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SKELETAL VARIATION IN TWO LARGE CORALLA FROM TAHITI, ONE OF *PAVONA VARIANS* (VERRILL) AND ANOTHER OF *PSAMMOCORA HAIMIANA* MILNE EDWARDS AND HAIME

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[Plates 15 and 16]

The corallum of *Pavona varians* (Verrill)† (plate 15, figure 1, plate 16, figures 3, 4, 5, 9 and 10) is 23 cm. in length and 22 cm. in breadth, incrusting, rising into hillocks up to 3 cm. in height and 2·5 or 3 cm. in thickness over the greater part of the calicinal surface, hence corallum appears to be very irregular. On the hillocks valleys are sinuous, width about 3 mm., depth about the same. Colline is 1·5 mm. in thickness. The highest part of a hillock ends in a colline which then appears as a ridge. Septa are in two regular series, alternately broad and narrow, continuous over colline, hence forming an alternating series over the colline also. Inner margins of septa are almost entire, sides spinulose. Septa, after curving over colline, drop vertically down. Columellar centres are inconspicuous, appearing to be solid, ridged above; neighbouring centres are directly linked by 1 to 3 septal lamellae. When valleys are broader, more than one row of columellar centres are present along the base; centres tend to occur also on the sides of colline. This is the typical *P. varians* facies.

There are patches between hillocks where collines are absent, resulting in a reversal to the *P. cactus* facies. Intermediate stages between the *P. cactus* and *P. varians* facies are also noticeable.

On one side of the specimen are more or less fan-shaped horizontal foliae broadening from the proximal to the distal curved margin. Subsidiary calicinal areas are arranged in concentric rows on each folia, intersected by radial ridges of varying length, rarely continuous, from proximal to distal end of folia. This is the *Merulina ampliata* facies (Matthai 1923, plate II, figure 5). Between the concentric rows of calicinal areas are low concentric ridges. The intervals between radial ridges vary considerably in width, from the normal width of valley of 3 mm. up to 10 mm. Hence, the number of linear rows of calicinal areas varies, there being only a single linear row of calicinal areas in a valley of normal width. Radial ridges decrease in height, but hardly become so low as the concentric ridges. On hillocks, by the side of this region, collines become discontinuous.

In intervals between hillocks, valleys become shallow and collines often become discontinuous. The monticules that are formed by the breaking up of the collines vary in length. Hence the Hydnophoroid condition shows the *Hydnophora contignatio*, *H. exesa* and *H. microconos* facies; the monticules in the latter are conical, whilst in the two former they are elongated, being longer in the *H. contignatio* than in the *H. exesa* facies.

* The author died while the MS. of this paper was in the hands of the printer. The proofs have been seen through the press by R. B. Seymour Sewell, F.R.S.

† This specimen, belonging to the late Dr C. Crossland's collection, arrived without label, but is probably from Tahiti.

Thus, in this specimen, four facies are represented:

(1) The normal and typical *Pavona varians* facies, with sinuous collines and valleys, occurring on hillocks.

(2) The *Pavona cactus* facies on comparatively flat patches, characterized by absence of radial ridges.

(3) The *Merulina ampliata* facies, with diverging radial ridges, often discontinuous, on horizontal foliae.

(4) The Hydnophoroid facies, with monticules of varying length.

There is another large specimen from Tahiti, height 31 cm., length 26 cm., breadth 22 cm., showing the same range of variation, particularly (1), (2) and (3) above.

The corallum of *Psammocora haimiana* Milne Edwards and Haime (plate 15, figure 2; plate 16, figures 6, 7 and 8) is incrusting 31 cm. in length and 28 cm. in breadth. Although generically different, in regard to the structure of the corallum, this specimen agrees with that of *Pavona varians* (plate 15, figure 1) inasmuch as the corallum is irregular, with numerous hillocks, about 2 cm. in thickness, and exhibiting a similar range of variation. Hillocks are more or less vertical when they are low, but become oblique as they increase in height and tend to form a loose network, hence corallum appears to be very irregular (plate 15, figure 2). On small hillocks collines are continuous and valleys are sinuous as in *P. varians* with about the same width, 3 mm. (plate 16, figure 7), but their depth is less, about 2 mm., 8 to 12 septa occur around columellar centres, of which 1 or 2 are sometimes subsidiary and meet sides of principals. Septal margins are considerably sloping, irregularly dentate, the lowest teeth tending to rise up as paliform lobes. Sides of septa are spinulose. Columellar centres are well developed, dense, usually a point rising from each columellar centre. Spaces between septa are cut up by interseptal partitions which tend to form concentric rings around columellar centres.

Here and there are patches where radial ridges and collines are absent (plate 16, figure 6), the facies being then comparable to that of *P. cactus*.

The *Merulina ampliata* facies is seen in places towards the edge, although somewhat faintly, low radial ridges diverging towards the periphery (plate 15, figure 2).

