longer than broad, 5th to 10th transverse, gradually increasing in width, the penultimate about twice as broad as long. Thorax broader than the head, as long as broad, the sides feebly rounded in front, straighter and a little retracted behind, rather more distinctly punctured than the head, the ground-sculpture similar. Elytra scarcely as long as the thorax and at the base slightly narrower, at the apex a little broader than the thorax and there broader than long, the puncturation very similar, finely coriaceous. Abdomen longer than the fore-parts, very finely, moderately closely punctured and with very fine more or less transverse striate ground-sculpture.

♂. 8th tergite with very small arcuate emargination in middle of posterior margin, externally with a very small and obscure denticle on each side.

Kings Domain, Westport, Westland. Type in Brookes Collection, co-type in mine.

LXVIII. *On some Fishes from the Eastern Mediterranean (Island of Rhodes).* By ENRICO TORTONESE, Zoological Museum, University of Turin (Italy).

I WAS in Rhodes in 1943 and, in spite of many difficulties, mainly due to war conditions, I was able to collect and study there a number of local fishes. They are interesting as no collection has been hitherto reported from this locality, and as the fauna of the Eastern Mediterranean is, as a whole ,much less known than that of the Western portion. Unfortunately all the material was lost and I saved only notes and drawings. A complete report will appear as soon as printing difficulties are over, but here are listed six species of outstanding importance, chiefly from a zoogeographical point of view.

✓ *Hemirhamphus marginatus* (Forsk.).

According to fishermen this fish appeared only recently at Rhodes; now it is often captured chiefly in summer and along the north-west coast (Trianda, Cremasto, etc.). Two Syrian species (*H. unifasciatus* Ranz. and *H. marginatus* Blkr.) are listed by Gruvel*. I will therefore

* [illegible] Faune Col. Franç[illegible], Paris, 1931,

point out that Bleeker's *H. marginatus* from the East Indies is not Forskål's *marginatus*, but a synonym of *H. fasciatus* Blkr.; Gruvel was mistaken in quoting author's name. As to *H. unifasciatus* it is quite probable it really belongs to *H. picarti* Cuv. & Val., a Mediterranean species present along the North African shores and referable to gen. *Hypoplectrodes* Gill. Steinitz * recorded *H. marginatus* as common at Haifa (Palestine); his description suggests it is the same species I found at Rhodes and whose habitat reaches, from Red Sea, Western Pacific and Natal. The largest specimens seen by me (190 mm. long, without beak and caudal fin) had the following characters.

Depth 7, head 4·75 in total length (measured as above), head length 0·75 in beak, eye 3·75 in head. Upper jaw rather wider than long. Scales large, 54 in longitudinal series. Dorsal rays 13, anal 11; the former fin originates in advance of the latter. Lower lobe of caudal a little longer than head. Colour (in formol): beak blackish, with white tip (probably red when alive), dorsal scales with brown border. A lateral well-marked bluish band, wider posteriorly. Caudal with grey border; dorsal and anal with grey anterior tip.

Lobotes surinamensis (Bloch).

In the Mediterranean this Percoid appears to have been recorded only at Palermo (Sicily), where Doderlein found and described † a single specimen. It is therefore of great interest to deal here with another one from Rhodes. Length 74 mm. Body rather compressed. Dorsal profile elevated, strongly concave on head. Maximum depth 2·2, head 3 in total length (without caudal), eye 4·75 in head, equal to snout. Caudal peduncle a little higher than long. Lower jaw projecting. Teeth rather strong, directed forward. Scales 46 on lateral line. All median fins basally scaled. Dorsal xii. 15, longest spines 2·5 in head; anal iii. 11. Pectorals nearly half long as head. In formol, brown with darker irregular blotches. Ventrals, dorsal and anal blackish; caudal with transverse brown band followed by very wide white border.

* Publ. Staz. Zool. Napoli, vol. viii. 1937, p. 326.

† Atti Sci. Lett. Art. Palermo, t. v. 1875, p. 1 (*L. auctorum*).

