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TWO NEW SNAKES OF THE GENUS
LAMPROPELTIS

BY FRANK N. BLANCHARD

While making a comparative study of the various forms of the genus *Lampropeltis* allied to *L. getulus getulus*, it has been found necessary to recognize two new subspecies, as follows:

***Lampropeltis getulus floridana*, new subspecies**

Plate I, Figure 1

Diagnosis: Characters in general like those of *L. getulus getulus* from which it differs in having double the number of transverse light bands, about 60; by a basal lightening of the scales of the dark areas; by a degeneracy of the chain-pattern; and by an increase of one row of scales on each side, making twenty-three.

Range: This form is known only from Florida, south from Orange County.

Type Specimen: U. S. National Museum No. 22368, female; Orange Hammock, De Soto County (northeast portion), Florida. William Palmer, collector.

Description of Type Specimen: Ventrals, 217, plus one entire anal; subcaudals, 47; dorsal scale rows anteriorly 23, changing, between the 180th and the 192nd ventral plates, to 21 rows (there are actually 24 rows for a very brief space, as from the region of the 101st to 107th ventral an additional row is interpolated between the 5th and 6th); upper labials 7 on each side; lower labials 10 on each side, the last two on the left side very small and underlying the last upper labial, and the 10th on the right minute and interpolated partly above the 9th; preoculars, one on each side; postoculars, two on each side (the inferior the smaller); temporals 2+3+4 on each side; loreal about twice as high as long and about half as high as the preocular; nasals two, the posterior slightly the larger, nostril large and between them; other cephalic shields like those of *L. getulus*; posterior chin shields about equal in length to anterior, parallel and adjacent; four gular scales between posterior chin shields and first ventral.

Total length, 1138 mm.; tail length, 134 mm.; tail divided by total length, .118.

General color in alcohol, brown. About 59 transverse brownish white dorsal bands on body and tail, these extending down on the sides to the level of about the seventh or eighth row of scales. On each side, alternating with these bands, is a similar series of transverse light bands extending upward from about the second or third row of scales to about the seventh or eighth row. Alternating with this series is a row of slightly elongate light spots overlapping the ventral plates and extending upward to about the second row of scales. This latter row of spots is one and one-half scales wide, while the

lateral and dorsal cross bars are about one-half to one scale wide. Not infrequently the lateral bars become united with the ventro-lateral spots. Each scale of the dark areas is lightened basally, the light grading distally very gradually to the darkest shade at the distal border of the scale. On the scales that take part in the light transverse bands the change from light to dark is not gradual, but sudden and sharply defined. The series of dorsal, lateral, and ventro-lateral light bars tend to be connected in the chain-pattern style of *L. getulus*. The under side is largely light, but checked with dark chiefly at the sides. Head markings like *L. getulus*; a light spot occupying the centers of the internasals, nasals, loreals, oculars, and temporals; transverse light bars anteriorly on prefrontals; a light spot anteriorly and medially on supraoculars and frontal; on parietals a light spot at each angle and one or two near the common suture; labials with the anterior and posterior, or with only the posterior, edges dark; rostral and mental edged posteriorly with dark; chin shields and gulars mostly light.

General Description: Besides the type, several specimens have been available for study, and from them the following description has been prepared. Ventrals, 211-226; subcaudals, 42-53; supralabials usually 7, sometimes 8; infralabials, 9 or 10; oculars, 1 and 2; temporals, 2+3+4; posterior chin shields about equal in length to the anterior, parallel and sometimes separated by a scale; loreal rectangular, higher than long or about as high as long, in one specimen fused with the posterior nasal. Maximum number of scale rows usually 23, sometimes 21; formulae 23-21; 23-21-23-21-19; 21-23-21-19; 21-19. Tail .100 to .150 of total length. Pattern similar to *L. getulus*, except that the transverse light bands on the back are about double the number on the latter species, varying from 46 to 75, with an average of 64. In distinction from *L. getulus* the

forking on the sides is irregular or obsolete, the cross bands on the back ending abruptly at about the level of the seventh row of scales. Alternating with the dorsal cross bands is a series of transversely elongated light spots, about two scales wide, extending from about the second to the seventh row of scales. Alternating with the latter is a series of light spots about two scales long which overlap the ends of the gastrosteges and the first row or two of dorsal scales. The scales of the light bands are often sharply tipped with black. Furthermore, and in distinction from *L. getulus*, each scale of the dark area has a development of white, beginning at its basal end and spreading distally to cover one-half to three-quarters of its area. This basal lightening of the dark scales may be so pronounced as to greatly obscure the pattern of alternating transverse bands of white. The belly is checked with black and white, the actual colors varying from white to creamy white or yellow, and from black to yellowish brown.

