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(SOCIETY PAPER, No. 454.)

FOSSILS FROM SPRINGVALE, NEAR COUVA, TRINIDAD.

SECOND REPORT

IN CONTINUATION OF SOCIETY PAPER, No. 440.

BY

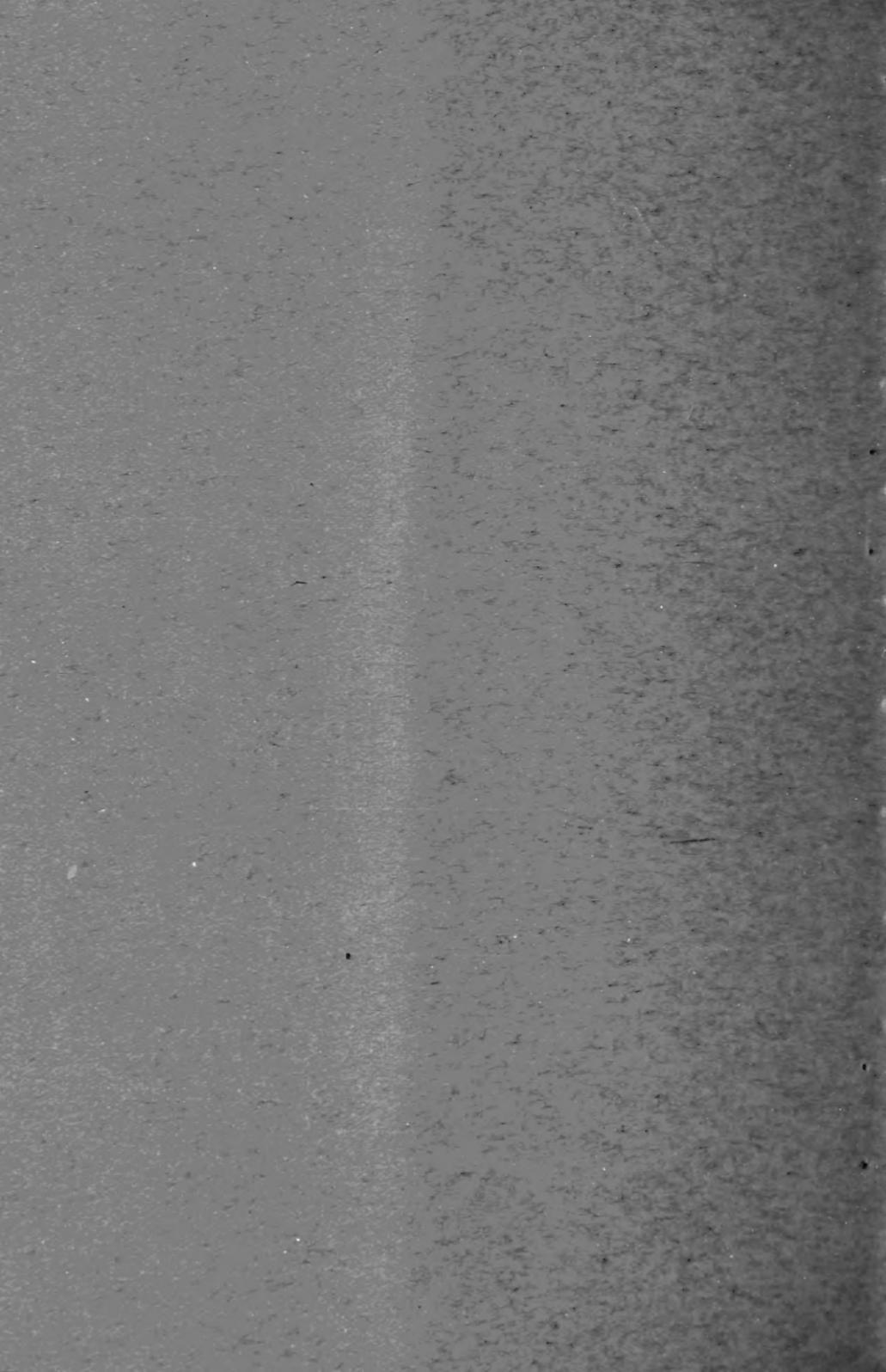
R. J. LECHMERE GUPPY,

Honorary Consulting Geologist to The Society.