This young specimen suggests that *L. surinamensis* is not an occasional and very rare visitor in the Mediterranean, but a normal, even if not abundant, dweller of its warmest parts; there is little doubt that here reproduction occurs. Its Atlantic origin seems to be sure, but it is noteworthy that in the Eastern Atlantic this species was found in the Gulf of Guinea but not nearer to Gibraltar. I don't know records from the Red Sea, although *Lobotes* does exist in Indian Ocean. We cannot therefore admit its immigration via Suez canal, where this fish was said by Tillier * to be occasional and coming from the north. This gives further support for including the Mediterranean in its normal habitat, but it remains to be ascertained the distribution in this sea and the characters of this population that according to our present and fragmentary data seems to be isolated.

Scyris alexandrinus (Geoffr.).

Here is described one of five specimens taken in the harbour:

Total length (without caudal) 250 mm.; pectoral length 95; head length 70; caudal length 90; maximum depth 160; longest anterior anal rays 120; eye diameter 16.

Body very compressed, plain silvery. Anterior profile of head slightly concave. Caudal peduncle narrow, a little less than eye diameter. Lower jaw projecting. Posterior expanded end of maxillary 0·60 in eye. Teeth small, uniseriated on premaxillaries, in several series on anterior part of mandible, granular on vomer. Lateral line very arched in anterior half, straight posteriorly; on caudal peduncle it has a series of low scutes with slightly prominent keel. Dorsal vii–i. 20; soft rays 1–7 very long and black. Anal i. 8, with soft rays 1–3 filamentous. This fish is very rare at Rhodes, where fishermen don't know it. Its habitat are the warmer parts of the Mediterranean and West African coasts, from Morocco to Angola; it is recorded from Southern Spain, Malta and Syria. Palestinian species that Steinitz † doubtfully named *Caranx gallus* is surely *S. alexandrina*.

* Mém. Soc. Zool. France, t. xv. 1902, p. 318.

† Pubbl. Staz. Zool. Napoli, vol. viii. 1927, p. 344.

Gobius thori De Buen.

Near a little beach on the east coast of Rhodes I collected a small Goby that is the second specimen of this species hitherto studied. It was found under stones at low tide. *G. thori* was described * on a specimen (female ; 44 mm.) obtained by " Thor " in the Ægean Sea, south of Tenedo and considered by Fage † as *G. zebrus* Risso. De Buen supposed *G. thori* to be an eastern representative of the western *G. zebrus* and I can share his opinion : they are two closely related species, different for the arrangement of cutaneous papillæ on head. In *G. thori* these form on each side a series on throat and one on preopercular border : both series are lacking in *G. zebrus*.

My specimen, 22 mm. long, had a narrow interorbital as in the drawing of Fage and not a wide one as in *G. zebrus* figured by Ninni ‡ : maybe this is too a distinctive character. About 30 scales in longitudinal and 12 in transverse series. Ventral fins reaching anus. Colour brown with vertical and much darker bands, separated by whitish zones : these stripes were more marked in anterior half of the body and soon disappeared in formol. Head darker than body, with a transverse whitish band behind eyes ; similar but narrower bands on preopercle and from eye to posterior end of mouth ; some whitish spots scattered on cheeks. Pectoral base with a vertical light band followed by a darker one.

Remilegia australis (Benn.).

This is apparently the second specimen recorded from the Mediterranean.

Length 100 mm. ; depth 9·75, breadth among pectorals 5·5, head 9·75 ; eye diameter 7 in head, a little less than height of caudal peduncle. Lower jaw well projecting. Teeth villiform, external and lateral of upper jaw somewhat larger, those on vomer and palatine forming a continuous arch. Nine branchiostegal rays. Very small scales. Lateral line curved downward between pectoral end and border of cephalic disc. This is subelliptic, long 2·5 its breadth and about half the body ; has 26 pairs of lamellæ and a triangular smooth area at posterior