Each branch of the copulatory organ may be described as follows: Strongly bifurcate, the forks one-fifth the total length of the organ; sulcus single, extending over the side of the larger fork, and down the inner side of the V, distal surface smooth, succeeded proximally by a few slightly fringed calyces; short fringes rapidly becoming modified into small spines which increase in size basally, and, one-half way down the organ, stop abruptly; basal half of organ smooth except for a few scattered minute spines, chiefly near the large ones; no spines distinctly enlarged.

The skull is essentially like that of *L. getulus*. A specimen from Orange Hammock, De Soto County, Florida (U. S. N. M., No. 22367) has the following dental characters: maxillary teeth increasing very gradually in size posteriorly, the last three slightly larger than those preceding, 15 on each side; mandi-

LIST OF SPECIMENS OF *Lamipropeltis getulus floridana*

Explanation.—When there are two numbers in one space, the upper refers to the left side, the lower to the right. Ab-
 reviations: A. M. N. H.,—American Museum of Natural History; U. S. N. M.,—United States National Museum; P. M.
 of W.,—Public Museum of Milwaukee. Lengths are in millimeters.

| MUSEUM NUMBER | LOCALITY | SEX | SCALE FORMULA | VENTRALS | | | | | | | TOTAL LENGTH | TAIL DIVIDED BY TOTAL LENGTH | CROSS BANDS |
|----------------|---|--------|----------------|------------|--------------|--------------|---------|-----------|-------|---------------------|--------------|---------------------------------|-------------|
| | | | | SUBCAUDALS | SUPRALABIALS | INFRALABIALS | OCULARS | TEMPORALS | 9 | 10 | | | |
| U.S.N.M. 5509 | Charlotte Harbor, De Soto County, Fla. | Male | 23-21-23-21-19 | 222 | 43 | 8 | 10 | 1-2 | 2-3-4 | 1450 | .110 | 50 | |
| U.S.N.M. 22367 | Orange Hammock, De Soto County, Fla. | Male | 21-23-21-19 | 222 | .. | 7 | 9 | 1-2 | 2-3-4 | Tail im- perfect | To | vent 70 | |
| U.S.N.M. 22368 | Orange Hammock, De Soto County, Fla. | Female | 23-21 | 218 | 47 | 7 | 10 | 1-2 | 2-3-4 | 1155 | .118 | 59 | |
| U.S.N.M. 36478 | Widden's Landings, Kissimmee River, Fla. | Male | 21-23-21-19 | 219 | 52 | 7 | 9 | 1-2 | 2-3-4 | 1612 | .122 | 74 | |
| U.S.N.M. 36479 | Widden's Landings, Kissimmee River, Fla. | Female | 23-21-23-21-19 | 215 | 42 | 7 | 9 | 1-2 | 2-3-4 | 1074 | .107 | 65 | |
| U.S.N.M. 36564 | Lemon City, Fla. | Male | 21-23-21-19 | 223 | 53 | 7 | 9 | 1-2 | 2-3-4 | Skin of adult | | 75 | |
| U.S.N.M. 61276 | Florida | Male | 21-23-21-19 | 218 | 48 | 7 | 9 | 1-2 | 2-3-4 | 1392 | .137 | 55 | |
| A.M.N.H. 5937 | Kissimmee Prairie, Fla. | Female | 21-23-21-19 | 217 | 50 | 7 | 9 | 1-1 | 2-3-4 | 1114 | .122 | 60 | |
| A.M.N.H. 5938 | Kissimmee Prairie, Fla. | Male | 21-22-21-19 | 221 | 52 | 7 | 9 | 1-2 | 2-3-4 | 1551 | .125 | 70 | |
| A.M.N.H. 5939 | Kissimmee Prairie, Fla. | Male | 21-19 | 226 | 52 | 7 | 10 | 1-2 | 2-3-4 | 1445 | .118 | Obso- lete | |
| A.M.N.H. 5940 | Kissimmee Prairie, Fla. | Male | 21-19 | 223 | 46 | 7 | 9 | 1-2 | 2-3-4 | 1031 | .123 | Obso- lete | |
| A.M.N.H. 6935 | Orlando, Orange Co., Fla. | Female | 21-23-21-19 | 216 | 46 | 7 | 10 | 1-2 | 2-3-4 | 1060 | .124 | 56 | |
| P.M.ofW. 621 | Gotha, Fla. | Male | 23-21-23-21-19 | 222 | 53 | 7 | 9 | 1-2 | 2-3-4 | 841 | .146 | 49 | |
| P.M.ofW. 622 | Gotha, Fla. | Female | 21-23-21-19 | 212 | 43 | 7 | 9 | 1-2 | 2-3-4 | 954 | .124 | 57 | |
| | Vero, St. Lucie Co., Fla. | | 23-21-23-21-19 | 211 | dry | skin | | | | | | 52 | |

