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(With Three Plates)

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(With Three Plates)

Although several workers have investigated certain of the ductless glands of reptiles, very little has been done upon these glands in the Crocodilia; so it has seemed worth while to work out the main features in the gross and microscopic structure of these organs in the alligator. Live animals from 2 to 3 feet long were obtained from a regular dealer and the glands were removed, fixed with various reagents, sectioned, and stained with the usual stains, mostly haematoxylin and eosin. Most of the researches of the author upon the Crocodilia have been made possible by grants from the Smithsonian Institution, the Carnegie Institution of Washington, and the Elizabeth Thompson Science Fund.

THE ADRENALS

According to Swale Vincent (11), the first definite description, with figures, of the adrenals was written by Eustachius in 1563; but so little attention was paid to these organs that Fabricius, as late as 1738, makes no reference to them.

At the present time, although the literature is very extensive, but little work has been done upon the anatomy of the adrenals in the Reptilia and almost nothing upon those of the Crocodilia. In man the cortical portion of the adrenal makes its appearance, in embryos of about 6 mm. in length, as a series of buds from the coelomic epithelium in the dorsal body wall, which later fuse to form a mass on each side of the base of the mesentery. The medulla of the adrenal arises, at about the same time, from the neural crest of the embryo in connection with the origin of the sympathetic nervous system, the "sympathochromaphil" tissue. Later the chromaphil tissue differentiates from the sympathetic nervous tissue, and by the time the embryo is 19 mm. in length the chromaphil bodies have begun to penetrate the above-mentioned cortical masses. At 9 or 10 cm. the chromaphil cells are seen as groups or islands among the strands of the cortex. It is interesting to note that this embryonic condition of man is quite similar to the adult condition in some reptiles and birds.

Different investigators have claimed to have found structures that might be called adrenals in various invertebrate animals. It seems doubtful if these claims can be substantiated, at least for the cortex. According to Swale Vincent (11) the cyclostomes are the lowest chordates in which adrenal structures are certainly known to be found. In the various vertebrate classes the adrenals are, of course, variously developed. In the selachians, for example, the region known as the cortex in man is represented by a median, elongated body, the inter-renal, lying between the kidneys; while the medulla of the human adrenal is represented by a series of small paired masses of chromaphil tissue closely associated with the sympathetic ganglia, called by Balfour the "suprarenals." The Amphibia, as in other ways, exhibit a somewhat transitional condition in which the close association of the chromaphil or medullary tissue with the sympathetic nervous system is partially lost.

In Reptilia and Aves, as has been said, the chromaphil penetrates the inter-renal or cortical mass without forming the definite central mass known in the Mammalia as the medulla.

In the alligator, *Alligator mississippiensis,* the adrenals are yellowish, elongated bodies, between and anterior to the kidneys; they are closely associated with the anterior two thirds of the gonads and with the aorta and the post caval vein.

Plate 1, figure 1, represents a transverse section through the adrenals (*ad*), and the adjacent ovaries (*o*). In this region the adrenals are somewhat circular in section, in other regions they are flattened. They are united with the ovaries (*o*), and the dorsal aorta (*ao*), by a thick mass of connective tissue which is indistinctly differentiated into a surrounding capsule (*c*), for each gland. The intercolumnar spaces in the glands here figured were not as distinct as in the gland shown in the following figure and are not indicated.

The microscopic structure of the adrenal is shown in figure 3 (pl. 1), which was drawn under a camera lucida, with a magnification of about 500 diameters.

As noted above, the cortex and medulla are not sharply segregated into two regions as in the mammals, but the latter is seen as scattered groups of cells, chiefly in the interspaces between the strands or columns of the cortex. According to Vincent the conditions in Crocodilia and birds are "almost identical."

The cortical and medullary (or chromaphil) cells are easily distinguished from each other in material fixed in chromium salts, by the fact that the latter become colored from brown to bright yellow and stand out in strong contrast to the paler cortical cells.

In a medium-power view of the entire cross section of the gland (fig. 2, pl. 1) the chromaphil cell groups are seen to be much more numerous near the periphery of the gland, especially on the dorsal side, under the capsule, than in the more central region. The region shown in figure 3 is about mid-way between the center and the periphery.