* Inst. Espan. Ocean. Notas y Res. ii. no. 22. 1928, p. 6, f. 3.
† Rep. Danish Oc. Exp. Med. ad. seas, ii. 1918, p. 83, f. 70.
‡ R. Com. Tal. Ital. Mem. ccxlii. 1938, tav. x, f. 6.

end. Dorsal (20 rays) and anal (21 rays) opposed and alike, half long as the disc and a little more than interval between this and dorsal origin. Pectoral, ventral and caudal equally long. Pectorals (22 rays) equalling snout, nearly half the head: their origin is opposed to the space between 17th and 18th pair of lamellæ and their end is under 24th pair, that is rather before end of disc. Ventrals (i. 4) originating under pectoral axil and very near each other. Caudal peduncle truncate. Brown, lighter on back; median fins blackish with a narrow white border.

Perugia * captured in the Adriatic Sea (Trieste) a Remora with large cephalic disc, uniform violet colour and characters just as above. He named it *Echeneis scutata* Gthr.; such term was then synonimized with *E. australis* Benn., placed by Gill (1864) in a separate genus (*Remilegia*). This species seems to be widely distributed, as Echeneidids in general, but rare. Trieste and Rhodes, the only Mediterranean localities where it has been found, are remarkably isolated as this fish is not recorded in Red Sea, nor in Eastern Atlantic.

✓ *Monacanthus setifer* Benn.

About twenty years ago it was noticed that this fish has immigrated from the Red Sea into the S.E. Mediterranean, but till now it was known only in Palestine. According to Steinitz † it is very rare at Haifa, on sandy bottom; Liebman ‡, too, says it is rather rare and approaches shore in winter. Its present discovery at Rhodes shows that it has further proceeded westward reaching at least the oriental boundary of the Ægean Sea. I had a single specimen (female), captured off Neocori (Rhodes) on muddy bottom (depth about 50 m.). Fishermen told me it is an extremely rare fish.

Length 110 mm.; depth 2, head 3, eye 4 in head; maximum depth under origin of second dorsal fin. Predorsal profile slightly concave. Skin with a mosaic of little irregular plates, bearing clusters of pointed and unequal spines. Six teeth on each jaw. Dorsal i. 25; spine inserted on posterior third of eye, as long as snout

* Elenco dei Pesci dell' Adriatico, Milano, 1881, p. 17, tav. iii.
† Publ. Staz. Zool. Napoli, vol. viii., 1927, p. 319.
‡ Comm. Int. Explor. Médit. Rapp. Proc. Verb. viii., 1934, p. 307.

and not reaching second dorsal when depressed backwards: it is curved only basally and has a rough anterior surface while posteriorly there are two series of thorns. None of dorsal rays prolonged; anal rays 29. Caudal with 12 principal rays, a little shorter than head and with convex posterior border. Pectorals 2·5 in head, with 13 rays. Ventral spine movable. Light brown, with small darker blotches and short longitudinal lines. Lips and teeth whitish. Iris brown with a bluish circle. Median fins light yellow brown, caudal darker in posterior third; pectorals nearly colourless.

LXIX. *Echinoderms from the Eastern Mediterranean (Island of Rhodes).* By Enrico Tortonese, Zoological Museum, University of Turin (Italy).

In 1943 I was able to investigate the littoral fauna along the Northern shore of the island of Rhodes, in the harbour of the town and in its neighbourhoods. There I obtained twenty species of Echinoderms, that are listed below: war difficulties prevented me from collecting more. Our knowledge of the Echinoderms of the Eastern Mediterranean is still extremely poor: concerning the Ægean Sea almost nothing has been added to the old Forbes' papers (1845–1849) and none of the Italian zoologists that visited Rhodes (Festa, 1912; Zoological Mission to Dodecanese, 1926) was interested in these animals and looked for them. All species are well known and require but few remarks. They are as follows:

Crinoidea.

1. *Antedon mediterranea* (Lam.).

Bottom with Zostera and Caulerpa at Cum Burnu; bottom with pebbles and coarse sand in front of Neocori. Very common and with striking colour variations (yellow, coral or orange red, chocolate brown, whitish with brown spots and rings on arms).