On the taller hillocks and in the spaces between hillocks collines become discontinuous, resulting in monticules. The Hydnophoroid condition that is thus produced shows the *Hydnophora contignatio*, *H. exesa* and *H. microconos* facies, owing to variation in length of monticules, and is seen over the greater part of the specimen (plate 15, figure 2; plate 16, figure 8).

The four facies occurring in this specimen are, therefore, comparable to those seen in the corallum of *Pavona varians* described above, viz.

(1) *P. cactus* facies, without radial ridges or collines.

(2) The *P. varians* facies, with sinuous valleys, but not so well marked as in plate 15, figure 1.

(3) The *Merulina ampliata* facies, less developed than in plate 16, figure 10.

(4) The Hydnophoroid facies, with monticules of varying length, more extensive than in plate 16, figure 10 of *Pavona varians*; being the main facies in this specimen.

From the above account it will be seen that the specimen of *P. varians* and that of *Psammocora haimiana* are examples of wide range of variation along parallel lines.

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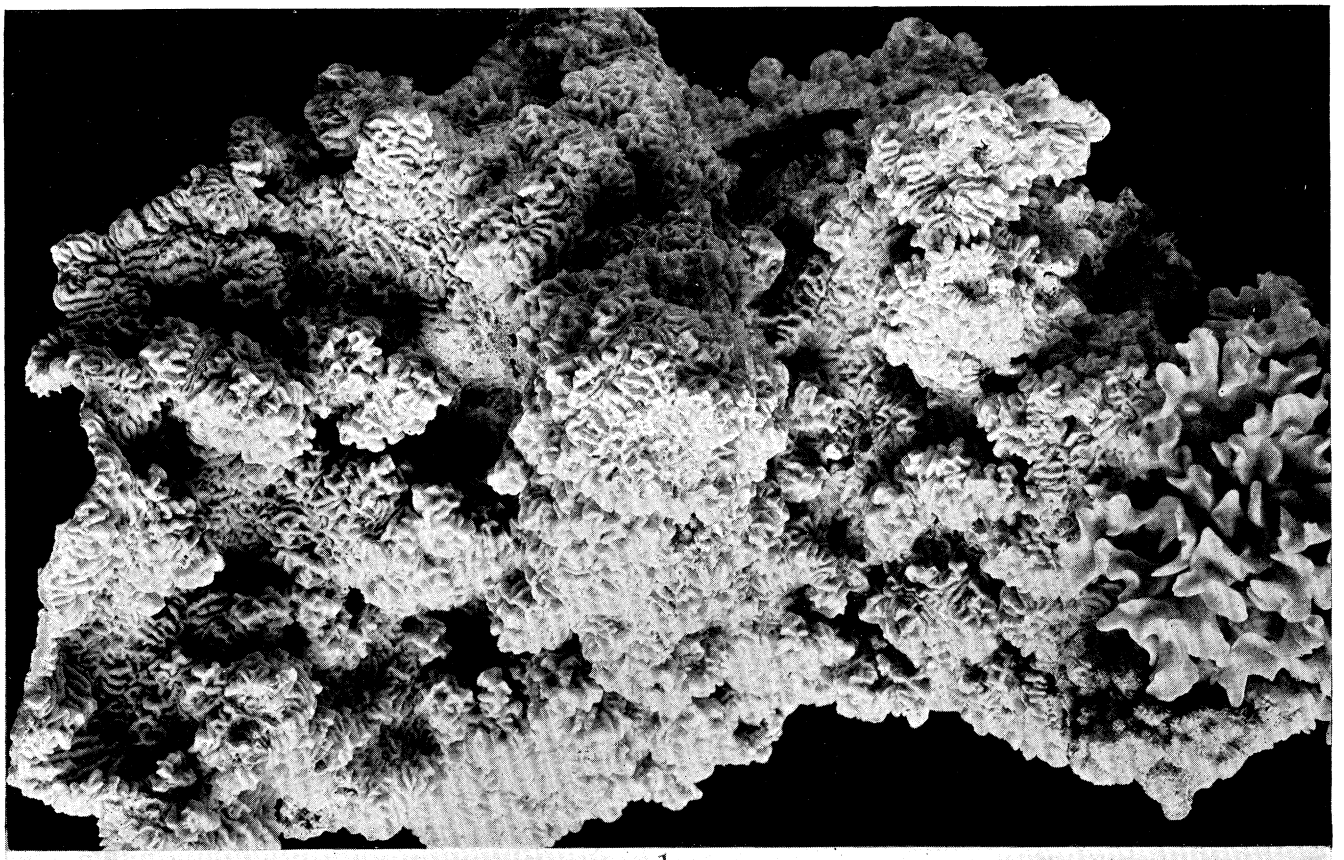