The cortical cells form a compact mass, near the periphery, the interspaces of which seem almost completely filled by the medullary or chromaphil cells; but towards the center they separate into thick irregular columns or strands (fig. 2, *cc*) with wide interspaces (fig. 3, *is*). Some of the chromaphil masses seem to lie imbedded in the sides of these cortical columns rather than in the interspaces. The intercolumnar spaces are largely occupied by capillaries or sinuses in which blood corpuscles are seen.

As shown in figure 3, the cortical masses are made up of clear, finely granular, irregular cells, whose walls are difficult or impossible to see, in many places. The nuclei are of average size, usually spherical or oval in shape and are rather finely granular.

Each column of the cortex seems surrounded by a sort of basement membrane or pavement epithelium (*en*) in which occasional flattened nuclei may be seen. This epithelium represents the endothelium of the capillaries of the intercolumnar spaces mentioned above. There is apparently no other intercolumnar connective tissue.

The medulla or chromaphil material, as has been said, consists of masses of yellow or brown cells (in tissue fixed in chromic acid) lying between the cortical columns (figs. 2 and 3, *mc*). These cell-masses vary not only in color, the yellow cells mostly lying peripheral to the brown, but also in size and shape. The outlines of their constituent cells are even harder to see than those of the cortical cells, but the cells are easily distinguished from the adjacent cortical cells by their coloring. The nuclei apparently do not differ from those of the cortical cells; they often lie so close together that, if each one represents a cell, the medullary cells must be somewhat smaller, as a rule, than those of the cortex. In Uromastix, according to Vincent (11), the chromaphil cells are larger than the cortical. The chromaphil cells are more distinctly and more coarsely granular than are the cortical cells. No difference could be determined with certainty between the adrenals of an animal after a prolonged fast and one during the feeding season, unless, possibly the chromaphil tissue in the former may be somewhat more in evidence than in the latter. The tissue available, however, was not sufficiently abundant to determine this point with entire certainty.

THE THYROID AND PARATHYROID GLANDS

The thyroid gland in the alligator is a small, bilobed structure (pl. 1, fig. 4, *ty*) lying across the ventral surface of the trachea at the level of the auricular end of the heart. In a 40 cm. animal, the gland is of the size shown in figure 4. It consists of an oval or spherical lobe on each side and an interlobular portion or isthmus. The isthmus is relatively thick and short so that the lateral lobes are not sharply distinguishable from it as in some of the higher vertebrates. The gland has a reddish color and is easily removable without distortion from the body. The microscopic structure of the gland does not present any very unusual features. It is surrounded by a fibrous capsule (pl. 1, fig. 5, *c*), which seems to consist of two layers; the capsule has a tendency to separate, as shown in figure 5, into an inner and an outer part.

The alveoli are, in some cases, very closely arranged; in other glands they are more widely separated by interstitial connective tissue, blood vessels and empty sinuses. In some cases the majority of the alveoli contain colloid; in other cases most of them are empty. Higher magnification shows the alveoli to be lined with the usual single layer of cubical or columnar cells (fig. 6) with large, spherical or compressed nuclei. The cells are clear or finely granular, the nuclei are coarsely granular. Even in tissue that seems otherwise perfectly fixed the walls between the cells can seldom be demonstrated. In some alveoli the cells are large; in other alveoli, especially in those free of colloid (pl. 1, fig. 6, *A*) the cells are small and seem compressed, so that adjacent nuclei are almost in contact with each other.

Closely adherent to the lobe of the thyroid gland (fig. 5, *pt*) is a very small body which, at first, looks like scarcely more than a thickening of the fibrous capsule of the thyroid. More careful examination, however, brings to light certain structures that would seem to indicate that this small body is either the parathyroid or the post-branchial body or probably both. Swale Vincent (11) says that these two bodies are closely united in some of the other reptiles and that they are subject to much variation. He figures the combined bodies from some unnamed animal but from the figure it is difficult to see any great difference between them, or to determine where one organ ends and the other begins.

In the small amount of alligator material examined, no vesicles of large size were present and no colloid was seen. Figure 7 (pl. 1) represents a portion of the organ under consideration as seen under moderately high magnification. The fairly distinct capsule (*c*) is continuous with the capsule of the thyroid gland. The main body or stroma is composed of a very indefinite, finely granular material, the structure of which is very difficult to determine. It stains with eosin, and contains scattered nuclei which stain deeply and are smaller and more irregular than the nuclei in the thyroid. This material in places gives the impression of irregular, indistinct cells; in other places it has almost a fibrous appearance. Numerous irregular spaces are seen in it.

