom. cit.*, p. 244.

Figs. 8, 8a.—*Coralliophila indica*, E. A. Smith, *loc. admodum cit.*

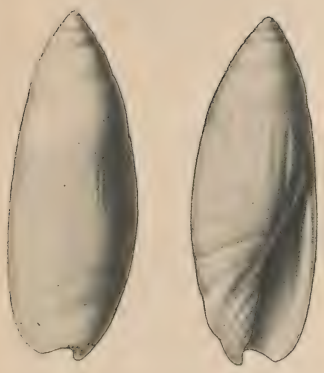


1x3. 1ax3.

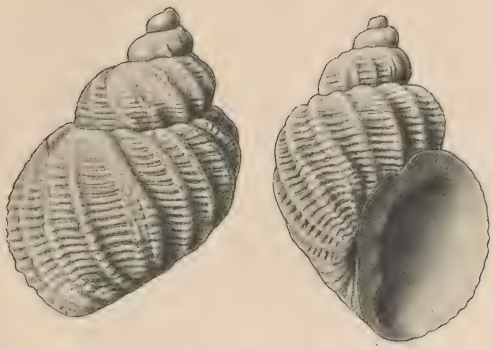


2x6. 2ax6.

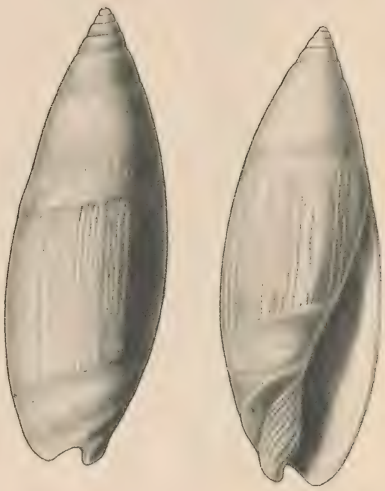
3x4. 3ax4.



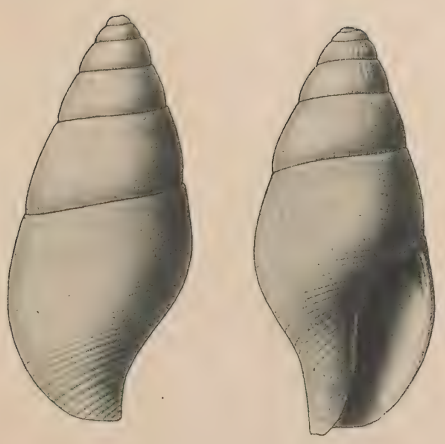
4x4. 4ax4



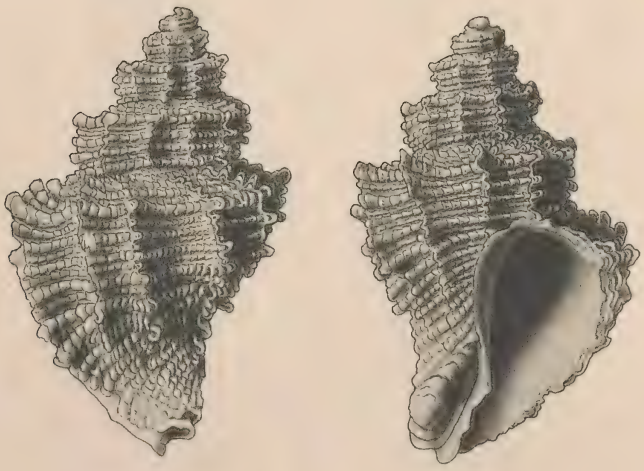
5x2. 5ax2.



6x2. 6ax2.



7x5. 7ax5.



8x2½. 8ax2½.

1. Pisania angusta. 2. Nassa aracanensis. 3. Nassa diluta. 4. Ancilla leucospira. 5. Cancellaria cretacea.
6. Ancilla glans. 7. Columbella (Mitrella) supraplicata. 8. Coralliophila indica.

S.C. Mondul, del.

Photogravure, Survey of India Offices, Calcutta, September 1901.

EXPLANATION OF PLATE.

MOLLUSCA.

PLATE XII.

Figs. 1, 1a.—*Scalaria bengalensis*, E. A. Smith, Annals and Magazine of Natural History, series 7, Vol. IV, October, 1899, p. 246.

Figs. 2, 2a.—*Scalaria subcasta*, E. A. Smith, *loc. admodum cit.*

Figs. 3, 3a.—*Leptothyra delecta*, E. A. Smith, *tom. cit.*, p. 248.

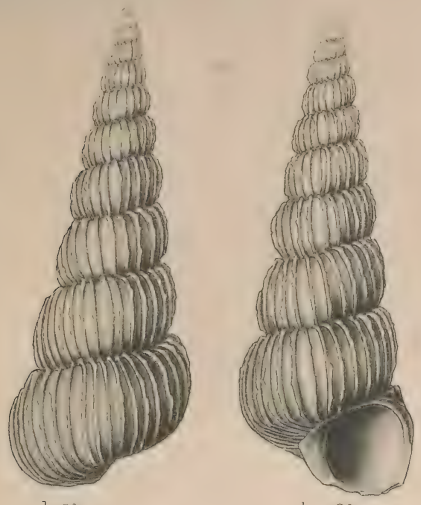
Figs. 4, 4a-c.—*Astralium bathyraphe*, E. A. Smith, *tom. cit.*, p. 247.

