ART. XXXVII.—*Synopsis of the Collections of Invertebrate fossils made by the Princeton Expedition to Southern Patagonia;* by Dr. A. E. ORTMANN.

IN the February number (1900) of this Journal, Mr. J. B. Hatcher has given a general account of the sedimentary rocks of Southern Patagonia, frequently (pp. 98, 101–104, 108) referring to the present writer's studies on the fossils of this region. Since these studies have now come to an end, it seems well to give a preliminary report on the chief results obtained, in order to give an idea of the richness of the material at hand, and to enable the scientific public to get a more correct understanding of the beds in question than has hitherto been possible. A final report on the Tertiary Paleontology of Southern Patagonia will be given by the writer in a volume of the "Princeton Expedition to Patagonia," which is in course of preparation, and will be freely illustrated by figures of all species represented, drawn by Mr. F. van Iterson. It is hoped that this volume will be ready by the end of this year or the beginning of next.

The present article is intended to treat only of the so-called "Patagonian formation." As Mr. Hatcher has already pointed out (l. c., p. 101), we have sufficient reason to believe, that the different marine horizons distinguished by F. Ameghino and accepted—at least in part—by H. von Ihering (the Patagonian formation, divided into a "Piso Juliense" and "Piso Leonense," and Suprapatagonian beds or lower part of the Santa-Cruz-formation) are identical, i. e., belong in one and the same continuous series of marine deposits underlying the Mammiferous Santa-Cruz-formation, and we retain the old term *Patagonian formation* for this series, which is certainly a paleontological unit, and belongs, as the writer is now fully satisfied, in the *Lower Miocene.* The fauna of this series is represented in our collection by over 140 species, many of which are new to science.

I shall give here first a list of the *new species*, with short diagnoses and other remarks that are necessary to recognize them, and then I shall add a list of species known from other localities, but *not found previously in Patagonia*, and shall conclude this article by some remarks on the *synonymy*, etc., of known Patagonian forms.

Diagnoses of new species from the Patagonian formation.

ECHINODERMATA.

1. *Cidaris antarctica* sp. nov. Plates with a moderately large, perforated central tubercle, the neck of which is slightly crenulated. Scrobicule large, surrounded by a circle of small tubercles, between which there are still smaller ones. Spines subcylindrical, often slightly compressed, neck somewhat constricted. Articular surface finely striated, with a deep articular groove. Surface of spines closely covered with fine, rounded granules, forming irregular longitudinal rows.

Only isolated spines and plates, San Julian, Santa Cruz, Upper Rio Chalia, Lake Pueyrredon.

2. *Toxopneustes præcursor* sp. nov. Test suborbicular. Ambulacral and interambulacral spaces with 4–8 vertical rows of tubercles of subequal size, those of the ambulacral spaces being somewhat smaller. Poriferous zone moderately broad. Pores in three pairs, the two outer vertical rows separated from the inner row by a small tubercle. All the primary tubercles surrounded by small secondaries and miliaries. Actinostome sunken, and lower surface concave, the actinal cuts comparatively slight.

This species differs from the known recent species of *Toxopneustes* chiefly in the more crowded tubercles. The most closely allied form seems to be: *T. pileolus* (Lmck.).

San Julian; Shell Gap (Upper Rio Chico).

3. *Cyrtoma posthumum* sp. nov. Test subcircular-elliptic, depressed. Apex central, upper side covered with very fine tubercles. Ambulacra petaloid, open, lanceolate, subequal, extending about two-thirds from the apex toward the periphery, the posterior ones closer together than the others. Anus situated on the upper surface, in a deep depression, of a pyriform shape, narrow above and suddenly widening toward the periphery. Lower surface of test concave, covered with larger, more widely separated tubercles. Mouth subcentral, surrounded by a floscelle. Diameter ca. 110^{mm}, height ca. 28^{mm}.

The peculiar shape of the anal depression brings this species into the genus *Cyrtoma* of McClelland (Calcutta Journ. Nat. Hist., 1840), a synonym of which is *Stigmatopygus* of d'Orbigny. It is the first Tertiary representative of this so far exclusively Cretaceous genus.