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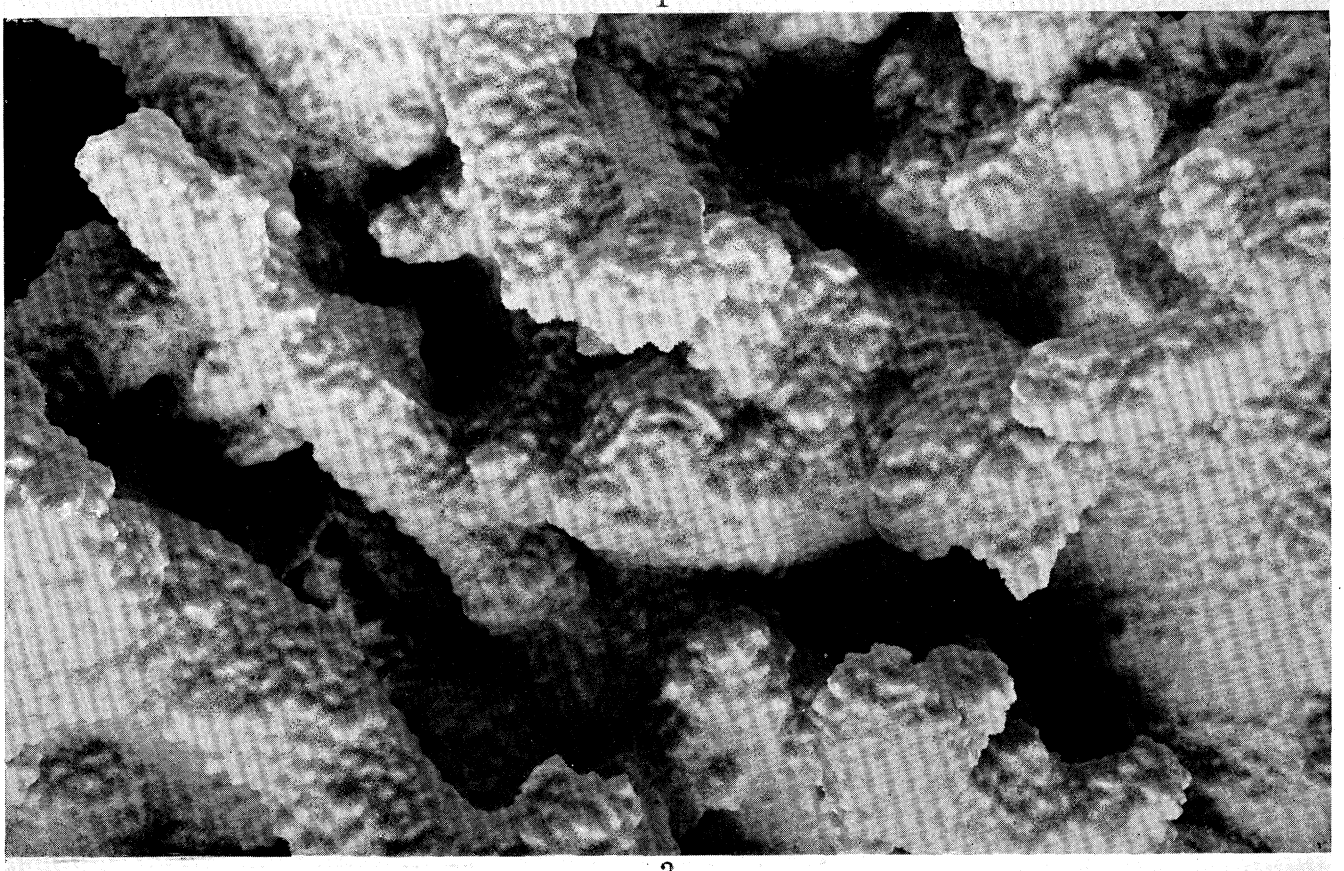