Figs. 5, 5a.—*Turbo incoloratus*, E. A. Smith, *loc. admodum cit.*

Figs. 6, 6a-b.—*Solariella oxycona*, E. A. Smith, *tom. cit.*, p. 248.

Figs. 7, 7a.—*Puncturella (Cranopsis) indica*, E. A. Smith, *tom. cit.*, p. 249.

Figs. 8, 8a.—*Fissurella delicata*, E. A. Smith, *loc. admodum cit.*


1x2¾.

1a x2¾.


2x3.


2a x3.

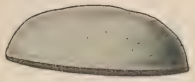

3x3.

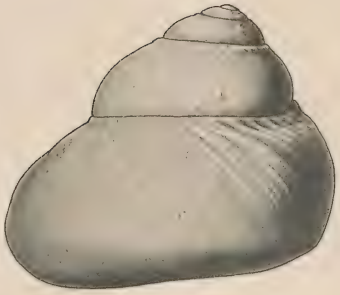

3a x3.


4x1½.

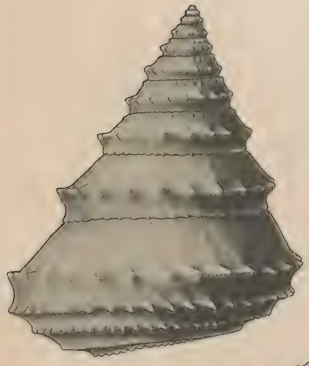

4a x1½.


4b x2.


4c x2.

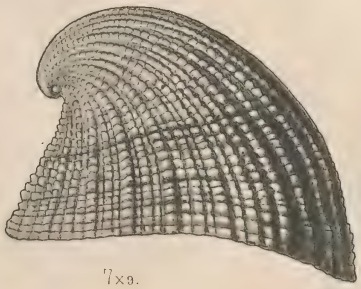

5x5.

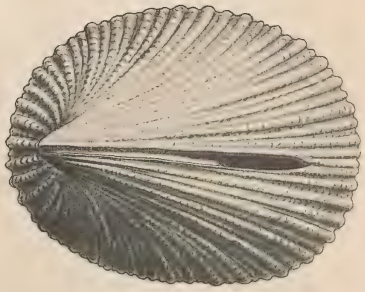

5a x5.

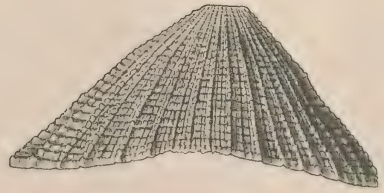

6x2¾.

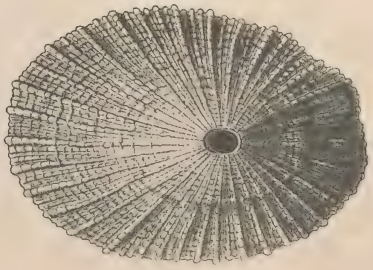

6a x2¾.


6b x2¾.


7x9.


7a x9.


8x2.


8a x2.

1. Scalaria bengalensis. 2. Scalaria subcasta. 3. Leptothyra delecta. 4. Astralium bathyraphe. 5. Turbo incoloratus.
6. Solariella oxycona. 7. Puncturella (Cranopsis) indica. 8. Fissurella delicata.

S.C. Mondul, del.

Photogravure, Survey of India Offices, Calcutta, October 1901.

EXPLANATION OF PLATE.

MOLLUSCA.

PLATE XIII.

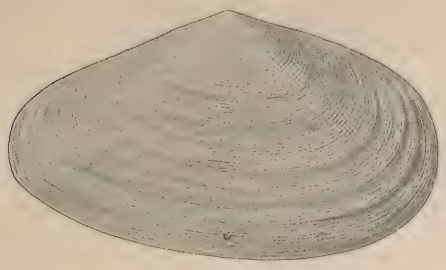
Figs. 1, 1a.—*Tellina travancorica*, E. A. Smith, Annals and Magazine of Natural History, series 7, Vol. IV, October, 1899, p. 249.

Figs. 2, 2a.—*Abra affinis*, E. A. Smith, *tom. cit.*, p. 250.

Figs. 3, 3a.—*Arca (Barbatia) incerta*, E. A. Smith, *tom. cit.*, p. 251.

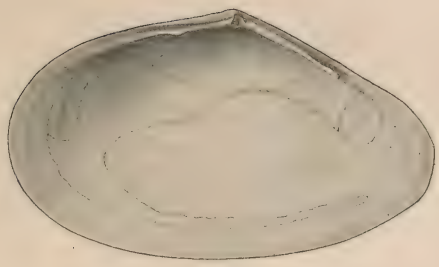
Figs. 4, 4a.—*Lima indica*, E. A. Smith, *loc. admodum cit.*

Figs. 5, 5a.—*Myodora quadrata*, E. A. Smith, *tom. cit.*, p. 250.