Read before The Society, 17th January, 1911.

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Fossil deposit, Springvale, Couva.

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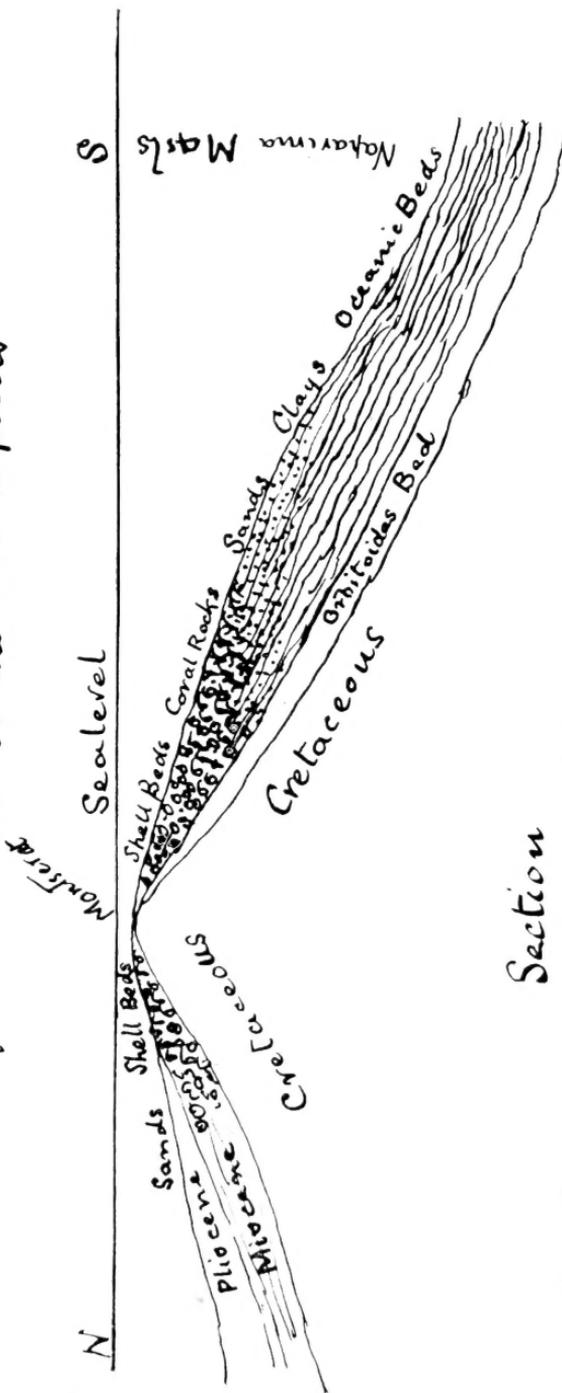
I have already made a first Report on the Springvale Fossils which has appeared in the Proceedings of The Society for November 1910, page 447. Under the Auspices of the Agricultural Society I visited the Springvale quarry on the 16th November, in company with Dr. Fredholm and others. The Road Officer, Mr. Todd, who is in charge of the quarry, gave us every assistance. This enabled me to glean some further information. The deposit is one of remarkable richness in fossil shells and the variety of species found in the one place is quite astonishing. The shells are generally well-preserved, but their fragility is such that many beautiful specimens go to pieces on handling or in transport. I found that the

difference in color of different samples of the bed, which I had previously, noticed, was due merely to oxidation, the portions of the bed near the surface being converted to a reddish-brown color, while the inner parts were grey. This is quite a common or rather almost universal change produced by the access of air and Water.

The quarry is situated on the side of a low hill, one of the lateral spurs of the Montserrat range. It is in a cacao wood and the neighbouring surfaces are covered with vegetation, so that it could only be with axe, pick and spade that further exploration could be made. I should think it likely that the deposit would be found to extend to a considerable distance. The material would be useful on a soil destitute of lime, but the soils in the immediate neighbourhood are fairly supplied with this substance. There are plenty of soils in the Couva district and neighbouring parts which would be improved by the addition of this fossiliferous rock. As a road material it may serve in default of better, but it would not be of any great durability, and could not stand heavy traffic.