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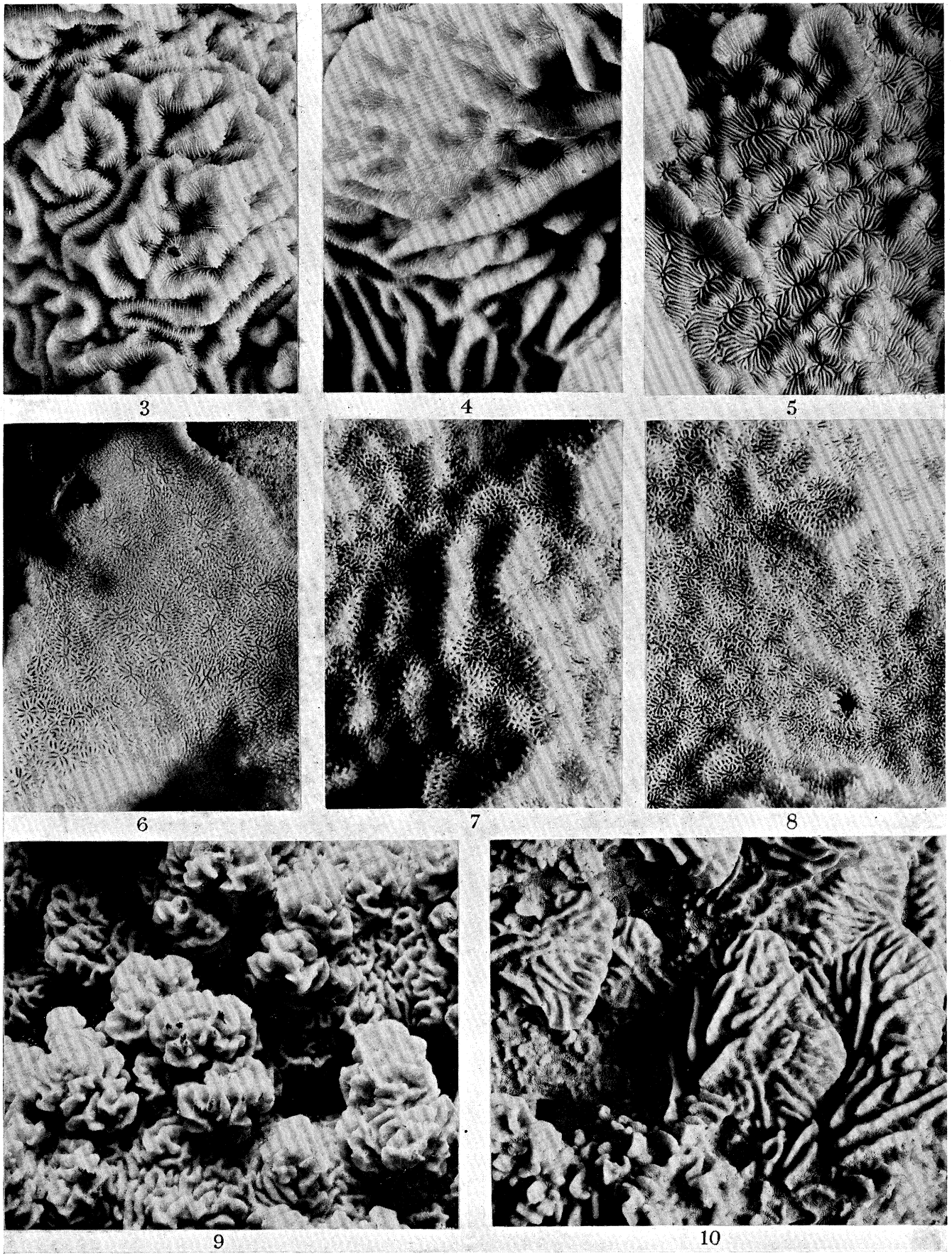

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6 7 8

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Reference

Matthai, G. 1923 Madréporaires de Nouvelle-Calédonie. *Bull. Biol.* **57**, Fasc. 1.

Explanation of plates 15 and 16

Plate 15

Figure 1. *Pavona varians* (Verrill). General view of corallum, attached to which on the right is a small corallum of *P. cactus* (Forskål) with thin, narrow, crenulate foliae. Length 23 cm., breadth 22 cm. Probably from Tahiti. $\times \frac{2}{3}$.

Figure 2. *Psammocora haimiana* Milne Edwards and Haime. General view of part of corallum. Length 31 cm., breadth 28 cm., height 14 cm. From Shore Reef, Papeari, Tahiti. Nat. size.

Plate 16.

Figure 3. *Pavona varians* (Verrill). Enlarged view of part of the calicinal surface of the corallum of figure 1, showing the typical *P. varians* facies. $\times 3$.

Figure 4. *Pavona varians* (Verrill). Enlarged view of part of the calicinal surface of the corallum of figure 1, showing *Merulina ampliata* facies. $\times 3$.

Figure 5. *Pavona varians* (Verrill). Enlarged view of part of the calicinal surface of the corallum of figure 1, showing *Hydnophora* facies. $\times 3$.

Figure 6. *Psammocora haimiana* Milne Edwards and Haime. View of part of the calicinal surface of the corallum of figure 2, showing *Pavona cactus* facies. $\times 3$.

Figure 7. *Psammocora haimiana* Milne Edwards and Haime. View of part of the calicinal surface of the corallum of figure 2, showing *Pavona varians* facies. $\times 3$.

Figure 8. *Psammocora haimiana* Milne Edwards and Haime. View of part of the calicinal surface of the corallum of figure 2, showing *Hydnophora* facies. $\times 3$.

Figure 9. *Pavona varians* (Verrill). View of part of the calicinal surface of figure 1, showing typical *P. varians*, changing into *P. maldivensis* facies. $\times 3$.