The two characteristic structures of this organ are the degenerate alveoli, and the structures that Vincent calls " Hassall's corpuscles " from their resemblance to that characteristic feature of the thymus gland.

The alveoli (fig. 7, *a*) are small and under low magnification have the appearance of thick-walled blood vessels. Under higher magnification the alveoli have the appearance of being in different stages of degeneration, although whether this is really so the writer is not prepared to say. The alveolus figured has a thick granular wall in which two sets of small, irregular nuclei are scattered, and in which no indication of transverse cell walls is seen. One set of oval or spherical nuclei lies close to the lumen, into which many of the nuclei project. The other nuclei form an indistinct layer around the periphery of the alveolar wall.

Surrounding these structures is a fairly distinct layer of dense material resembling fibrous connective tissue; this is one reason for the resemblance of the alveolus to a blood vessel noted above. The resemblance of these alveoli to degenerate alveoli of the thyroid would lend support to the view, held by some, that the alveoli of the two glands are the same.

The other structures, the so-called " Hassall's concentric corpuscles " (*hc*) are small collections of nuclei, mostly spindlelike or crescentic in shape, that are arranged in concentric circles very much as in the true Hassall's corpuscles of the thymus gland. No empty space is seen in the corpuscle, the center of the circle being occupied by a group of small, round nuclei. Besides these concentric groups, other smaller groups of nuclei are seen which do not show any concentric arrangement. The outlines of the cells to which the nuclei belong could not be determined.

Besides this small mass of parathyroid or post-branchial tissue, imbedded in the side of the thyroid gland, there are several small, more or less spheroidal bodies situated on each side of the neck, near, or even imbedded in the thymus glands. They are so small—about the size of an ordinary pin head in a 28-inch alligator—that they are distinguished with difficulty from the surrounding tissue.

J. B. Looper (7), who first called my attention to them, finds two or three on each side of the neck near, posterior or median to the thymus, sometimes imbedded in it and apparently continuous with it. Kingsley (5) does not mention the parathyroid in the alligator, but he figures the pharyngeal derivatives in a lizard and shows a single, rather large parathyroid lying against the trachea, posterior to the thyroid. Vincent (11) does not mention the parathyroid in the crocodiles. He says:

> The parathyroids and post-branchial bodies are intimately united, paired, and placed anteriorly to the thyroid. Their precise anatomy differs in different groups. . . . . In *Chrysemys picta* the post-branchial body also contains colloid, but the parathyroid and post-branchial body are very considerably confused together in this and some other species.

A section of a parathyroid and its adjacent structures from a 28-inch alligator is shown in plate 2, figure 8, drawn with a camera lucida under a magnification of about 100 diameters. The gland and adjacent structures are surrounded by a fairly compact capsule (*c*) of fibrous connective tissue. The capsule sends into the body of the gland many broad trabeculae (*t*) which are very vascular and break up the gland into numerous lobules or cords of cells. Capillaries (*ca*) generally filled with blood corpuscles, are seen at many places in the trabeculae and among the cells of the gland. To the right of the gland and inclosed in its capsule is seen an elongated, granular mass which may represent a post-branchial body (*pb*).

A portion of the same section, more highly magnified, is shown in figure 9 (pl. 2). Two masses of cells with a broad trabecula (*t*) between them are seen to the left, and to the right of a broad mass of connective tissue (*ct*) is a portion of the so-called post-branchial body (*pb*).

The gland cells (*gc*) are closely and irregularly packed together, and even under an oil immersion objective no cell walls could be made out, and in but few cases could any lines of demarkation between the cells be seen. The nuclei are oval or round and are densely granular. The close arrangement of the nuclei would indicate that the cells are small.

Throughout the trabeculae numerous groups of red blood corpuscles are seen; usually, but not always, the endothelium of the capillaries in which they are contained may be seen. The trabeculae and capsule are made up of a fairly dense mass of fibres (*ct*) among which are scattered small, oval nuclei. The structure which has been called the post-branchial body (*pb*) consists of a mass of cells whose nuclei do not, perhaps, stain so deeply as those of the nearby parathyroid cells and are not so closely set. As in the parathyroid no cell walls can be determined, but the cells are probably somewhat larger than in the former organ.