I endeavored without success to obtain some information as to dip and strike and the relations of the bed to other beds in the neighbourhood. There was a kind of false bedding which obscured the real relations of the strata—but as no other beds were visible above or below I could not ascertain any other facts. Still in order to exhibit the relations of the strata I subjoin a diagram which I hope will assist in making the general relations clear. This shows that the Couva and Montserrat miocene shell deposits were in course of formation at the same time as the latter part of the oceanic deposits. The subsequent folding dislocation and upheaval have altered the apparent relations of the formations. Until we know the ground better, and have detailed information as to the outcrop, &c., of the geological formations we cannot give a more definite Section than this approximate one, which is only diagrammatic.

Diagram showing the general Relations of the Shell Beds to the other Deposits



Section

This Diagram represents the Beds as laid down and previous to their upheaval folding and Dislocation. (Vertical Scale much exaggerated)

The terms Eocene Miocene and Pliocene were originally fixed by Lyell for the three great divisions of the tertiary strata (see Principles of Geology 8th Ed. page 177 ; Elements 6th Ed. page 187 ; and Student's Manual 1878 page 122) in accordance with the percentage of recent species found in the formations so designated. The percentage test though fundamentally a useful one is not always free from difficulty in its application to particular cases, and the West Indian miocene formation is one of these cases. And this arises in some degree from the fact that the proportion of recent species varies with each observer. According to the list of names I give, amounting to about a hundred species, there are not more than three or four still-existing species in our miocene beds, and even these can easily be disposed of by giving them other names which in most cases are ready to hand. When we come to examine the shells we find a large number of them so near to living species that it is only by critical tests that we can separate them. But the recent Analogues of these shells resolve themselves into at least two categories, namely 1° species still living in the West Indies, and 2° species not now living in the West Indies. And we find the resemblances of the West Indian miocene shells are largely with Pacific and Indian species rather than with West Indian species. Many again are akin to European miocene species, so that when we compare the fossil Fauna as a whole we find it very unlike the recent West Indian Fauna.

It may be noted as regards this collection that litoral shells are absent from it.

At different times I determined Fossils for Mr. Cunningham Craig. Several of these had previously occurred to me in the Caroni beds of Savaneta and are included in my list already published. To complete the list of miocene fossils so far known I add the names of such as were not given in that list to those of the Springvale Fossils now recorded. These Fossils

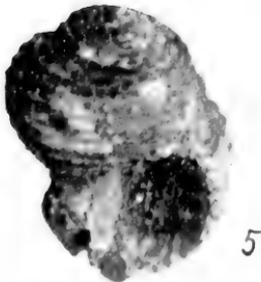
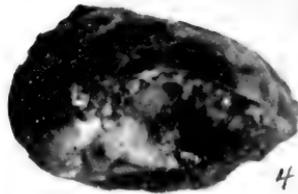
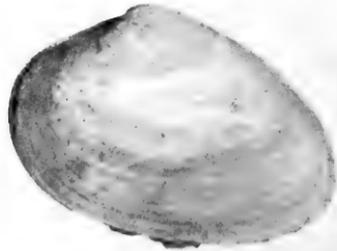
are additional evidence of the miocene age of the Springvale Savaneta and Montserrat beds and of the essential identity of their Fauna with that of the Bowden beds of Jamaica and the miocene formations of Haiti and Cumana.

ADDITIONAL LIST OF FOSSILS FROM SPRINGVALE, &C.

[In this list the same letters are used as in the former list in which, however, the letter P (page 451 line 9) should be D.]

MOLLUSKA—I GASTROPODA.

- Natica cuspidata* new species S.
Capulus efluens new species S.
Turritella tornata Guppy * S.J.H.
 apicalis Heilprin S.
Dentalium domingense Sow. * H.
Conus recognitus Guppy * S.H.J.
 stenostomus Sow. S.H.J.
Pleurotoma henekeni Sow. S.H.J.
 haitense Sow * H.J.
 venustum Sow. * S.H.J.
 squamosum Gab. D.
Glyphostoma dentiferum Gab. * H.
Casis sulcifera Sow. S.H.
Fusus haitensis Sow. * H.
Phos moorei Guppy * J.H.
Terebra sulcifera Sow. S.H.
Columbela venusta Sow. S.H.D.
Murex domingensis Sow. S.H.
Solenosteira semiglobosa n. sp. S.
 cochlearis n. sp. S.
Turbinelus scolymoides Dal. S.
Modulus turbinatus Heilpr. S.
Turbonila simplicior Guppy. D.