bular teeth somewhat larger anteriorly, decreasing in size posteriorly, sixteen on each side; palatines strong, subequal, 19 on the left side and 17 on the right.

The largest specimen examined was from the Kissimee River, Florida, and measured 1612 mm.

Affinities: That this form is most closely allied to *L. getulus* is plainly evident from its form, proportions, markings, copulatory organ, skull, and scutellation. Its pattern is obviously derived from that of the latter by an obliteration of the narrow forks on the sides, and an increase in the dorsal and lateral white markings. It is uncertain just how this pattern was derived; but some of the specimens indicate that it may have taken place by the development of new transverse bands from the white central scales midway between the original bands, and by a splitting into two of each white blotch in the ventrolateral series; or the increase in number of cross bands may be principally due to a shortening of the dark interspaces. Correlated with the increase in number of white cross bars there occurs a lightening of each dark scale which began near its base and extended from there basally, and then distally, until all the area of these scales, except the distal margin, was lightened. The isolation of this form in the peninsula of Florida, the fact that no *Lampropeltis* is known from the West Indies, and the juxtaposition of its range to that of typical *L. getulus* allows of derivation from the latter species only.

Remarks: The form here named *floridana* has hitherto been included under the name of *L. getulus*. The striking differences between some of the specimens from southern Florida and the typical form from northern Florida and the other Atlantic States has not been unnoticed. Loennberg (Proc. U. S. Nat. Mus., Vol. 17, 1894, pp. 324-5) found examples of this subspecies in southern Florida, but considered them only as

atypical *L. getulus*. A. E. Brown (Proc. Acad. Nat. Sci., Phila., 1904, p. 472) said that "while no subspecific distinction is warranted, most Florida examples of *Ophibolus getulus getulus*, which is the most vigorous and extended species [of *Ophibolus*], seem to be rather generalized in the character of the dorsal spots and bands, as between the northern species of the same form and the Louisianan *O. getulus sayi*." Ditmars (The Reptile Book, 1907, pp. 359-360) says "the jet-black specimens from the northern portion of the range [referring to *L. getulus*, with their vivid white markings] are in strange contrast with pale, greenish specimens without bands, from Florida, but a varietal name would be inappropriate as every degree of connecting variations may be found in a large series of specimens." However, the fact that typical *L. getulus* appears to be entirely replaced in the southern half of Florida by an allied form which differs from it in numerous essential respects makes it clear to the writer that a "varietal name" is not only appropriate, but necessary.

***Lampropeltis getulus yumensis*, new subspecies**

Plate I, Figure 2

Diagnosis: In scalation, proportions, and pattern, essentially like *L. getulus boylii*, from which it differs in that the scales of the light areas are shaded basally with brown, thus giving a spotted appearance to the light annuli. From this form and from *L. getulus conjuncta* (Cope) of the Cape Region of Lower California (with which it has been confused) it may be distinguished by the fact that the white bars on the pre-frontal plates are oblong and occupy not more than one-half the area of these scutes, instead of being convex behind and occupying nearly all their area. Furthermore, in *L. getulus conjuncta* the infralabials are usually 10, and in *L. getulus yumensis* they are usually 9.

Range: The southern third of Arizona (except the portion south and east of Tucson), extreme southeastern California, and the desert region about the head of the Gulf of California.