Numerous blood capillaries (*ca*) are to be seen and also certain bodies (*hc*) that resemble Hassall's corpuscles. The distinctness of these bodies is exaggerated in the figure. No vesicles, with or without colloid, are to be seen in this section.

THYMUS GLAND

The thymus gland is a very inconspicuous organ in the alligator. It is very long and narrow and may easily be overlooked in dissecting a small animal. In an alligator of 85 cm. length it is about 75 mm. long and about 2 to 3 mm. wide, except at its extreme posterior end where it may be somewhat enlarged. It lies against the muscles of the neck, lateral and dorsal to the esophagus, with its enlarged posterior end near the main blood vessels of the heart. It is so closely associated with certain blood vessels of the neck that the latter may be easily removed with the gland in dissection. It has the same general color as the surrounding tissues, which adds to its inconspicuousness.

A part of a transverse section of the gland as seen under a rather low magnification is shown in plate 2, figure 10. The gland is surrounded by a rather thick mass of connective tissue (*c*) almost too diffuse to be called a capsule, which sends in numerous broad trabeculae (*t*) that divide the gland into the characteristic lobules. Numerous blood vessels (*bv*) are seen in the capsule and in the trabeculae.

The gland tissue proper shows but little difference between the outer, cortical region (*Cor*) and the central or medullary region, such as is seen in the higher vertebrates. In both regions, if any distinction between them be made, numerous corpuscles of Hassall (*hc*) may be seen, even under this low magnification. The diameter of the gland is so small that but few lobules are to be seen in any one cross section.

Figure 11 (pl. 2) represents a small portion of the section shown in the previous figure as seen under a magnification of about 400 diameters. The gland is, of course, made up chiefly of the small, darkly-staining lymph cells (*lc*) which vary to some extent in size and shape but are mostly spherical. Their nucleus is densely granular and occupies practically the entire cell. No signs of mitosis, mentioned by Vincent (11), were seen in these cells. The reticulum supporting the lymph cells seems to be made up of small, angular cells (*rc*) with long fibrillar processes, extending between the adjacent cells. Scattered among the lymph cells are numerous capillaries (*ca*) in many of which erythrocytes (*er*) are to be seen, and in some, leucocytes (*lu*).

Irregular lymph sinuses (*ls*) may also be seen, sometimes containing large, finely granular cells. Occasional large cells (*er*) stained strongly with eosin, are apparently merely stray erythrocytes from some adjacent blood vessel.

The Hassall's corpuscles (*hc*) are numerous and varied in size and appearance. A rather large one is shown at the upper left of the figure, a smaller one to the right of this. The larger one is perhaps the more typical. It shows a central group of very small, dark cells, surrounded by a granular mass in which there are a number of elongated or crescentic cells exhibiting a fairly distinct concentric arrangement characteristic of Hassall's concentric corpuscles. Many of these corpuscles are so small that the characteristic structure cannot be made out.

THE SPLEEN

The spleen in the alligator has about the usual appearance and location as is seen in other animals, though perhaps of rather small relative size. For example, in a 40 cm. animal the spleen was an elliptical body, 8 mm. in its long, and 4 mm. in its short diameter.

A low-power sketch through such a spleen, at right angles to its long axis, is shown in plate 2, figure 12. The capsule (*c*) is well developed but varies much in thickness. It consists of a fairly distinct inner and denser layer and a less dense outer layer in which blood vessels are often seen; between these two layers large blood spaces, filled with blood, are often seen.

One of the characteristics of the alligator spleen, at least in the material studied, is the almost complete absence of trabeculae extending from the capsule towards the center of the gland. The only indication of trabeculae is an occasional strand of connective tissue extending a short distance into the pulp and lying almost parallel to the inner surface of the adjacent capsule (fig. 12, *t*).

The main body of the organ is, of course, made up of the splenic pulp (*p*) to be described later, as seen under higher magnification. Under this low magnification the pulp consists of a fairly dense mass of small cells among which are scattered numerous Malphigian corpuscles (*m*) and large numbers of conspicuous yellow masses (*y*).

The Malphigian corpuscles vary much in size in the same spleen and in number in different spleens; the inclosed artery is usually quite distinct. An occasional blood vessel (*bv*) of larger size is seen in the splenic pulp.