The Jacobson Studio.

2. CONCHIFERA.

- Raeta meridionalis* n. sp. S.
Crasatela melina Conr. S.J.
Cytherea juncea Guppy * S.J.
Cardium haitense Sow. * H.J.
Cardita scabricostata Guppy * J.
Pectunculus acuticostatus Sow. * H.J.
Arca taeniata Dall S.
Pecten lyonii Gab. S.H.
 soror Gab. S.H.
Placenta patinata new species near *orbicularis*

3. POLYZOON.

- Cupularia calyxglandis* Guppy *

NOTES ON THE SHELLS WITH DESCRIPTIONS OF THE
NEW SPECIES.

NATICA CUSPIDATA (new Species). Pl. 2. Fig. 4.

Shell moderately thick, smooth with lines of growth somewhat sinuate near the Suture-globose-depressed-ovate. Spire pointed—Whorls five or six. Callus large stout conical, impressed with a transverse sulcus—Umbilicus a narrow deep chink. Largest diameter 70 mm. Height 60 mm. Like *N. didyma* Bolton, with a similar but more developed Callus. The shell is more sigaretiform.

NATICA CANRENA Linn. The Miocene fossil is called *N. plicatela* by Conrad. See Dall, Flor. Foss. Part. I Page 364. The eastern Analogue is *N. alapapilionis* Chemn.

CAPULUS EFLUENS (new Species).

Shell obliquely spiral. Whorls rapidly increasing, fluted with longitudinal grooves separated by scarcely defined rounded

keels or ridges Spire small uncinata Aperture large. Length 20mm. Height 15mm.

The specimens are imperfect and not separable from the matrix, but they seem to deserve a name. The shell is similar in shape to *C. mitrula*, but it is distinguished by its larger longitudinal flutings. It recalls our old friend *C. vetustus*.

TURITELA TORNATA, Guppy—Journal Geological Society 1866, P. 580 Pl. xxvi, Fig. 12.

T. altirata Gab. and *gatunensis* Gab. appear to be synonyms.

This widely distributed and variable species has been redescribed as *F. gabii* by Toulou (Gatun Fossils, Tafel xxv (1) F. 5).

CONUS RECOGNITUS, Guppy—Journ. Geol. Soc. 1876 P. 527

C. solidus Sow. Journ. Geol. Soc. 1850 P. 45.

CONUS STENOSTOMUS Sow.—Journ. Geol. Soc. 1850 P. 44

Id. Guppy—Journ. Geol. Soc. 1866 P. 287

Pl. xvi Fig. 2.

C. catenatus Sow. l. c. P. 45 Pl. ix Fig. 2.

C. interstinctus Guppy l. c. P. 288 Pl. xvi F. 3.

? *C. sulculus* Dal. ? *C. planiceps* Heilprin

Compare also *C. haitensis*, *symetricus* and *domingensis* Sow. The variation among the cones is great and I think that we have already more names than species, consequently it is hard to find the right name for a specimen.

PLEUROTOMA VENUSTUM Sow.—Journ. Geol. Soc. 1850.

Page 50 Pl. x. Fig. 7. A single small specimen of the form of this I described as *Pl. jamaicense* (Journ. Geol. Soc. 1866 P. 290 Pl. xvi Fig. 6) occurs in the collection See Journ. Geol. Soc. 1876 Page 527.

PLEURCTOMA HENEKENI Sow. Journ. Geol. Soc. 1850 P. 50.

Pl. x. Fig. 6 (including *P. jaquense* Sow. and *P. longicaudata* and *P. humerosa* of Gabb).

Is allied to *Pl. belardii* of the European Miocene

CASIS SULCIFERA Sow. Journ. Geol. Soc. 1850 Page 47

Pl. x F. 1.

Fragments apparently belonging to this Species.

COLUMBELA VENUSTA Sow. Journ. Geol. Soc. 1850

P. 46 Pl. ix F. 6.

Metulela venusta Gab. J. A. N. S. Phil. 1972

Pl. xi F. 3.

SOLENOSTEIRA SEMIGLOBOSA (new Species. Pl. 2. Fig. 5, 6.)