Lake Pueyrredon.

VERMES.

4. *Serpula patagonica* sp. nov. Tubes solid, calcareous, cylindrical, irregularly contorted and vermiculate, growing

upon shells, stones, etc. Outer surface transversely rugose. Diameter, 3^{mm}.

San Julian.

5. *Terebella magna* sp. nov. Large cylindrical tubes, isolated or growing in groups of two or three, straight or slightly curved. Walls composed of large and irregular fragments of shells. Inner surface of tubes smooth, outer surface very rough. Diameter of inner tube, $12–15^{mm}$.

Systematic position of these tubes, apparently built by a worm, doubtful.

San Julian.

BRYOZOA.

6. *Melicerita triforis* sp. nov. Zoarium foliaceous, lobate. Zooecia hexagonal, disposed quincuncially on both surfaces of the zoarium. Orifice crescentic, large, about in the middle of each cell. Besides there is an ovarian opening on the summit of the cell, and two (? avicularian) openings on the side of the mouth.

The three openings in the upper part of the cell distinguish this species from all the rest.

Upper Rio Chalia.

7. *Reticulipora patagonica* sp. nov. Closely resembling *R. transennata* Waters (Quart. Journ. Geol. Soc., vol. xl, 1884, p. 689), and differing only, if at all, in the branches of the zoarium being a little stronger, and the zooecial openings being more crowded.

Santa Cruz.

8. *Tennysonia subcylindrica* sp. nov. Closely resembling the only known species of the genus, *T. stellata* Busk (Cat. Mar. Pol. Brit. Mus., 3, 1875, p. 34), but differing by the more slender branches of the Zoarium, which are subcylindrical, and the slightly prominent orifices of the cells.

Santa Cruz.

PELECYPODA.

9. *Modiola andina* sp. nov. Shell small, elongated. Apex near anterior end. Both valves convex, with a blunt ridge running down from the apex to the posterior and inferior end. This ridge is slightly curved, concave toward the lower margin. Upper margin almost straight in its anterior part, forming a blunt angle with the straight posterior part, which passes in a regular curve into the posterior margin. Ventral margin concave. Surface of shell in the upper half (above the oblique ridge) finely radially striated. Lower part of surface smooth, only near the anterior end, below the apex, with a few fine striæ. Length of shell, 24^{mm}; height, 9^{mm}.

Lake Pueyrredon.

10. *Nucula reticularis* sp. nov. Shell small, moderately convex and moderately thick, subovate, oblique. Posterior and anterior dorsal margin slightly convex, ventral margin strongly arcuate. Surface with very fine concentric ribs, which are irregular and often bifurcate. These ribs are crossed by still finer radial striæ, which give a beautifully reticulated appearance to the shell. Ventral margin finely crenulated on inner side. Hinge teeth fine, both parts of the series forming an obtuse angle, anterior part with ca. 9, posterior with ca. 18 teeth. Length, $7{\cdot}5^{mm}$; height, 6^{mm}.

The sculpture of this species is of the type of that of the Oligocene *N. chasteli* Nyst.

Santa Cruz and Mt. of Observation.

11. *Crassatella quartá* sp. nov. Shell elongated-ovate, comparatively thin, not very convex. Apex only slightly prominent. Anterior end rounded, posterior hardly angulated and hardly narrowed. Posterior dorsal margin straight near apex, anterior almost straight, with only a slight suggestion of concavity close to the apex. Surface ornaments as in *C. Lyelli* Sowerby, but the ridges more crowded and a little less developed. Ventral margins without crenulations. Length, 17^{mm}; height, 10^{mm}, but growing larger.

Santa Cruz; Lake Pueyrredon.

12. *Glycimeris regularis* sp. nov. Shell elongate, convex, with concentric lines of growth and undulations. Apex at $\frac{1}{3}$ of the length, incurved. Anterior end rounded, posterior subtruncated, not narrower than anterior. Ventral margin straight in the middle. Long., 78; height, 45.