When examined under fairly high magnification several kinds of cells are seen to make up the splenic pulp (pl. 2, fig. 13). The most striking objects are the yellow cells noted above. They vary greatly in size from that of one of the regular lymphoid cells to ten times that bulk. Their color is a distinct brownish yellow, so that they stand out in strong contrast in sections stained in haematoxylin and eosin. They are non-granular and exhibit no nuclei, the only visible internal structures being faint, irregular lines that seem to divide the cell into irregular parts (*1*). Some of them seem to have a cell wall, but most of them, on close inspection, give the impression of being merely close agglutinizations of smaller, yellow masses. What these yellow masses are it is difficult to imagine, unless they are agglutinizations of disintegrating erythrocytes, though in this case it would seem that some nuclei should be in evidence unless the nucleus is the first part of the cell to disappear. Similar bodies have been described in the mammalian spleen as "extracellular pigment granules," probably originating from disintegrating erythrocytes.

The most numerous type of cell in the spleen is, of course, the small lymphoid cell (*2*). These cells are usually round or oval in outline, though some are quite irregular; they contain a few granules that take the haematoxylin stain readily, thus giving the distinct blue color to the section as a whole.

Scattered throughout the spleen are numerous erythrocytes (*3*) seen both flat and in profile.

Occasionally a large, polynuclear cell may be seen (*4*) with two or more nuclei, and more often a large, finely-granular cell with no visible nucleus (*5*).

THE HYPOPHYSIS

Owing to the small size of the alligator's brain, in proportion to the size of the animal, the hypophysis is very small and is quite difficult to remove, without injury, from the skull. Its position and size in relation to the brain are shown in the outline figures 14 and 15 (pl. 3).

Back of the optic chiasma the prominent infundibulum (*in*) is seen, projecting caudad and ventrad and connecting, more intimately than is indicated in figures 14 and 15, with the nervous portion (*nl*) of the hypophysis. This nervous portion, to be described later, was doubtless somewhat stretched in dissecting out the brain from which the two figures under discussion were drawn; its normal condition is probably better indicated in the drawing of the sagittal section (fig. 16, pl. 3).

The main mass of the hypophysis is made up of the glandular lobe (*gl*) from which the small middle lobe cannot here be distinguished. It is oval in outline, somewhat depressed, as shown in figure 15, and projects caudad from the nervous region.

A sagittal section through the infundibulum and hypophysis of an alligator is shown in figure 16, the anterior region being, of course, to the left. The infundibulum (*in*) has a deep cavity (V^3) lined with a distinct, darkly-stained ependyma (*ep*) somewhat thicker towards the base of the cavity, that is, to the left.

The nervous portion of the hypophysis (*nl*) is an irregular, lobulated mass continuous caudad with the infundibulum. As seen in this and the following figure its cavity (*ch*) has a complicated outline and is continuous, of course, as is its ependyma (*ep*) with the third ventricle (V^3) and its ependyma. Its capsule (*c*) is seen in figure 17 (pl. 3) to send a long projection into the tissue of the lobe from the ventral side. As mentioned above, this region of the hypophysis is seen, in the sagittal section, to be less elongated than is shown in figures 14 and 15.

The middle part of the hypophysis (*ml*) as is seen in figures 16 and 17, is continuous with the caudad surface of the nervous lobe, and, in fact, more or less surrounds it, especially on the dorsal and ventral sides. It is somewhat broken up into larger and smaller areas and is so closely continuous with the much larger glandular part that the two regions cannot be distinguished from each other in surface views, as has already been noticed. No cleft between the middle and glandular portions is to be seen.

The glandular part of the hypophysis (*gl*), as seen in sagittal section (fig. 16), is a large, darkly-stained mass directly continuous, caudad, with the middle region. It is surrounded by the fairly thick capsule (*c*) already mentioned, in which blood vessels (*bv*) are to be seen. An occasional colloidal cyst may be seen, as at *cy*.

The finer structure of the hypophysis will now be considered. The glandular lobe (pl. 3, fig. 18) is, as has been said, much the largest region of the hypophysis. It consists of indefinite cords or strands of cells, between which are very numerous blood capillaries (*ca*) in most of which blood corpuscles (*bc*) may be seen.

The cells are of two, possibly three types, as judged by their nuclei. The cell boundaries are seen with the greatest difficulty, if at all, in sections stained with haematoxylin and eosin.