Figure 10. *Pavona varians* (Verrill). View of part of the calicinal surface of the corallum of figure 1, showing *Merulina ampliata* and *Hydnophora* facies. $\times 3$.

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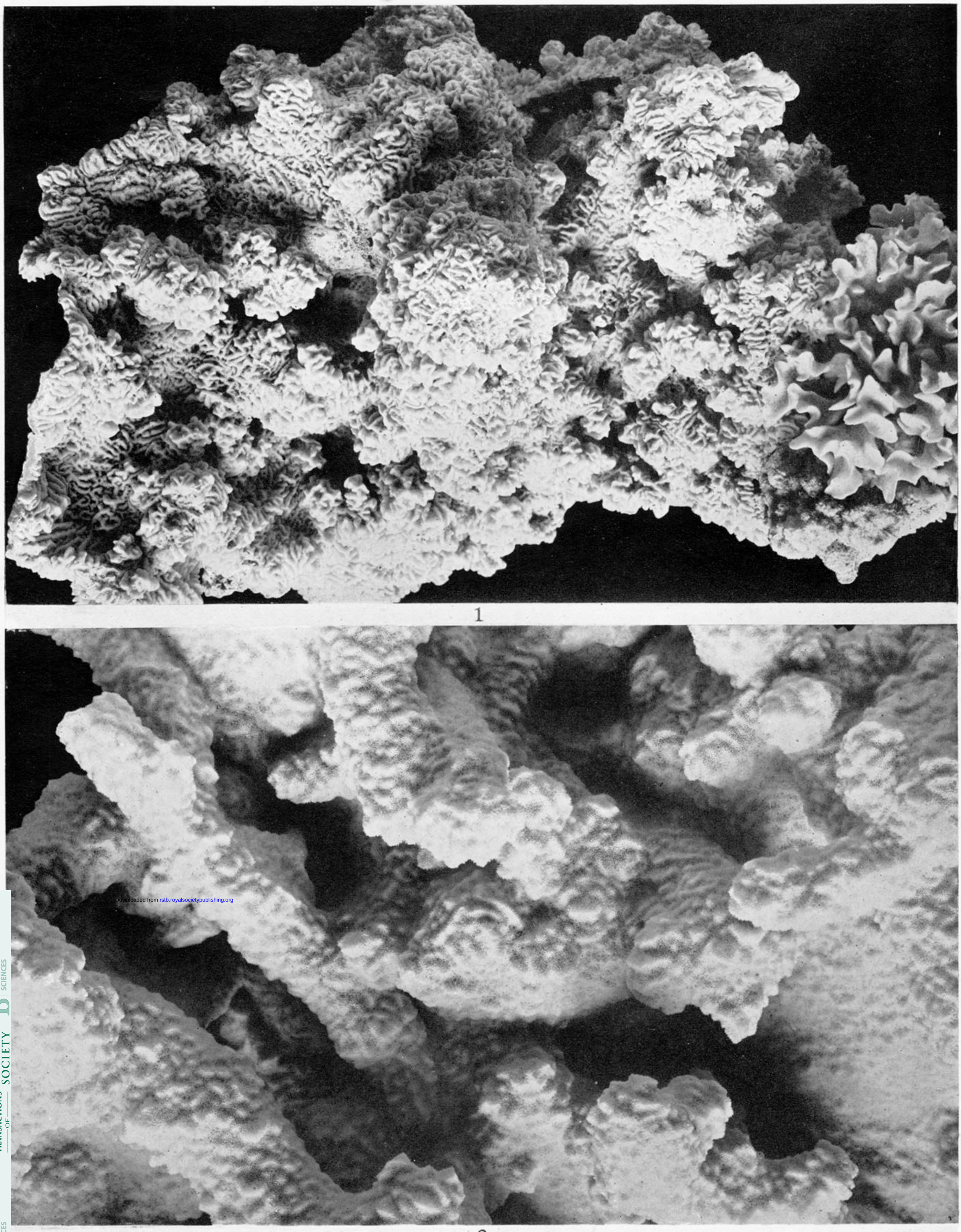

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PLATE 15

FIGURE 1. *Pavona varians* (Verrill). General view of corallum, attached to which on the right is a small corallum of *P. cactus* (Forskål) with thin, narrow, crenulate foliae. Length 23 cm., breadth 22 cm. Probably from Tahiti. $\times \frac{2}{3}$.

FIGURE 2. *Psammocora haimiana* Milne Edwards and Haime. General view of part of corallum. Length 31 cm., breadth 28 cm., height 14 cm. From Shore Reef, Papeari, Tahiti. Nat. size.