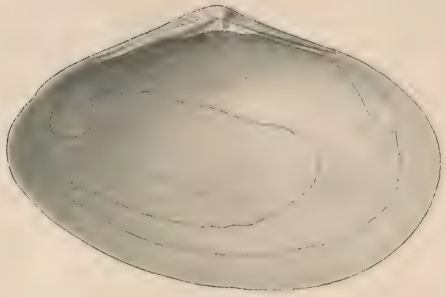


1x1½.

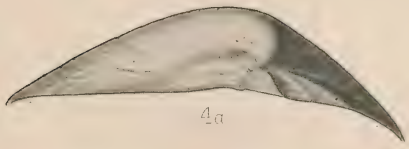
2x2½.



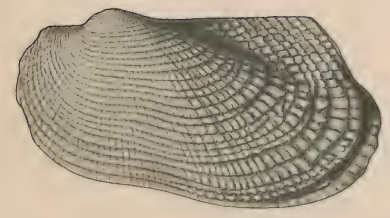
1a x 1½.



2a x 2½.

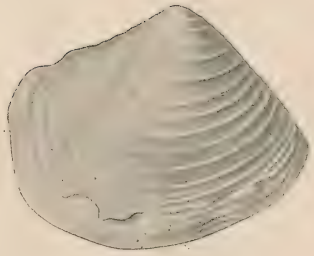


4a

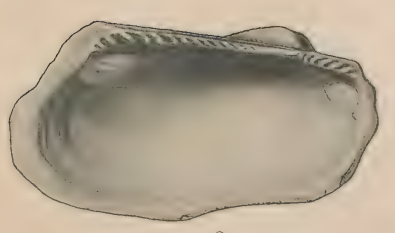


3 x 2½.

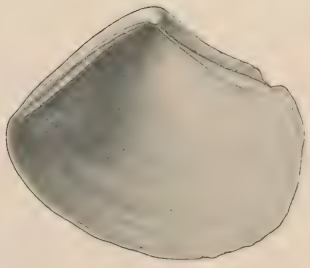
4



5x4.



3a x 2½



5a x 4

1. Tellina travancorica. 2. Abra affinis. 3. Arca (Barbatia) incerta. 4. Lima indica. 5. Myodora quadrata.

S.C. Mondul, del.

Photogravure, Survey of India Offices, Calcutta, July 1901.

EXPLANATION OF PLATE.

MOLLUSCA.

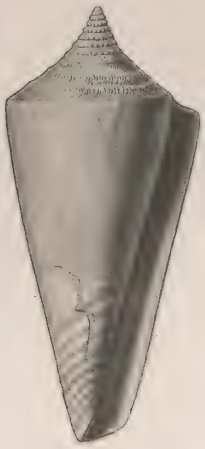
PLATE XIV.

Figs. 1, 1a.—*Conus semisulcatus*, Sowerby, Proc. Zool. Soc., 1870, p. 257; and E. A. Smith, Ann. Mag. Nat. Hist., Ser. 7, Vol. XIII, June, 1904, p. 454.

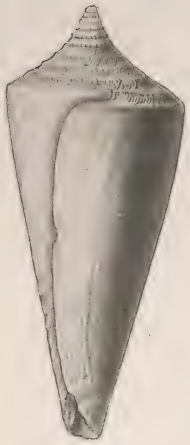
Figs. 2, 2a.—*Pleurotoma* (*Surcula*) *margaritæ*, E. A. Smith, Ann. Mag. Nat. Hist., Ser. 7, Vol. XIII, June, 1904, p. 458.

Figs. 3, 3a.—*Pleurotoma vagata*, E. A. Smith, *Op. cit.*, p. 456.

Figs. 4, 4a.—*Drillia worthingtoni*, E. A. Smith, *Op. cit.*, p. 460.



1.



1a.

2.

2a.

3.

3a.

4.

4a.

1. Conus semisulcatus, Sowb. × 2. 2. Pleurotoma (Surcula) Margaritae, E.A. Smith × 1⅔
3. Pleurotoma vagata, E.A. Smith, × 1⅓. 4. Drillia Worthingtoni, E.A. Smith, × 4.

Photogravure. Survey of India Offices, Calcutta, July 1906.

EXPLANATION OF PLATE.

MOLLUSCA.

PLATE XV.

Fig. 1.—*Latiaxis diadema* (A. Adams). E. A. Smith, Ann. Mag. Nat. Hist., Ser. 7, Vol. XIII, June, 1904, p. 466.

Murex diadema, A. Adams, Proc. Zool. Soc., 1853, p. 70.

Figs. 2, 2a.—*Clathurella perlissa*, E. A. Smith, Ann. Mag. Nat. Hist., Ser. 7, Vol. XIII, June, 1904, p. 460.

Figs. 3, 3a.—*Marginella grisea* (Jousseaume). E. A. Smith, Ann. Mag. Nat. Hist., Ser. 7, Vol. XIII, June, 1904, p. 468.

Persicula grisea, Jousseaume, Rev. Mag. Zool., 1875, p. 268.