This form does not agree with any of the described Patagonian species, and accordingly I think it is new, although all the distinctive characters are taken only from the external form.

Santa Cruz; San Julian; Lake Pueyrredon.

13. *Corbula hatcheri* sp. nov. Shell small, solid and thick, subovate-triangular. Right valve very little larger than the left, both moderately convex. Anterior end rounded, posterior produced, subtruncated, an angular ridge running from apex to posterior angle. Ventral margin arcuate, posteriorly a little concave. Lower margin of right valve reflected toward the left valve. Surface with concentric ribs, which are rounded and rather crowded. Length, 11; height, 7·5; diameter (of right valve), $2{\cdot}5^{mm}$.

Santa Cruz; Las Salinas; Mt. of Observation; San Julian.

14. *Martesia pumila* sp. nov. This species resembles much *M. patagonica* Phil. but is much smaller, the callous plate of the anterior margin is very small, and the ribs of the anterior part of the shell form a very obtuse angle with the lines of

growth of the posterior part. The radiating furrow is narrower, and is more inclined posteriorly, so as to render the posterior part of the shell smaller in comparison with the anterior. Length, 9^{mm}; height, 4^{mm}.

This does not seem to be an immature stage of *M. patagonica.*

Santa Cruz.

GASTROPODA.

15. *Liotia scotti* sp. nov. Shell small, rounded, flat above, with a large, open umbilicus below. Spire with four rounded whorls, increasing rapidly, suture deep. Last whorl with six revolving, equidistant keels, the keel nearest to the umbilicus the smallest, and disappearing within the umbilicus; the upper whorls show only the two uppermost keels. The keels are crossed by very fine striæ, and a number (15) of strong radial ribs; at the points of intersection of these ribs and the keels, there is a small conical tubercle. Last whorl a little deflected toward the mouth, which is circular and thickened. Height, 4^{mm}; diameter, 8^{mm}.

This species resembles much the recent *L. acrilla* of Dall.

Santa Cruz.

16. *Calliostoma observationis* sp. nov. Shell low, conical, not umbilicated. Whorls flat, last whorl on the periphery bluntly angular. Above this angulation there are five distinct revolving ribs; near the mouth, between the second and third (counted from above), a sixth rib begins to appear. In the upper whorls the second and fourth ribs disappear, so that only three ribs remain, besides the peripheral angulation, which shows as a fourth rib immediately above the suture. All these ribs, when fully developed, are subequal, flattened, smooth, about as broad as the intervals between them. The base of the shell has 9–10 revolving ribs of the same character. The outermost of them is not separated from the peripheral angulation by a broader interval. Height, $10{\cdot}5^{mm}$; diameter, 12^{mm}.

Mt. of Obser ation.

17. *Calliostoma cossmanni* sp. nov. Shell conical, higher than broad, not umbilicated. Whorls flat, the last one angulated, with a keel on the periphery, which is wholly exposed on the upper whorls, being situated close to, but above the suture. Upper whorls with five revolving keels, the lowermost, formed by the peripheral keel just mentioned, is the strongest. It is smooth, with hardly any trace of granulations. The uppermost and the third keel are stronger than the second and the fourth; the first, second, and third are distinctly granulated, the fourth with finer granulations. Toward the apex of the shell, the second and fourth keels disappear, so that only three keels are present, the two upper

ones granulated, the lower one smooth. Base of shell hardly convex, with six revolving keels, which are subequal, smooth, and narrower than the intervals. Height, 8^{mm}; diameter, $6{\cdot}5^{mm}$.

Santa Cruz.

18. *Calliostoma garretti* sp. nov. Shell conical, as high as broad, not umbilicated. Eight whorls, which are very slightly convex, suture shallow. Last whorl very bluntly angulated at the periphery, without a distinct keel. Surface of whorls, above the periphery, covered with numerous fine, revolving threads: there are, on the third whorl, about 7 of them, increasing to about 17 on the last. The number of the threads increases by intercalation, the new keels being at first smooth, but soon they equal the others, and become, like the latter, finely, but distinctly granulated. These granulations, however, are developed only in the upper three quarters of the whorl, the lower four or five threads remain smooth. The threads continue over the periphery to the base of the shell, which is slightly convex; their number, on the base, is about 24, and they are smooth, resembling in all other respects those of the upper part of the whorls. Height and diameter 17^{mm}.