Type Specimen: U. S. National Museum No. 61318, male; 27 miles west of Indian Oasis, Pima County, Arizona; collected by A. B. Howell, July 7, 1918.

Description of Type Specimen: In general with the characteristics of *L. getulus boylii*. Ventral plates, 230, plus one entire anal; subcaudals, 52 pairs; 7 upper and 9 lower labials on each side; one pre- and 2 post-oculars on each side, of the latter the more ventral is the smaller; temporals, on each side, two in the first row and three in the second. Loreal a little longer than high, the upper posterior angle broadly obtuse, the lower acute. Posterior chin shields a little more than half the length and width of the anterior, and separated from each other by two smaller scales. Other cephalic shields normal. Scale rows anteriorly 23 (one less on the left side between the 24th and 34th ventrals and on the right between the 21st and 26th), changing, at about the level of the 146th ventral on the left side and the 140th on the right, to 21, and, at the level of the 182nd ventral, to 19, the formula being thus 23-21-23-21-19.

Total length 1060 mm.; tail length 134 mm.; tail length divided by total length .127.

General color (hardened in formalin and preserved in alcohol) black or very dark brown. From head to tip of tail the body is crossed by 37 white annuli, the scales of which are white with dark brown at the bases. Three scales close behind the parietals have each a white dot. The first complete ring is about twelve scales behind the parietals. The four or five succeeding rings are split on the middorsal line and alternated. The annuli are from one-half to one scale wide on the middorsal line, increasing to about three or four scales wide on the

first row of scales. The basal shading is not evident on a few of the lower scales, but is usually conspicuous and often occupies as much as half the area of a scale. The belly presents the appearance of being checkered with large quadrate black and white areas. This is due to the fact that the black and white annuli often partly, and sometimes completely, alternate with each other. The white ventral scutes are usually dark brown at the base, and this shading is progressively intensified posteriorly. The ground color of the head is black. Across the prefrontals and internasals is a broad transverse bar of white; the rostral is white with a black border on the sides and above; the nasals, loreals, oculars, first two left temporals, and upper first right temporal have each a white center; the lowest temporals of the second rows each have a white spot; there is a white spot, antero-ventrally, on each supraocular. The contiguous edges of the labials and of the chin shields are black. The common black borders of the third and fourth and of the fifth and sixth upper labials are much widened.

General Description: On the numerous other specimens at hand the following description has been based: Ventral plates 216-241; subcaudals 44 to 57 (males, 50-57, average 54; females 44 to 51, average 48); supralabials 7 (rarely 8); infralabials 9, sometimes 10; oculars 1 and 2; temporals usually 2+3+4; posterior chin shields but little more than half as long and half as wide as anterior, and separated from each other by two small scales; loreal longer than high. Dorsal scale rows usually 23-21-19, sometimes 23-25-23-21-19 or 23-21-23-21-19. The tail varies from .09 to .14 of the total length (males, .121 to .132, average .127; females, .093 to .128, average .117). The whitish annuli vary in number from 29 to 45, the average being about 37.

This form seems not to differ in size or proportions from *L. getulus boylii*. The largest specimen examined was from the Graham Mts., Arizona, and measured 1204 mm.

Each branch of the copulatory organ is bilobed; the sulcus spermaticus is single, passes over one of the lobes, and ends in a small smooth area at the apical end of the organ. The calyces are few, their fringes fairly conspicuous or very short; the latter pass into spines, which increase gradually in size until about one-third the way toward the base of the organ. Here they stop suddenly, and, over about one-half the distance from here to the base, numerous minute spines may be barely distinguishable. The basal portion is smooth. No spines are distinctively enlarged or isolated from the others.

The skull is like that of *L. getulus boylii*. The dentition is as follows: maxillaries commonly 13 to 14; mandibulars 14 to 17; palatines 9 or 10; pterygoids 12 to 19; anterior mandibulars larger than posterior; last two maxillaries somewhat stouter than those preceding.

The pattern, like that of *L. getulus boylii*, is of white rings on a black ground color, but, unlike the latter, the white scales of these rings are marked basally with brown, which sometimes extends irregularly over the scales so as to greatly obscure the rings. The latter are narrow on the back, one to two and a half scales in width, widening on the sides to about two to five scales, and traversing the belly. As with other forms having the metamorphic pattern, the rings may be broken on the middorsal or midventral line and alternated for a greater or less distance, instead of united.