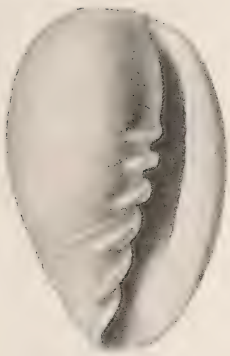
Figs. 4, 4a.—*Lacuna globosa*, E. A. Smith, Ann. Mag. Nat. Hist., Ser. 7, Vol. XIII, June, 1904, p. 472.

Figs. 5, 5a.—*Chiton ceylanicus*, E. A. Smith, Ann. Mag. Nat. Hist., Ser. 7, Vol. XIV, July, 1904, p. 7.

1.

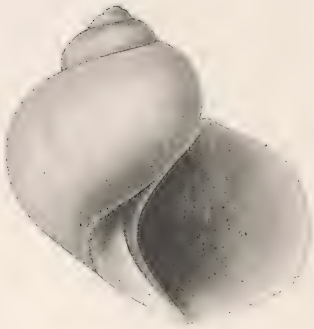
2.

2a.

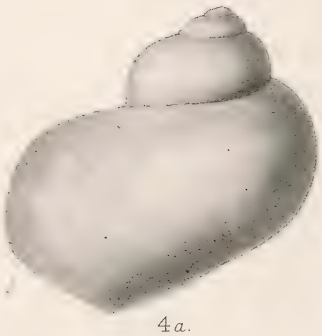


3.

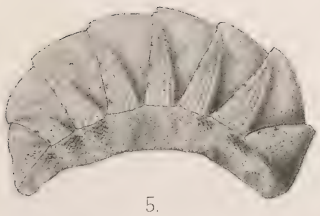
3a.



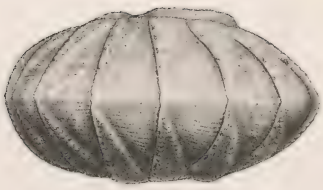
4.



4a.



5.



5a.

1. Latiaxis diadema, A. Adams, × 3. 2. Clathurella perlissa, E. A. Smith, × 5. 3. Marginella grisea, Jouss, × 2½. 4. Lacuna globosa, E. A. Smith, × 10.
5. Chiton ceylanicus, E. A. Smith, × 4.

Photogravure. Survey of India Offices, Calcutta, August 1906.

EXPLANATION OF PLATE.

MOLLUSCA.

PLATE XVI.

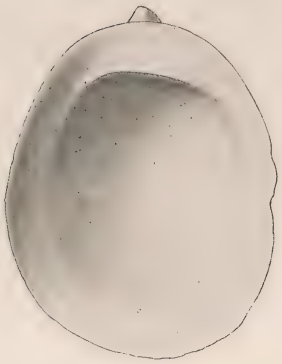
Figs. 1, 1a, 1b.—*Capulus fragilis*, E. A. Smith, Ann. Mag. Nat. Hist., Ser. 7, Vol. XIV, July, 1904, p. 1.

Figs. 2, 2a.—*Scaphander ceylanica*, E. A. Smith, *Op. cit.*, p. 5.

Figs. 3, 3a, 3b.—*Acmæa minutissima*, E. A. Smith, *Op. cit.*, p. 4.

1.

1a.



1b

2.

2a.

3.

3a.

3b.

1. Capulus fragilis, E. A. Smith, × 4. 2. Scaphander ceylanica, E. A. Smith, × 6.
3. Acmæa minutissima, E. A Smith, × 16.

Photogravure Survey of India Offices, Calcutta, January 1907

EXPLANATION OF PLATE.

MOLLUSCA.

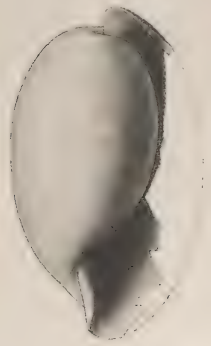
PLATE XVII.

Figs. 1, 1a.—*Atys submalleata*, E. A. Smith, Ann. Mag. Nat. Hist., Ser. 7, Vol. XIV, July, 1904, p. 6.

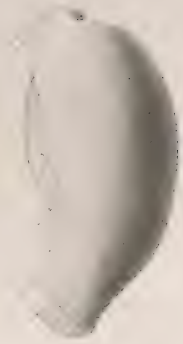
Figs. 2, 2a.—*Cylichna andamanica*, E. A. Smith, *Op. cit.*, p. 6.

Figs. 3, 3a.—*Xylophaga indica*, E. A. Smith, *Op. cit.*, p. 7.

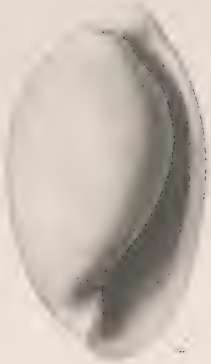
Figs. 4, 4a, 4b, 4c.—*Vesicomya indica*, E. A. Smith, *Op. cit.*, p. 9.



1.

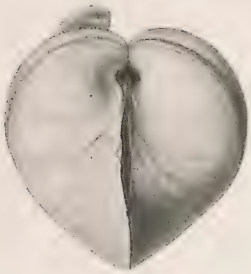


1a.