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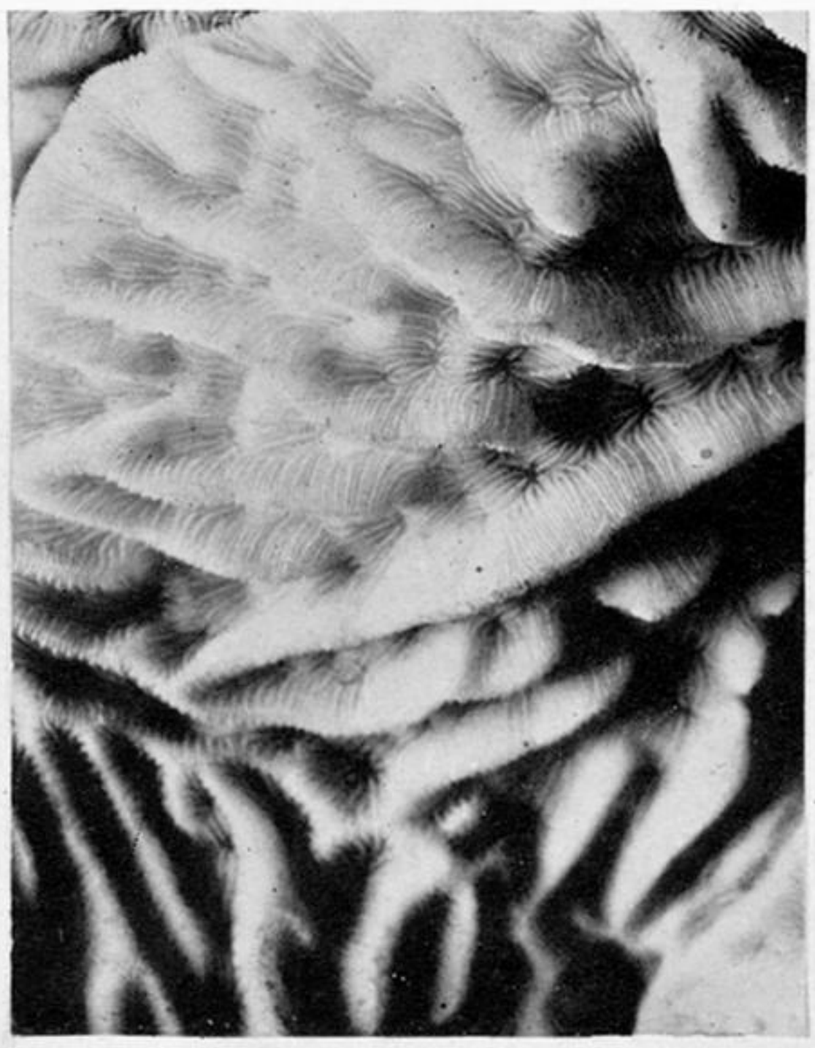

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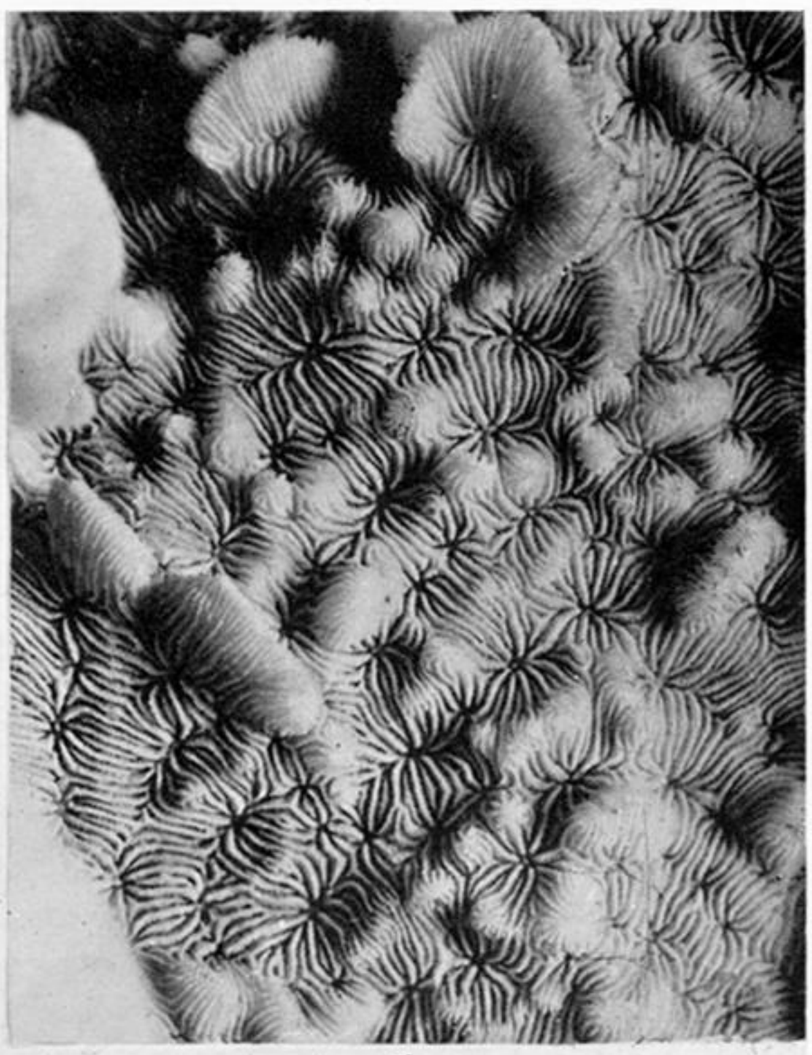