Santa Cruz.

19. *Calliostoma iheringi* sp. nov. Shell conical, broader than high, umbilicated. Six whorls, which are sharply angulated, one angulation being formed by a sharp revolving keel in the upper part of the whorls, a second one—exposed only on the last whorl—formed by a peripheral keel. Suture distinct. Upper part of whorls (above upper keel) oblique, flat, with 5–6 revolving threads, which are slightly granulated; lower part vertical, slightly concave on the last whorl, with 6–7 fine, smooth threads. Base of shell slightly convex, depressed toward the umbilicus, which is moderately large. About 18 revolving threads on the base, which are smooth, more crowded and finer toward the periphery, a little stronger near the umbilicus. Height, $9{\cdot}5^{mm}$; diameter, 12^{mm}.

Santa Cruz.

20. *Crucibulum dubium* spec. nov. Cast suborbicular, depressed-conical. Apex central. On one side is the impression of the internal cup-shaped lamina, which was attached to the inner wall of the shell. No further characteristics can be given, since only a single cast is represented in our collection.

Arroyo Gio.

21. *Sigapatella americana* sp. nov. Shell suborbicular or subelliptic, depressed. Apex distinctly excentric. Surface with irregular, concentric, slightly lamellate striæ, crossed by very fine radial rugosities. Internal diaphragma spiral, colu-

mella excentric, margin of diaphragma slightly concave and slightly reflexed at the columella. Height, 16^{mm}; diameter, 49^{mm}.

Santa Cruz; Punta Arenas.

22. *Dolium ovulum* sp. nov. Shell ovato-globular, spire short, conical, acute, last whorl large. Surface with fine and crowded revolving striæ, which are sub-equal, only in the lower part finer ones are intercalated. Mouth large, elongated-oval, canal very short, truncated, straight and comparatively narrow. Inner lip without callous tubercles or folds. Outer lip slightly thickened. Height, 34^{mm}; diameter, 25^{mm}.

Santa Cruz.

23. *Tritonium morgani* sp. nov. Shell subfusiform, elongated, with three varices. Whorls with fine, unequal, spiral striæ and large tubercles, the latter, on the last whorl, in three spiral rows, those of the upper row large, ca. seven between two varices; those of the middle row (5-6) small, and those of the lower row (3–4) very indistinct. Columella smooth, with a few indistinct crenulations in the lower part. Canal comparatively long. Outer lip distinctly crenulated, with an indistinct canaliform emargination in the upper part, opposite which is a fold on the inner lip. Height, 63^{mm}; diameter, 28^{mm}.

Santa Cruz.

24. *Buccinum annæ* sp. nov. Shell subfusiform, elongate-oval. Spire long. Whorls 7–8, angulated, the angulation with a series of tubercles, 12–14 of them on the last whorl, which are continued downward as irregular longitudinal ribs. Upper part of whorls slightly concave, appressed toward the suture. Exposed part of upper whorls, below angulation, subcylindrical. Last whorl large. Mouth ovate, elongated, upper end subcanaliculate, lower end truncated, and with a short reflexed canal, forming a varix on the columella. Outer lip thin, smooth within. Height, 66^{mm}; diameter, 30^{mm}. This species belongs into the subgenus *Cominella.*

Santa Cruz.

25. *Fusus archimedis* sp. nov. Shell fusiform, spire shorter than the last whorl, scalariform. Whorls very prominently angulated, suture very deep. Upper part of whorls, above angulation, flat, obliquely descending from the suture, lower part, below angulation, very slightly convex, obliquely receding downward to the suture. Angulation blunt, with a number (10–13) of blunt, often indistinct tubercles. Surface of shell with fine revolving ribs on the lower part of the whorls and upon the angulation, but these ribs are absent on the upper part, above the angulation. Whole surface with distinct lines of growth, which have a squamiform appearance, where they

cross the revolving ribs. Last whorl large. Mouth triangular, continued into a long and straight canal. Height, 50^{mm}, but defective on upper end; diameter, 25^{mm}.