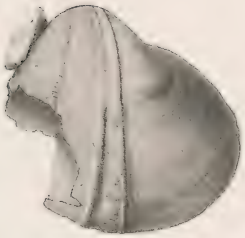


2.

2a.

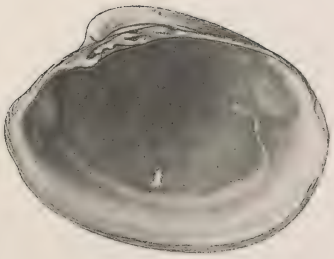


3.

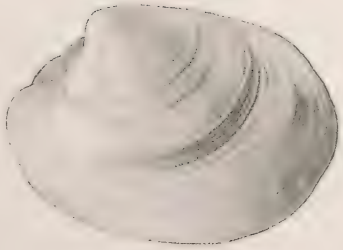


3a.

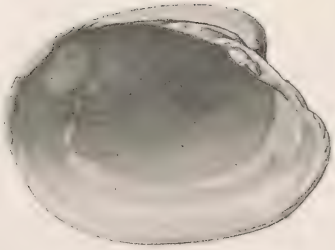
4a.



4.



4b.



4c.

1. Atys submalleata, E.A. Smith x 3. 2. Cylichna andamanica, E.A. Smith x 6. 3. Xylophaga indica, E.A. Smith x 3. 4. Vesicomya indica, E.A. Smith.

S.C. Mondul, del.

Photogravure, Survey of India Offices, Calcutta, June, 1906.

EXPLANATION OF PLATE.

MOLLUSCA.

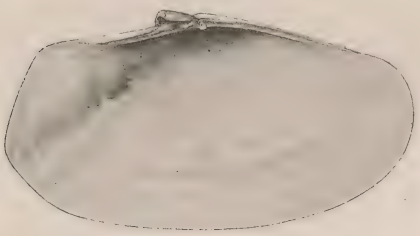
PLATE XVIII.

Figs. 1, 1a.—*Psammobia arakanenis*, E. A. Smith, Ann. Mag. Nat. Hist., Ser. 7, Vol. XIV, July, 1904, p. 10.

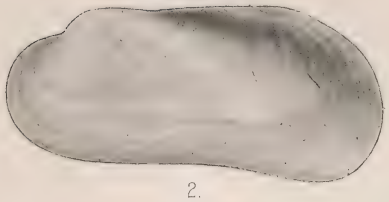
Figs. 2, 2a.—*Myrina indica*, E. A. Smith, *Op. cit.*, p. 11.

Figs. 3, 3a.—*Anatina andamanica*, E. A. Smith, *Op. cit.*, p. 8.

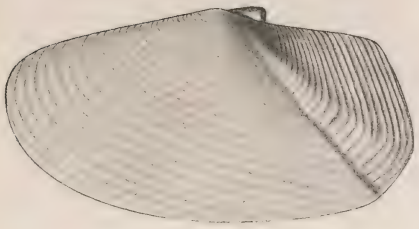
Figs. 4, 4a, 4b.—*Pecten alcocki*, E. A. Smith, *Op. cit.*, p. 13.



1.

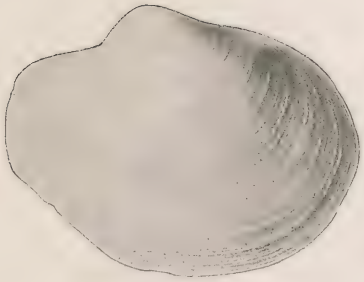


2.

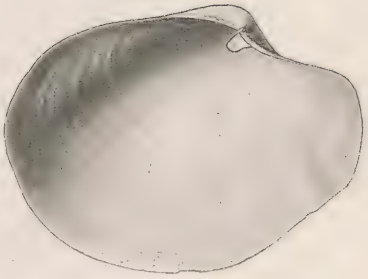


1a.

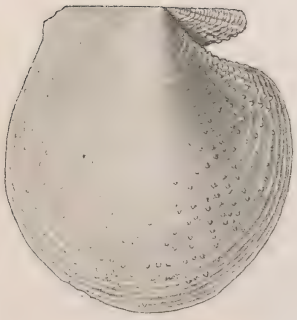
2a.



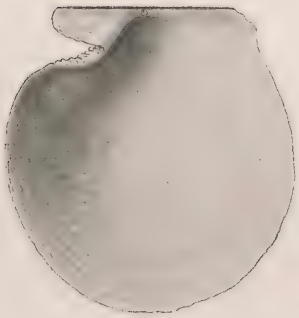
3.



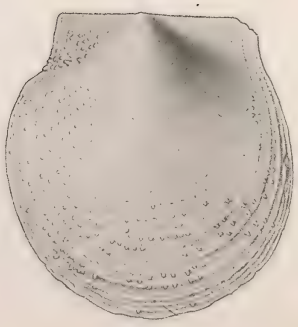
3a.



4.



4a.



4b.

1. Psammobia arakanensis, E. A. Smith x 2. 2. Myrina indica, E. A. Smith x 5. 3. Anatina andamanica, E. A. Smith x 3. 4. Pecten alcocki, E. A. Smith x 2½.