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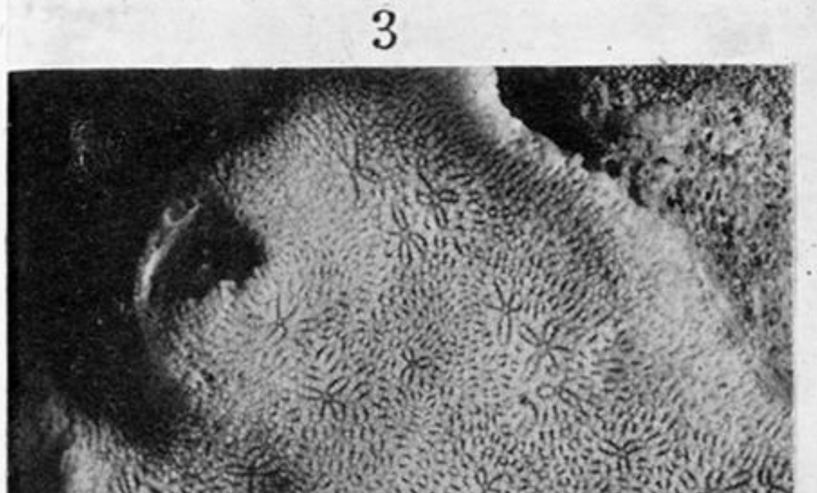

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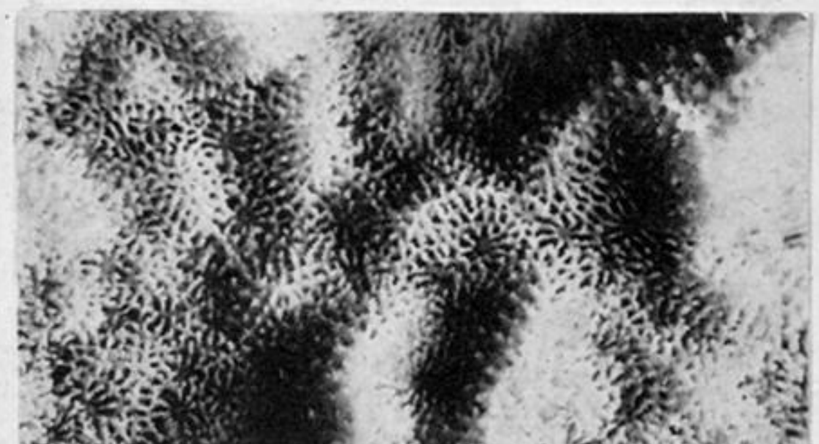

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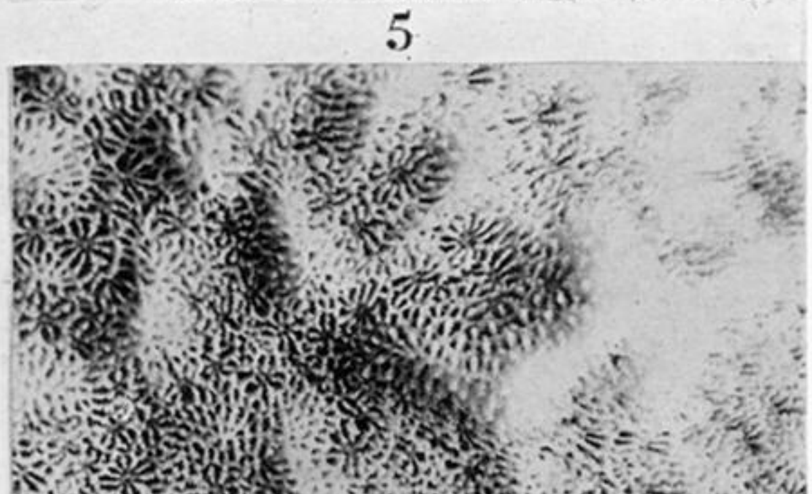