San Julian.

26. *Fusus torosus* sp. nov. Shell subturbinate or subfusiform. Spire short, rather depressed. Whorls four, last one very large. Surface with numerous fine spiral ribs, which are rather crowded and somewhat unequal, crossed by very fine, squamiform lines of growth. Whorls strongly convex, swollen, with ca. seven strong, variciform longitudinal ribs, which begin at the suture and become thick and swollen in the middle of the last whorl, attenuating again toward the lower end of the shell. Mouth ovate, continued into a canal of moderate length, which is slightly curved. Height, 31; diameter, 20^{mm}. This species resembles somewhat *F. pyruliformis* Sow., from Navidad, and I would not hesitate to identify it with this species. But Sowerby's figure seems to be poor, and the account given by Philippi and Moericke of *F. pyruliformis* shows clearly that it is different.

Santa Cruz.

27. *Fusus cancellatus* sp. nov. Shell small, fusiform, elongated. Spire a little shorter than the last whorl. Whorls convex, surface ornamented by revolving and longitudinal ribs, cancellated. Spiral ribs, in the upper whorls, 4–5, 12–18 on the last whorl; they are sharp, but flat, equidistant, narrower in the intervening spaces between the longitudinal ribs, and on the points of intersection with them slightly broadened, giving the appearance of low tubercles. Longitudinal ribs 12–13 on one whorl, rounded, but distinct, running from suture to suture, but disappearing on the canal. Mouth elliptical, canal comparatively short. Outer lip crenulated within. Height, 16^{mm}; diameter, 6·5^{mm}.

Santa Cruz.

28. *Fusus pilsbryi* sp. nov. Shell thick, elongated, fusiform; spire a little shorter than the last whorl. Whorls 7–8, convex, slightly appressed in the upper part, ornamented with 8–9 strong, rounded longitudinal ribs, which are slightly oblique and curved. On the upper whorls these ribs reach from suture to suture, on the last whorl they disappear below the middle. All of the surface of the shell is covered by very fine, numerous, distinct and subequal spiral striae. Mouth comparatively small, continued into a short canal. Outer lip thick. Height, 36·5^{mm} (not quite complete); diameter, 12^{mm}.

Santa Cruz.

29. *Murex hatcheri* sp. nov. Shell ovato-subfusiform. Whorls 5–6, rapidly increasing. Spire short, conical. Upper whorls angulated by a prominent, but blunt carina, which is

situated below the middle of the whorls; this carina forms an angulation on the last whorl, and below it there are 4–5 other carinae, decreasing in size. Upper part of whorls flat and obliquely descending from the suture, with a few revolving striae. Varices 5–6, lamelliform, strong and thick, at the points of crossing with the spinal carina produced into short leaf- or ear-like lobes, strongest on the uppermost carina. On the upper whorls only the uppermost row of lobes is visible. Mouth large, oval, with an open canal of medium length. Outer lip ornamented with 5–6 lobes, corresponding to those of the varices. Height, 63^{mm}; diameter, 44^{mm}.

San Julian.

30. *Urosalpinx elegans* sp. nov. Shell ovato-fusiform; whorls 5–6, convex, with spiral striae and 7–8 longitudinal, variciform costae, which are rounded. Mouth oval, elongated into an open, but narrow canal, which is about as long as the mouth. Outer lip distinctly crenulated within. Height, $16{\cdot}5^{mm}$; diameter, 8^{mm}.

Santa Cruz.

31. *Marginella oliviformis* sp. nov. Shell elongated, subcylindrically-fusiform. Spire conical. Surface of shell smooth and shining. Suture quite indistinct. Mouth long and narrow, canal very short, represented only by a rounded sinus. Columella with four subequal folds. Outer lip thickened, smooth within. Height, 11^{mm}; diameter, 5^{mm}; length of mouth, $6{\cdot}5^{mm}$.