S. C. Mondul, del.

Survey of India Offices, Calcutta, July, 1906.

M.O – Pl. V, Pls. xix–xx
1908

EXPLANATION OF PLATE.

PLATE XIX—MOLLUSCA.

Figs. 1, 2.—NATICA DIMIDIATA, E. A. Smith.

Natica dimidiata, *E. A. Smith, Ann. Mag. Nat. Hist.* (7), Vol. XVIII, p. 172 (1906).

Figs. 3, 4.—NATICA INCERTA, E. A. Smith.

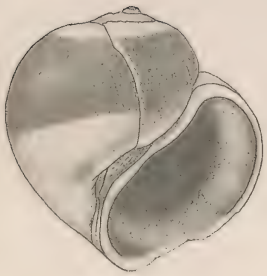
Natica incerta, *E. A. Smith, op. cit.*, p. 173.

Figs. 5, 6.—SCAPHANDER VICINUS, E. A. Smith.

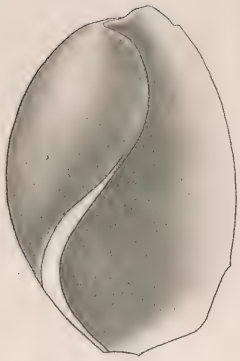
Scaphander vicinus, E. A. Smith, *Ann. Mag. Nat. Hist., tom. cit.*, p 248.

Figs. 7, 8.—SCAPHANDER ANDAMANICUS, E. A. Smith.

Scaphander andamanicus, *E. A. Smith, Ann. Mag. Nat. Hist.*, (6), Vol. XIV, p. 167, pl. IV, fig. 15 (1894); series 7, Vol. XIV, p. 5 (1904) and Vol. XVIII, p. 247 (1906).



1.



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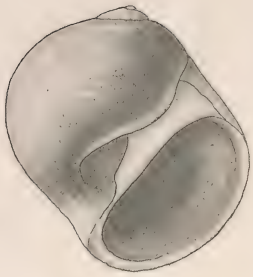

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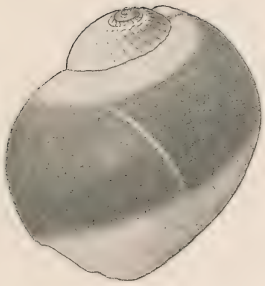
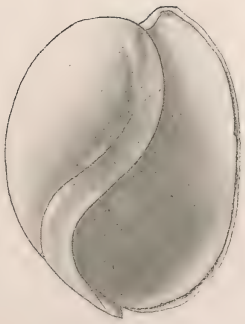


2.

6.

4.



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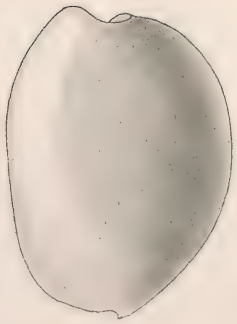


8.

1. 2. Natica dimidiata, Smith. x 2.
3. 4. Natica incerta, Smith. x 1½.
5. 6. Scaphander vicinus, Smith. x 1½.
7. 8. Scaphander andamanicus, Smith. x 1½.

A.C. Chowdhary, del.

Photogravure. Survey of India Offices, Calcutta. March 1908.

EXPLANATION OF PLATE.

PLATE XX—MOLLUSCA.

Figs. 1, 2.—PLEUROTOMA (SURCULA) THISBE, E. A. Smith.

Pleurotoma thisbe, *E. A. Smith, Ann. Mag. Nat. Hist.* (7), Vol. XVIII, p. 162 (1906).

Figs. 3, 4.—PLEUROTOMA CARINATA, Gray.

Pleurotoma carinata, Gray, *E. A. Smith, Ann. Mag. Nat. Hist.* (6), Vol. XXIII, p. 368 (1896), and (7), Vol. XVIII, p. 160 (1906).

Figs. 5, 6.—ANCILLA ALCOCKII, E. A. Smith.

Ancilla alcockii, *E. A. Smith, Ann. Mag. Nat. Hist.* (7), Vol. XVIII, p. 172 (1906).

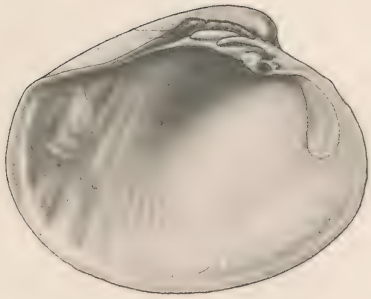
Figs. 7, 8.—VESICOMYA BREVIS, E. A. Smith.

Vesicomya brevis, *E. A. Smith, op. cit*, p. 261.

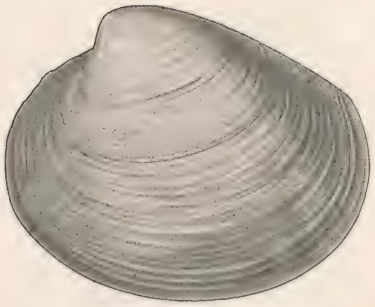
1.