The white bars across the prefrontals and internasals, which are characteristic of all the forms allied to *L. getulus boylii*, occupy here not more than half the area of their respective head plates. Beneath the eye there is usually a rather conspicuous

enlargement of the dark border common to the third and fourth upper labials. Markings on the posterior portion of the head are infrequent.

The belly is usually crossed by the continuations of the black and white rings, but, like the dorsal white scales, the white ventral plates are usually conspicuously edged basally with dark brown. Rarely the belly and head are without white markings.

Affinities: This form intergrades with *L. getulus splendida* (Baird and Girard) in the vicinity of Tucson, Arizona, and east and south of there. In the region of the Florence River, in Arizona, it passes into *L. getulus boylii* (Baird and Girard), and in Imperial County or eastern San Diego County, California, it like-wise intergrades with this form.

Remarks: Heretofore *yumensis* has been regarded as practically identical with examples from the Cape Region of Lower California, named by Cope *conjuncta* (Proc. Acad. Nat. Sci., Phila., 1862, pp. 301-302). This resemblance is, however, only apparent. Examination of all the material available has made it clear to the writer that these two forms need never be confused, that indeed they are not even related directly,—only through *boylii* can *conjuncta* be derived from *yumensis*.

Its distinctness from *conjuncta* will be more clearly brought out in a subsequent review of the genus, but it may be well to point out here (1) that the range of *conjuncta* is separated from that of this form by an extension of the range of *boylii* into Lower California at least as far south and east as the San Pedro Martir Mountains; (2) that *conjuncta* shows closer affinities with *boylii* than with this form in the pattern and scalation of the head, and in the fact that its young are indistinguishable in the coloration of the white rings from the young

LIST OF SPECIMENS OF *Lampropeltis getulus yumensis*

Explanation.—When there are two numbers in one space, the upper refers to the left side, the lower to the right. Abbreviations: U. of C.,—University of California; U. of A.—University of Arizona; U. S. N. M.,—United States National Museum; A. N. S.,—Academy of Natural Sciences of Philadelphia; U. of M.,—University of Michigan; S. U.,—Stanford University. Lengths are in millimeters.