Santa Cruz.

32. *Voluta petersoni* sp. nov. Shell elongated, fusiform. Surface beautifully cancellated by spiral and longitudinal ribs. Spiral ribs strongly developed, equidistant, sharp; longitudinal ribs a little stronger than the spiral ribs, sharp, running from suture to suture, ca. 30 on the last whorl. Cancellations rectangular, about twice as broad as high on the last whorl, and about three or four times as broad on the upper whorls. Spire slender, conical, mouth not much longer than half of the shell. Upper whorls quite high. Whorls almost evenly convex, only slightly appressed and concave near the suture. Mouth elongated. Columellar folds at least two, indistinct. Height, 148^{mm} (not complete); diameter, 65^{mm}.

Santa Cruz.

33. *Drillia santacruzensis* sp. nov. Shell turrite, subfusiform. Whorls 8, last whorl hardly half as long as the shell. Whorls convex, but depressed and slightly concave in the upper part near the suture. This depression forms a shallow furrow, following the suture, and is sharply separated from the rest of the whorl, which is ornamented by oblique longitudinal ribs, which end abruptly at the sutural depression. These ribs number 12–15 in one whorl. Besides, there are

very fine lines of growth, but no trace of spiral sculpture. Mouth elongated, canal short. Sinus of outer lip semicircular, situated in the sutural depression, close to the suture; at the point of junction of the outer lip with the columella there is a distinct nodulose, callous swelling. Height, 13^{mm}; diameter, $4{\cdot}5^{mm}$.

Santa Cruz

34. *Borsonia patagonica* sp. nov. Shell subfusiform, biconical; whorls ca. 6, last whorl a little larger than half of the shell. Whorls convex, depressed in the upper part, with a slight swelling just below the suture. Depressed part smooth, the rest ornamented by 10–12 longitudinal rib-like swellings, which are slightly tuberculiform on the upper whorls; on the last whorl they are rib-like, but less distinct. Besides the ribs, there are spiral cords on the lower part of the whorls; they are wanting on the depressed part, but continue, on the last whorl, upon the canal. Mouth elongated, canal of medium length. Outer lip with a moderately developed sinus, which is situated in the sutural depression. Columella with two plaits, the lower one sometimes quite indistinct. Height, 19^{mm} (not complete); diameter, 9^{mm}.

Santa Cruz.

35. *Actæon semilævis* sp. nov. Shell elongated-ovate, rather slender, spire short, conical, about one-quarter of the length of the shell. Whorls four, convex. Suture distinct, a slight carina running close to the suture and parallel to it. Below this carina there is an indistinct spiral groove. Below the latter the surface of the shell is smooth; but in the lower third of the last whorl there are 5–7 spiral furrows, which are rather broad, almost as broad as the flat intervals. Mouth elongated, wider below, columella with a distinct fold below. Height, 7^{mm}; diameter, $3{\cdot}5^{mm}$.

Mt. of Observation.

CRUSTACEA.

36. *Scalpellum juliense* sp. nov. Only the carina known. Carina narrow, elongated, strong and solid, curved; basal margin bluntly pointed; surface smooth, only with lines of growth. Tectum strongly arched in its upper part, only slightly so in its lower; upper part solid, its cross section almost quadrangular, with a prominent ridge on the concave side, formed by the junction of the inflected parietes. Parietes very narrow, separated from the tectum by a distinct but blunt ridge. The carina of *S. solidulum* Steenstr. (See Darwin, Monogr. foss. Lepad., 1851, p. 42, pl. 1, f. 8) resembles so much the present fossil, that I have no doubt, we have to deal here with a closely allied species.

San Julian.

Species new for the Patagonian formation.

BRYOZOA.

1. *Cellaria fistulosa* (L.). (Hincks, Hist. Brit. mar. Polyzoa, 1880, p. 106.) This species is a living, almost cosmopolitan form, and has been found fossil from the Oligocene beds upward in Europe and New Zealand.

Shell Gap (Rio Chico).

2. *Aspidostoma giganteum* (Busk). (Busk, Rep. Challenger, vol. x, 1884, p. 161.) Known so far only living from southern Patagonia.