Asteroidea.

2. *Astropecten aurantiacus* (L.).

Sands with Zostera and Caulerpa near Cum Burnu; sandy and muddy bottom at the entrance of the harbour.

Quite common even at small depths (less than 10 m.), but I could not obtain large specimens (maximum diameter: about 30 cm.). Spines on supero-marginal plates were never acute, but always short and obtuse, sometimes scarcely prominent among low and flattened granules, so that general habitus was rather different from that of large and well aculeate specimens. This species shows therefore the same kind of variations well known in other *Astropecten*, although not so marked as in some of them.

3. *Astropecten bispinosus* (Otto).

Sandy bottom near Cum Burnu.

4. *Tethyaster subinermis* (Phil.).

Muddy bottom, 50–100 m. Rather abundant.

5. *Luidia ciliaris* (Phil.).

Sand and mud off Acandia Bay; depth about 20 m.

6. *Ceramaster placenta* (Müll. Trosch.).

Muddy bottom, 50–100 m. Very abundant and obtained by fishing boats chiefly in Trianda Bay (west coast). Perrier's description * of *Pentagonaster mirabilis* from Smyrna (Turkey) fits so well with specimens from Rhodes, that it seems quite certain that *P. mirabilis* is a mere synonym of *C. placenta*.

7. *Ophidiaster ophidianus* (Lam.).

One specimen was collected in the harbour among stones and sea-weeds; depth about 2 m. Bright red with large and irregular violet blotches on abactinal surface.

8. *Echinaster sepositus* (Retz.).

Stony bottom in the harbour and near Vodi Cape (East coast).

9. *Asterina gibbosa* (Penn.).

Under stones in very shallow water along the piers of the harbour, associated with Chitons and Terebellids in a rather peculiar biocœnosis. Very common, but mostly of small size. Two regularly tetramerous specimens were found on rocks in Mandracchio harbour. Colour always reddish with dorsal brown spots and yellow madreporic plate; other *Asterina* that I observed on the

* Arch. Zool. Exp. Gén. t. v. 1875, p. 40.

Anatolian shore were just alike. As in the Ligurian Sea (Italy) I only saw greenish grey specimens in the same ecological conditions, it is possible that this little Starfish shows local variations.

10. *Palmipes placenta* (Penn.).

Muddy bottom ; depth 30 m. and more.

11. *Coscinasterias tenuispina* (Lam.).

Of this species, that appeared to be rare, I had a single specimen (adult, eight-rayed, diameter 14 cm.) collected on stony bottom in the harbour.

OPHIUROIDEA.

12. *Ophiomyxa pentagona* (Lam.).

Muddy bottom ; depth about 50 m.

13. *Amphipholis squamata* (D. Ch.).

A single, large specimen was found in the harbour, under stones covered with sea-weeds.

14. *Ophiura texturata* (Lam.).

Muddy bottom ; depth about 50 m.

15. *Ophioderma longicauda* (Retz.).

Among stones and sea-weeds in the harbour ; not abundant.

ECHINOIDEA.

16. *Stylocidaris affinis* (Phil.).

I found a dead specimen in a trawl at Cum Burnu.

17. *Centrostephanus longispinus* Pet.

Common on sand and mud at a depth not less than 20 m.

18. *Paracentrotus lividus* (Lam.).

On stones and rocks with sea-weeds ; in rock pools in the harbour and near Acandia bay ; among Caulerpa and Zostera at Cum Burnu. Everywhere scarce. The colour of primary spines was variable, as usual, but nearly always was quite clear (green, more or less light, yellowish, sometimes reddish) : variability appeared therefore to be much more restricted than elsewhere, but on the Anatolian rocky shores, just in front of Rhodes, I saw a lot of dark coloured specimens, with violet-black or brown-black spines.

19. *Sphærechinus granularis* (Lam.).

On deep and rocky bottom near the harbour. According to local fishermen is a rather rare species.