| MUSEUM NUMBER | LOCALITY | SEX | SCALE FORMULA | VENTRALS | SUBCAUDALS | SUPRALABIALS | INFRALABIALS | OCULARS | TEMPORALS | TOTAL LENGTH | TAIL DIVIDED BY TOTAL LENGTH | RINGS | |
|------------------------|--|--------|------------------------|----------|------------|--------------|--------------|---------|----------------------|------------------|------------------------------|-------|----|
| U.S.N.M. 4284 | Ft. Yuma, Calif. | Female | 23-25-23-21-20 | 241 | 50 | 7 | 9 | 1-2 | 2-3 | 1005 | .116 | 39 | |
| U.S.N.M. 15969 | Yuma, Ariz. | Male | 23-21-23-21-19 | 229 | 52 | 7 | 9 | 1-2 | irreg- 3-4 2-3 | 932 | .121 | 41 | |
| U.S.N.M. 21720 | San Domingo, Sonora, Mexico | Male | 23-21-19 | 232 | 55 | 7 | 9 | 1-2 | 2-4 | 1394 | .125 | 38 | |
| U.S.N.M. 37532 | Volcano Lake, L. C. | Female | 23-21-19 | -- | 231 | 44 | 7 | 9 | 1-1 | 2-3 | skin of adult | | 36 |
| U.S.N.M. 37534 | Yuma, Ariz. | Female | 23-25-23-21-19 | 237 | 49 | 7 | ? | 1-2 | 2-3 | 410 | .120 | 42 | |
| U.S.N.M. 44530 | Yuma, Ariz. | | 23 specimen incomplete | | | 7 | 10 | 1-2 | 2-3 | | | .. | |
| U.S.N.M. 51761 | Ash Creek, Graham Mts., Ariz. | Female | 23-21-19 | 226 | 47 | 7 | 9 | 1-2 | 10 2-3 | 1204 | .118 | 30 | |
| U.S.N.M. 54717 | San Carlos Ind. Res., Calva, Ariz. | Male | 23-21-19 | 223 | 55 | 7 | 9 | 1-2 | 2-4 2-3 | skin of adult | | 33 | |
| U.S.N.M. 61318 | type 27 miles W. of Indian Oasis, Pima Co., Ariz. | Male | 23-21-23-21-19 | 231 | 52 | 7 | 9 | 1-2 | 2-3 | 1060 | .127 | 37 | |
| U. of C. 1836 | Colorado River, 10 mi. below Cibola, Ariz. | Male | 23-21-19 | 231 | 57 | 7 | 9 | 1-2 | 2-4 2-3 | 854 | .132 | 42 | |
| U. of C. 1837 | Colorado River at Pilot Knob, Calif. | Male | 23-21-19 | 225 | 55 | 7 | 10 | 1-2 | 9 2-3 | 900 | .131 | 38 | |
| U. of C. 1838 | Colorado River, 5 mi. N. E. of Ft. Yuma, Calif. | Female | 23-21-19 | 222 | 44 | 7 | 9 | 1-2 | 2-3 | 1019 | .093 | 29 | |
| U. of A. Tucson, Ariz. | | Male | 23-21-19 | 213 | 47 | 7 | 10 | 1-2 | ? 2-3 | 345 | .122 | 36 | |
| U. of A. Yuma, Ariz. | | Male | 23-21-20 | 220 | 50 | 7 | 9 | 1-2 | 2-3 | | | 29 | |
| U. of M. 52252 | Tucson, Ariz. | Female | 23-21-19 | 230 | 47 | 7 | 9 | 1-2 | 2-3 | 1172 | .121 | 33 | |
| A. N. S. 3574 | Ft. Yuma, Calif. | Female | 23-21-19 | 240 | 51 | 7 | 9 | 1-2 | 10 3-3 | 912 | .121 | 35 | |
| S. U. 1710 | Ft. Lowell, Ariz. | Male | 23-21-19 | 219 | 49 | 7 | 9 | 1-2 | 2-3 | 1106 | .128 | 37 | |
| S. U. 4004 | Ft. Grant, Graham Co., Ariz. | Female | 23-21-19 | 216 | 46 | 7 | 9 | 1-2 | 2-4 2-3 | 391 | .128 | 35 | |

and adults of *boyllii*; and (3) that the basal shading of the white scales, which has resulted in the confusion of the southern Arizona specimens with those from the Cape Region, may well have been derived by *conjuncta* directly from *boyllii*, since the latter shows this character sporadically throughout its range.

LAMPROPELTIS GETULUS FLORIDANA
LAMPROPELTIS GETULUS YUMENSIS

PLATE I

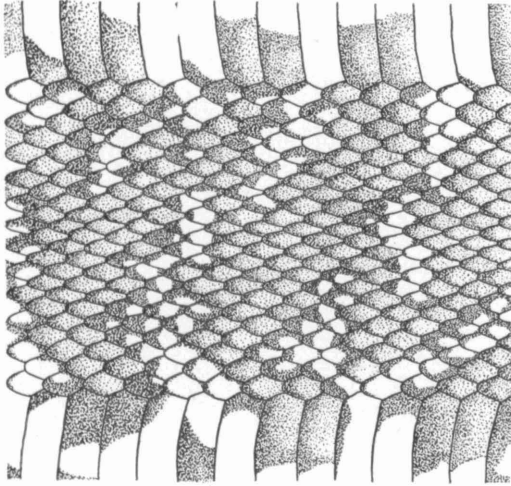


Figure 1

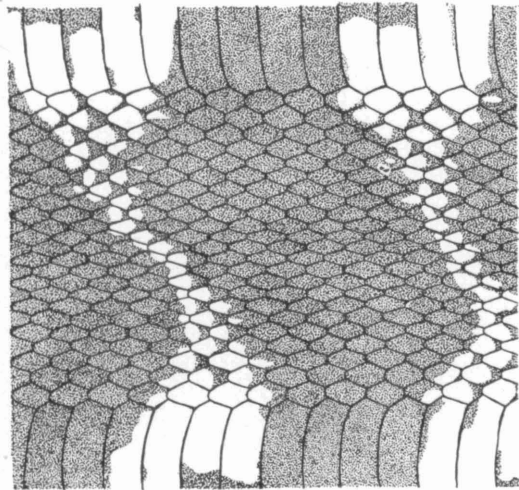


Figure 2