Santa Cruz and San Julian.

3. *Heteropora pelliculata* Waters (see Nicholson, Ann. Nat. Hist., ser. 5, v. vi, 1880). Known living from Japan and New Zealand, and fossil from New Zealand.

San Julian; Arroyo Gio.

BRACHIOPODA.

4. *Rhynchonella squamosa* Hutton (Cat. Tert. Moll. New Zealand, 1873). Fossil from New Zealand and Australia, living (*pixydata* Dav.) from Kerguelen Islands.

Lake Pueyrredon.

5. *Terebratella dorsata* (Gmel.). (Davidson, Trans Linn. Soc., 1887, p. 75.) Fossil in New Zealand, and living on the Patagonian coast.

Santa Cruz; Shell Gap; Lake Pueyrredon.

PELECYPODA.

6. *Mytilus magellanicus* Chem. (Reeve, Conch. Icon., vol. x, 1858.) Living on the Patagonian coast.

San Julian.

7. *Leda oxyrrhyncha* (Philippi), (Tert. und Quart. Verst. Chiles, 1887, p. 197). Navidad beds of Chile.

Santa Cruz and Arroyo Gio.

8. *Leda errazurizi* (Philippi), (Ibid. p. 196). Navidad beds of Chile.

Santa Cruz; Sierra Oveja (Rio Chico); Arroyo Gio; Lake Pueyrredon.

9. *Cardita elegantoides* Ortm. (Amer. Journ. Sci., 1899, p. 428), described from the Magellanian beds of Punta Arenas.

Santa Cruz and Mt. of Observation.

10. *Cardita volckmanni* Phil. (l. c., p. 173). Navidad beds of Chile.

Lake Pueyrredon.

11. *Venus chiloënsis* Phil. (l. c., p. 121). Chile.

Punta Arenas. (Known previously from this locality, but stratigraphical position not ascertained.)

Gastropoda.

12. *Vermetus cf. intortus* (Lmck.). (Moerch, Proc. Zool. Soc. London, 1861.) Known from Oligocene to Pliocene deposits in Europe. The identification is not beyond doubt.
Shell Gap; Lake Pueyrredon.

13. *Galerus araucanus* (Phil.), (l. c., p. 92). Navidad beds of Chile.
Shell Gap; Lake Pueyrredon.

14. *Aporhais araucana* (Phil.), (l. c., p. 35). Navidad beds of Chile.
Santa Cruz.

15. *Buccinum obesum* (Phil.), (l. c., p. 48). Navidad beds of Chile.
Santa Cruz.

16. *Cancellaria cf. medinae* (Phil.), (l. c., p. 68). Navidad beds of Chile. Identification not quite certain.
Santa Cruz and Mt. of Observation.

Crustacea.

17. *Verruca laevigatæ* Sow. (Darwin, Monogr. Balan., 1854, p. 520). Living on the coast of S. America.
Upper Rio Chalia.

Remarks on Synonymy, etc.

1. *Magellania lenticularis* (Desh.). What v. Ihering mentions as *M. globosa* I take for *M. lenticularis.*

2. *Ostrea ingens* Zitt. The large Patagonian oyster is absolutely identical with the New Zealandian species described by Zittel as *O. ingens*, and differs from *O. patagonica* of d'Orbigny. The latter is not found at all in the Patagonian formation. There is only one species in the Patagonian beds.

3. *Pecten proximus* v. Ihering. This species has been called by v. Ihering in his text (Rev. Mus. S. Paulo, 1897, p. 229) by the name of *P. centralis* Sow., but is different; I accept for it the name given by v. Ihering on the plate.

4. *Pecten geminatus* Sow. Synonyms of this species are: *P. quemadensis* v. Ih. and *P. fissicostalis* v. Ih.

5. *Cucullæa alta* Sow. I cannot distinguish v. Ihering's *C. dalli* from this species.

6. *Cucullæa darwini* (Phil.). There is not the slightest doubt, that *Cucullaria tridentata* of v. Ihering is this species.