5.

2.



7.



8.

3.

6.

4.

1. 2. Pleurotoma (surcula) thisbe, Smith. x 2.
3. 4. Pleurotoma carinata, Gray. x 1½.
5. 6. Ancilla alcockii, Smith. x 1½.
7. 8. Vesicomya brevis, Smith. x 1½.

A. C. Chowdhary, del.

Photogravure - Survey of India Offices, Calcutta, March 1908.

EXPLANATION OF PLATE.

PLATE XXI—MOLLUSCA.

Figs. 1, 1a.—PONTIOTHAUMA MINUS, E. A. Smith.
Pontiothauma minus, *E. A. Smith, Ann. Mag. Nat. Hist.* (7), Vol. XVIII, p. 159 (1906).

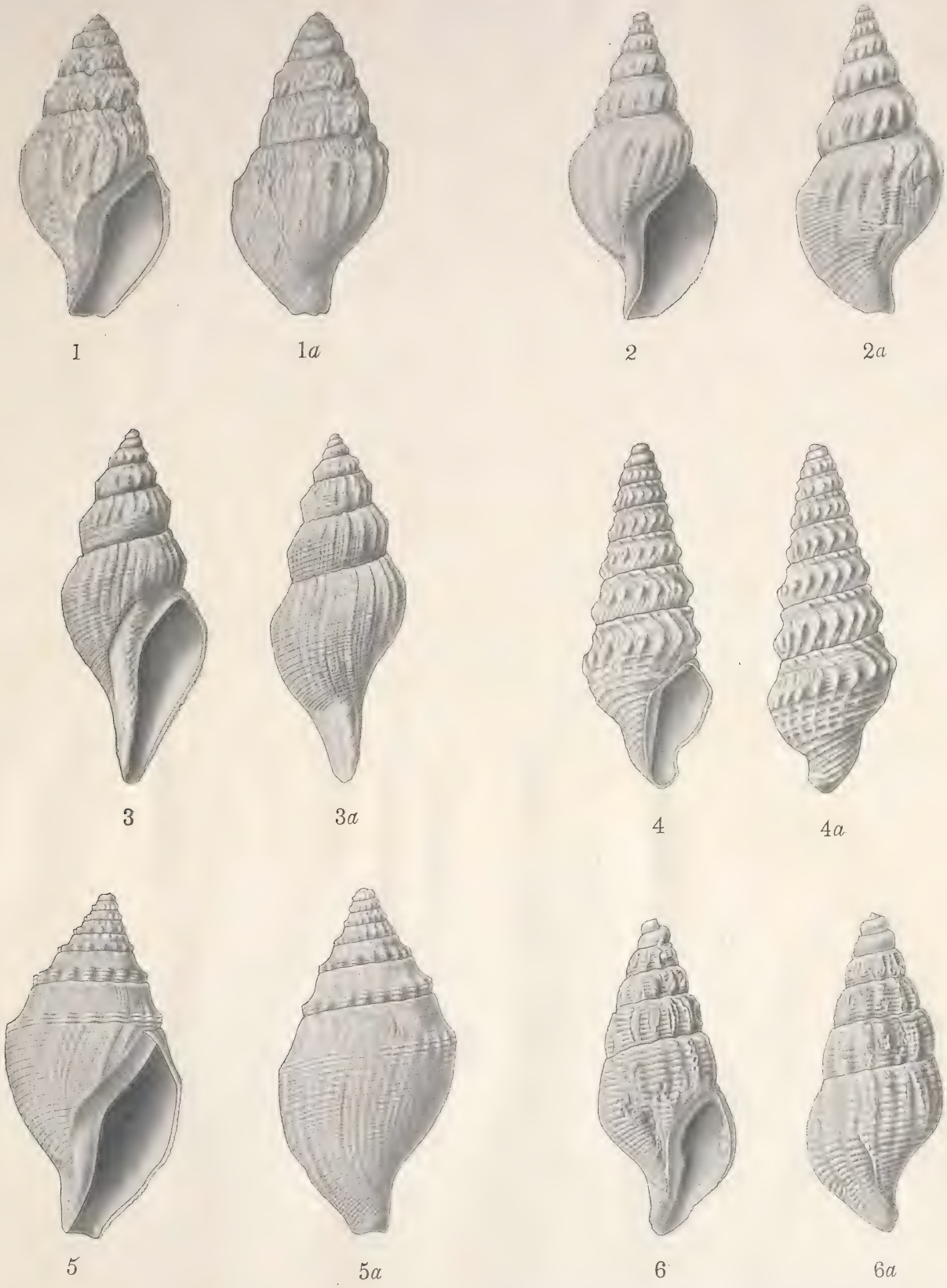
Figs. 2, 2a.—PONTIOTHAUMA PACEI, E. A. Smith.
Pontiothauma pacei, *E. A. Smith, op. cit.*, p. 159.

Figs. 3, 3a.—PLEUROTOMA (SURCULA) NEREIS, E. A. Smith.
Pleurotoma (Surcula) nereis, *E. A. Smith, op. cit.*, p. 161.