20. *Echinocyamus pusillus* (O. F. Mull.).

I found but a single test among the spines of a large *Spondylus* shell.

Some zoogeographical notes must be added to this list. *T. subinermis*, *L. ciliaris* and *C. longispinus* appear to be here recorded for the first time in the Eastern Mediterranean. *A. aurantiacus* was not found in Lybia, nor in Egypt, but as it is known from Syria—and now from Rhodes—its presence along North African shores is to be expected; the same may be said for *E. sepositus* in Egypt, as I collected this species in Lybia and at Rhodes and Kolosvary * lists specimens from Cyprus. On the contrary, *Marthasterias glacialis* is perhaps really absent from the Eastern Mediterranean; I don't know it having been recorded there. It is possible that in this region this large Starfish lives only in deep water. Among Ægean Ophiurans quoted by Forbes † are *Ophiomyxa lubrica* (=*pentagona*), *Ophioderma lacertosa* (=*longicauda*) and *Amphiura neglecta* (=*squamata*). According to him the latter species is frequent; it seems therefore rather strange that I have found but a single specimen, even after careful researches. The same occurred to Mortensen ‡ in St. Elena, and I suppose that this tiny cosmopolitan Ophiuroid does not thrive equally well everywhere or that its abundance in a given place is subject to great annual fluctuations. *Arbacia lixula* (L.), observed by Issel at Cos §, is likely present at Rhodes too. It is noteworthy that such a keen investigator of shore fauna as Issel failed to find even a specimen of *P. lividus*. This species is really known in the whole Eastern Mediterranean; anyway at Rhodes it is scarce and only occasionally eaten. Maybe that also both these Echinoids show marked numerical variations, even temporarily changing certain biological facies. Lastly, it is to be pointed out

* Folia Zool. Hydrobiol. Riga, ix. no. 1, 1936, p. 77.
† Trans. Linn. Soc. London, xix. 1845, pp. 149–151.
‡ Vid. Medd. Dan. nat. Foren. Bd. xciii. 1932–33, p. 428.
§ Arch. Zool. Ital. xii. 4, 1928, pp. 259–271 (Rep. Zool. Miss. Dodec.).

the sure existence of Spatangoids near Rhodes; Issel observed their plutei and Forbes * recorded *Brissus* in Greek archipelago and Asia Minor. However missing in my collection, Holothurians too are present, as all fishermen asked by me knew them. The material here dealt with, although comprising but few species and coming only from north end of the island, is interesting because gives the first news on this Echinoderm fauna and improves our knowledge of general distribution of Mediterranean Echinoderms.

LXX.—*The Duration of Life in Terrestrial Isopoda.*

By Walter E. Collinge, D.Sc.

During the past few years results of many accurate observations have been published on the subject of the duration of life in the Terrestrial Isopoda. Hitherto the various statements on this subject have been, more or less, largely a matter of guesswork, rather than the results of experiments.

For many years past I have bred and reared numerous broods belonging to different species, and in quite a number of instances have kept specimens from their birth to their death. As I have elsewhere † pointed out during part of this period, my friend, the late Major Stanley S. Flower, unknown to me, had been carrying out similar experiments, and he, very magnanimously, placed the whole of his voluminous notes in my hands. Some of his results I have already published ‡, and I now wish to record others and some few later ones of my own and a list of the various species and their maximum ages.

Major Flower's experiments and observations were confined to three species, viz., *Oniscus asellus* Linn., *Porcellio scaber* Latr., and *Armadillidium vulgare* (Latr.); my own have embraced the following:—*Philoscia muscorum* (Scopoli), *Porcellio scaber* Latr., *P. dilatatus* Brandt, *Platyarthrus hoffmanneseggii* Brandt, and *Armadillidium vulgare* (Latr.).

* Proc. Linn. Soc. London, i. 1849, pp. 184-185.
† Nth. West. Nat., 1943, xviii. pp. 11, 12.
‡ *Ibid.*, 1944, xix. pp. 112, 113; 1945, [illegible] p. 5.