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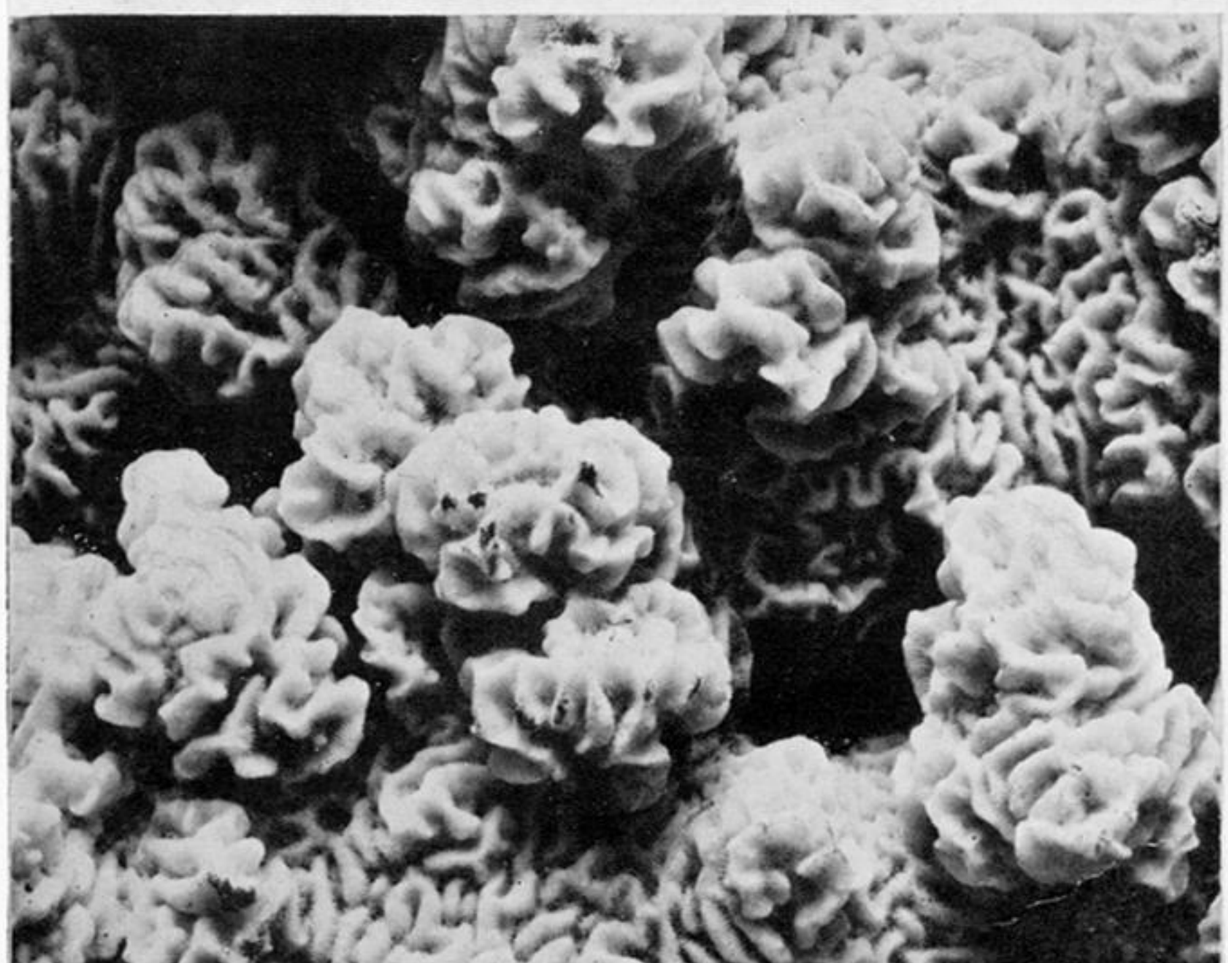

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Plate 16.

Figure 3. *Pavona varians* (Verrill). Enlarged view of part of the calicinal surface of the corallum of figure 1, showing the typical *P. varians* facies. × 3.

Figure 4. *Pavona varians* (Verrill). Enlarged view of part of the calicinal surface of the corallum of figure 1, showing *Merulina ampliata* facies. × 3.

Figure 5. *Pavona varians* (Verrill). Enlarged view of part of the calicinal surface of the corallum of figure 1, showing *Hydnophora* facies. × 3.

Figure 6. *Psammocora haimiana* Milne Edwards and Haime. View of part of the calicinal surface of the corallum of figure 2, showing *Pavona cactus* facies. × 3.

Figure 7. *Psammocora haimiana* Milne Edwards and Haime. View of part of the calicinal surface of the corallum of figure 2, showing *Pavona varians* facies. × 3.

Figure 8. *Psammocora haimiana* Milne Edwards and Haime. View of part of the calicinal surface of the corallum of figure 2, showing *Hydnophora* facies. × 3.

Figure 9. *Pavona varians* (Verrill). View of part of the calicinal surface of figure 1, showing typical *P. varians*, changing into *P. maldivensis* facies. × 3.

Figure 10. *Pavona varians* (Verrill). View of part of the calicinal surface of the corallum of figure 1, showing *Merulina ampliata* and *Hydnophora* facies. × 3.