Figs. 4, 4a.—PLEUROTOMA (SURCULA) AGALMA, E. A. Smith.
Pleurotoma (Surcula) agalma, *E. A. Smith, op. cit.*, p. 162.

Figs. 5, 5a.—PLEUROTOMA (BATHYTOMA) URANIA, E. A. Smith.
Pleurotoma (Bathytoma) urania, *E. A. Smith, op. cit.*, p. 164.

Figs. 6, 6a.—MANARIA THURSTONI, E. A. Smith.
Manaria thurstoni, *E. A. Smith, op. cit.*, p. 167.



Half-tone.

Survey of India Offices, Calcutta, 1909.

1, 1*a*. Pontiothauma minus, Smith, × 2.

2, 2*a*. Pontiothauma pacei, Smith.

3, 3*a*. Pleurotoma (Surcula) nereis, Smith, × 2.

4, 4*a*. Pleurotoma (Surcula) agalma, Smith, × 4.

5, 5*a*. Pleurotoma (Bathytoma) urania, Smith, × 3.

6, 6*a*. Manaria thurstoni, Smith, × 2.

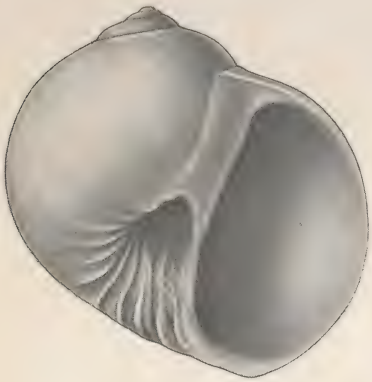
EXPLANATION OF PLATE.

PLATE XXII—MOLLUSCA.

Figs. 1, 1a.—NATICA SIMULANS, E. A. Smith.
Natica simulans, *E. A. Smith, Ann. Mag. Nat. Hist.* (7), Vol. XVIII, p. 173 (1906).

Figs. 2, 2a.—COLUMBELLA SUAVIS, E. A. Smith.
Columbella suavis, *E. A. Smith, op. cit.*, p. 171.

Figs. 3, 3a.—TROPHON (BOREOTROPHON) PLANISPINA, E. A. Smith.
Trophon (Boreotrophon) planispina, *E. A. Smith, op. cit.*, p. 168.

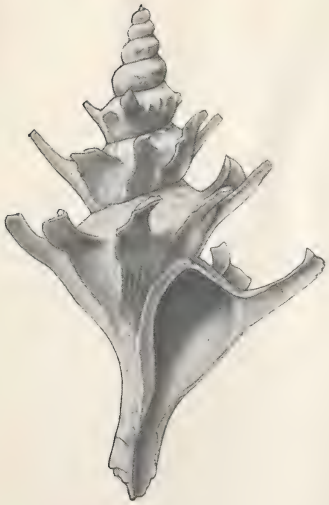


1

1*a*

2

2*a*



3

3*a*

Half-tone. Survey of India Offices, Calcutta, 1909.

1, 1*a*. Natica simulans, Smith, × $2\frac{1}{2}$. 2, 2*a*. Columbella suavis, Smith, × 12.

3, 3*a*. Trophon (Boreotrophon) planispina, Smith, × 2.

EXPLANATION OF PLATE.

PLATE XXIII—MOLLUSCA.

Figs. 1, 1a.—NUCULA (ACILA) GRANULATA, E. A. Smith.
Nucula (Acila) granulata, *E. A. Smith, Ann. Mag Nat. Hist.* (7), Vol. XVIII, p. 251 (1906).

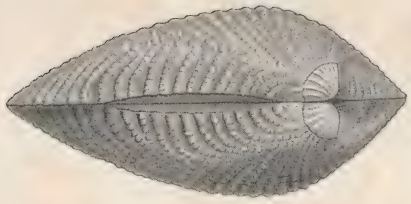
Figs. 2, 2a.—DENTALIUM CORNU-BOVIS, E. A Smith.
Dentalium cornu-bovis, *E. A. Smith, op. cit.*, p. 249.

N.B.—Figs. 2 and 2*a* with Symbiotic Actinian.

Fig. 3.—DENTALIUM SUBCURVATUM, E. A. Smith.
Dentalium subcurvatum, *E. A. Smith, op. cit.*, p. 251.

Figs. 4, 4a.—LEPIDOPLEURUS ANDAMANICUS, E. A. Smith.
Lepidopleurus andamanicus, *E. A. Smith, op. cit.*, p. 251.

1



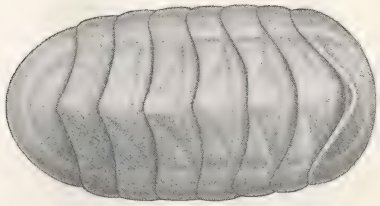
1*a*

2

2*a*

3

4



4*a*

Half-tone.

Survey of India Offices, Calcutta, 1909.

1, 1*a*. Nucula (Acila) granulata, Smith, × 4.

2, 2*a*. Dentalium cornu-bovis, Smith, × 1½.

3. Dentalium subcurvatum, Smith, × 1½.

4, 4*a*. Lepidopleurus andamanicus, Smith, × 5.