7. *Pectunculus ibari* (Phil.). Synonyms of this species are: *P. magellanicus* Phil. and *P. pulvinatus cuevensis* v. Ih.

8. *Nucula patagonica* (Phil.). *N. tricesima* v. Ih. is only a variety of this species.

9. *Cardita inæqualis* Phil. This species is the most abundant form of the genus at Santa Cruz. Large specimens of it have been sent by v. Ihering to the Princeton Museum under the name of *C. patagonica* Sow., and thus it seems apparent that *C. patagonica* of v. Ihering is identical with *C. inæqualis* of Philippi.

10. *Cardita patagonica* Sow. We possess only the small variety, called by v. Ihering in 1899 (Neues Jahrb. Miner., etc.) *C. pseudopatagonica.* I believe that this is really the true *patagonica* of Sowerby.

11. *Venus navidadis* Phil. Already v. Ihering suggests that his *V. striatolamellata* may be identical with this species. I think that is right.

12. *Dentalium sulcosum* Sow. Synonyms of this species are: *D. majus* Sow., and *D. patagonicum* Rochebrune and Mabille.

13. *Gibbula dalli* v. Iher. *G. fracta* v. Ih. seems to be nothing else than the young of this species.

14. *Infundibulum clypeolum* (Reeve). Called by v. Ihering *Trochita magellanica* Gray. But the specific name of Reeve has the priority.

15. *Natica ovoidea* Phil. I take *N. famula* Phil. for the young stage of this species.

16. *Natica secunda* Rochebr. and Mab. The specific name *secunda* of Rochebrune and Mabille was published in 1885 (Bull. Soc. Philom. Paris, ser. 7, vol. ix) and has the priority over *N. obtecta* Philippi, 1887.

17. *Natica darwini* v. Ihering. According to v. Ihering the specific name of *N. solida* Sow. has been preoccupied by Blainville. He attributes the name *darwini* to Hutton, but I cannot find it in any of the publications of Hutton.

18. *Odontostomia suturalis* v. Ihering. *O. synarthrota* Cossmann (Journal de Conchyliology, 1899) is indistinguishable from this species.

19. *Turbonilla cuevensis* v. Iher. *T. iheringi* Cossmann (ibid.) is indistinguishable from this species.

20. *Struthiolaria chilensis* Phil. The extensive material at hand leaves it beyond doubt that *S. ameghinoi* v. Iher. is a synonym of this species.

21. *Fusus domeykoanus* Phil. *Siphonalia dilatata* var. *subrecta* of v. Ihering (1899) is this species.

22. *Trophon patagonicus* (Sow.). Abundant material of this species enables me to pronounce *T. laciniatus santacruzensis* v. Ihering as a form of this species, which is connected with it by numerous transitions.

23. *Urosalpinx cossmanni* nom. nov. For *U. cf. leucostomoides* Cossmann, non Sowerby.

24. *Voluta gracilior* v. Ihering. The specific name *gracilior* was introduced by v. Ihering in 1896 (Nachrichtsblatt Deutsch. Malakozool. Ges.) for *V. gracilis* Phil. (non Lea). It is impossible for me to distinguish from this species *V. quemadensis* v. Iher. The living *V. philippiana* Dall (1890) is different.

25. *Voluta domeykoana* Phil. *V. pilsbryi* v. Iher. (1899) does not seem to be different from this species.

26. *Pleurotoma subæqualis* Sow. What v. Ihering calls, in 1899, by the name of *Pl. discors* Sow. seems to belong to this species.

27. *Pleurotoma unifascialis* v. Ihering. This species has been regarded by v. Ihering (1897) as a variety of *P. discors*, but I think it is a good species.

28. *Geryon* (*?*) *peruvianus* (d'Orb.). *Cancer patagonicus* Philippi is apparently the same species as *Carcinus peruvianus* A. Milne Edwards (Ann. Sci. Nat., ser. 4, vol. xiv, 1860, p. 269). I do not think, however, that it is a *Carcinus*. It may belong to *Geryon*.

Princeton University, May, 1900.