Shell pyriform strongly lirate subrimate spirally tuberculate on the angle of the last Whorl. Spire pointed. Whorls about seven, carinate. Spiral liræ or keels subacute. Aperture ovate outer lip dentate—Columella Callus sometimes granulate.

Nearly allied to *Rapana* and *Rapa*, but on account of the differences I provisionally use Dall's generic name *Solenosteira* (Florida Fossils Part I P. 122).

SOLENOSTEIRA COCHLEARIS (new Species. Pl. 2. Fig. 3.)

Shell solid subpyriform rimate spirally lirate tuberculate on the angle of the whorls. Keels or Liræ strongly subacute, triple or quadruple, crossed by strong rather irregular lines

of growth. Aperture ovate. Lip strongly dentate. Callus rather thin. Spire (imperfect probably) rather conic. Canal moderately long.

This is more purpuroid and less globose than *S. semiglobosa*, and the tubercles on the angle of the whorl are not confined to the last whorl. I assign it to Dall's genus for the same reason as the last. I would not undertake to say without further study in what group these shells should definitively be placed.

MUREX CORNURECTUS Guppy Journ. Geol. Soc. 1876

P. 521 Pl. xxviii F. 4.

It is closely related to *M. mo-quinianus* Duval of West Coast of Africa (teste Petit) Journ. de Conch. 1853 Page 203 Pl. v. F. 4

TEREBRA SULCIFERA Sow. Journ. Geol. Soc. 1850 P. 47

Guppy Journ Geol Soc. 1876 Page 525 Pl. xxix Fig 8.

T. bipartita Sow. and *inaequalis* Sow are synonyms.

RAETA MERIDIONALIS new Species. Pl. 2 Fig. 1.

Oval-oblong rather rostrate somewhat inflated medially concentrically sulcate with smaller lines or grooves between the larger ones.

There are no means of getting at the hinge of the single imperfect example. The proportions appear to be slightly more elongate than those of *R. canaliculata* (Adams, Gen. Moll. Pl. cii Fig. 4.)

CRASATELA MELINA Conrad. Dall, Florida Fossils Part V,

Pl. xxxvii Fjg. 6.

Cr. marylandica Guppy Proc. U.S. National Museum 1896

Compare also *Cr. jamaicensis* Dal. Flor. Foss. Part vi
Page 1471, Pl. xlix Fig. 13.

One Specimen.

CLEMENTIA TAENIOSA Guppy. Proc U.S. National Museum
1896 P. 327, Pl. xxx, Fig 8.

From the Montserrat Beds. One Specimen.

CYTHEREA PLANIVIETA Guppy. Journ. Geol. Soc. 1866
Page 292 Pl. xviii Fig. 3

This species is abundant and finely developed at Springvale, hence we give a figure of it (Pl. 2. Fig. 2). The concentric plication is very variable and some specimens are quite smooth. Its kinship to *C. erycinoides* and *C. striatela* of the European Tertiaries, also to the recent *C. erycina*, was noted in the original description, and it may further be remarked that it is a member of the same group as the well-known *C. chione* of European seas.

ARCA TAENIATA Dal. Flor. Foss. Part iii Page 631 Pl. xxv, Fig. 1.

There is only a fragment in the collection attached to a cast. It belongs to the Section *Barbatia* and is near to *A. obliquata* Wood of the Indian Ocean.

ANCILARIA LAMELATA Guppy. *A. shepardi* Dall Flor. Foss.
Part i Page 46 Pl. iv, F. 4.

MODULUS TURBINATUS Heilpr. Dall Flor. Foss. Part ii
Pl. xviii, F. 12.

A Fragment.

TURITELA APICALIS Heilpr. Dall Flor. Foss. Part i, P. 316
Pl. xvi, F. 10—13

TURBINELUS SCOLYMOIDES Dal.

Flor. Foss. Part i Pl. iii, F. 2, 5.

A Fragment.

PECTEN LYONII Gab.

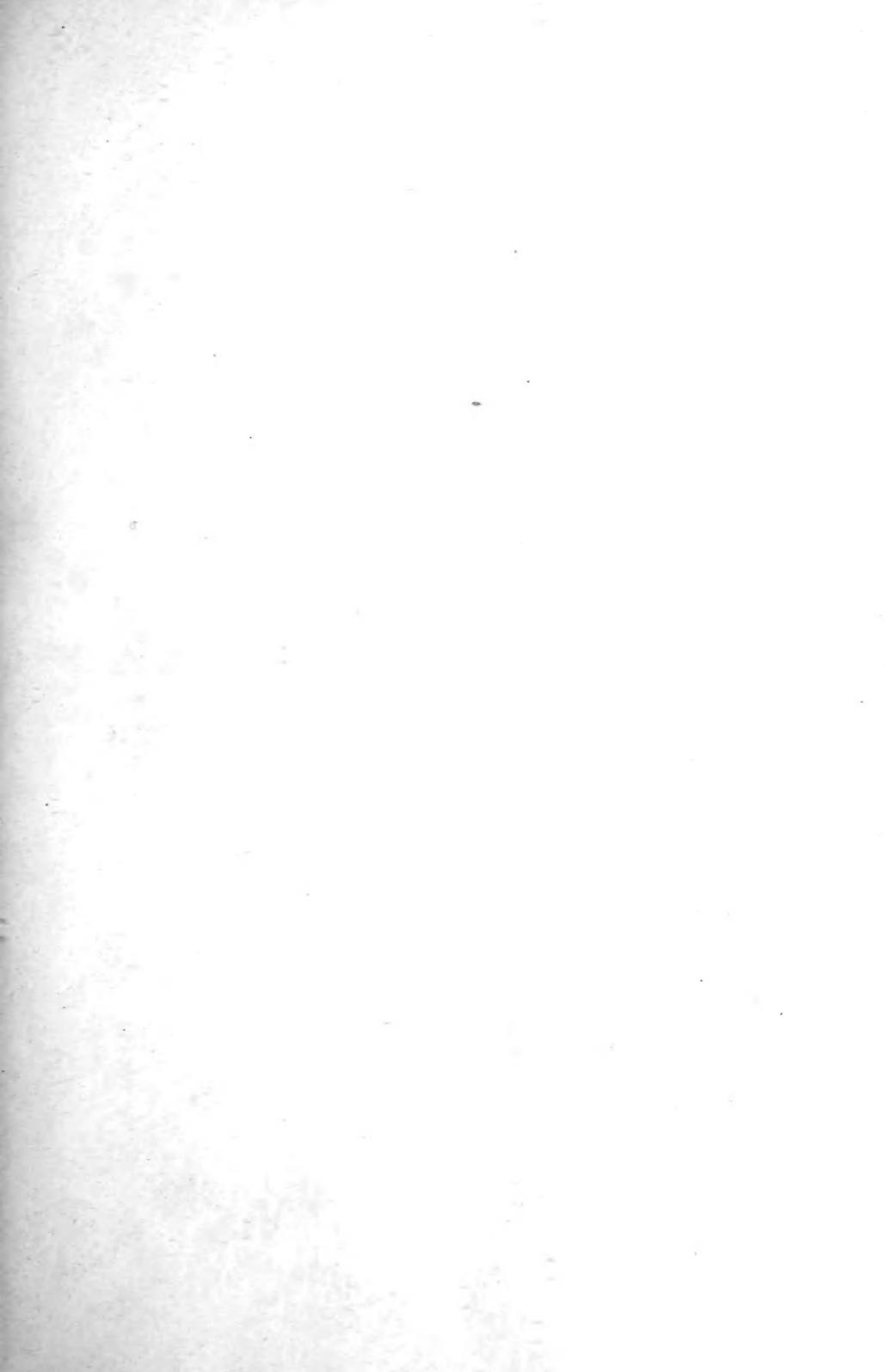
Gabb, Caribbean Fossils, Journ. Acad. N.S. Phil. 1881 (vol. viii) P. 347, Pl. xlv, F. 25. Near to *P. japonica* and *P. pleuronectes*. A specimen is near six inches (140mm.) in diameter. It goes to pieces on a touch. It is found in the Miocene of Anguila and Jamaica, also Central America. Gabb's *P. papyracea* from Haiti is probably a young specimen.

PECTEN SOROR Gab.

Geology of San Domingo Page 257.

Dall, Flor. Foss. Part iii Page 712.

The convex valve has twenty ribs, but the flat one has only about a dozen. Only two or three disunited valves have occurred.







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