The most abundant type of cell (*1*) is spherical or polygonal and is characterized by a very large, usually spherical nucleus, in which are fine granules and often one or two larger granules or nucleoli. The nuclear granules do not stain so darkly as those in the next type of cells. The cytoplasm of these cells sometimes stains very faintly in eosin, but not a deep pink, like the adjacent red blood corpuscles. Possibly they correspond to the oxyphil cells of the human pituitary.

The second type of cell (*2*) is characterized by its small, darkly-staining nucleus. It is not quite so numerous as the former cells. The nuclei are much smaller than those of type *1*, and are pear-shaped or triangular in outline. Owing to their dark staining and characteristic shape they stand out in sharp contrast to the nuclei of type *1*.

Besides these two, a possible third type is shown (*3*) though these cells may be merely a variation of one of the preceding types. The nuclei are of intermediate size and are spherical or oval in shape.

An occasional vesicle with inclosed colloid (*co*) may be seen. The wall of the vesicle seems to be made up chiefly of cells of the smaller sizes, with an occasional cell of type *1*. Around the lobe is a connective tissue capsule (*c*) a part of the meninges of the brain.

A high-power drawing of a small region of the middle lobe and the adjacent nervous lobe is shown in figure 19 (pl. 3). This region differs from the main or glandular lobe in being much less vascular and in being made up almost entirely of only one, or possibly two, kinds of cells. Most of the cells shown in the figure are those containing the very large, round nuclei. These nuclei seem to stain darker than the corresponding nuclei of the glandular region. The cell outlines are more evident, in some cases, than in the glandular region. Only a few of the small, round nuclei are seen and still fewer of the pear-shaped ones that were so much in evidence in the glandular lobe.

A small section of the nervous lobe, through the region *a-b*, figure 17, is shown under fairly high magnification, in figure 20, (pl. 3). To the left is seen the fairly thick capsule (*c*) and to the right the ependyma (*ep*) lining the cavity of this region of the hypophysis and consisting of irregular columnar cells with large, round or oval nuclei. The cell divisions of the ependyma may be seen only at certain places and then with difficulty. The main body of this lobe consists of the structures usually described. A dense mass of fine fibers with widely scattered oval pyriform cells; and an occasional blood capillary (*bv*) are present and occasional groups of cells which, in some cases, are seen to surround an alveolus (*cy*) containing colloid.

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LETTERING FOR ALL FIGURES

a, alveolus
ad, adrenal
ao, aorta

bc, blood corpuscles
bv, blood vessel

c, capsule
ca, capillary
cc, cortical column
ch, cavity of hypophysis
co, colloid
cor, cortex
ct, connective tissue
cy, colloidal cyst

en, endothelium
ep, ependyma
er, erythrocyte

gc, gland cells
gl, glandular lobe of hypophysis

hc, Hassall's corpuscle

i, interstitial tissue
in, infundibulum
is, interspace

lc, lymph cells
ls, lymph sinus
lu, leucocytes

m, Malphigian corpuscles
mc, medullary or chromaphil cells
ml, middle part of hypophysis

nl, nervous part of hypophysis

o, ovary
ov, ovum

p, pulp
pb, post-branchial body
pc, post cava
pt, parathyroid

rc, reticular cells

t, trabeculae
tr, trachea
ty, thyroid gland

V^3, third ventricle

y, yellow cells

EXPLANATION OF PLATES

PLATE 1

Fig. 1. A low-power drawing of a transverse section through the adrenals and adjacent structures of a 40 cm. alligator.

Fig. 2. A medium-power view of part of a transverse section of the adrenal of a 75 cm. alligator, showing the massing of the chromaphil cells, under the capsule.

Fig. 3. A part of a transverse section of the adrenal of a 60 cm. alligator as seen under a magnification of about 500 diameters. The region here shown was about half way between the center and the periphery of the gland.

Fig. 4. A figure to show the shape and position of the thyroid gland in a 40 cm. alligator. About life size.

Fig. 5. A portion of the thyroid and parathyroid glands of the alligator as seen under fairly low magnification.

Fig. 6. A few alveoli of the thyroid gland of the alligator under a magnification of about 400 diameters. In some glands there is more interalveolar connective tissue.

Fig. 7. A section through the parathyroid shown in figure 5, magnified about 400 diameters.

PLATE 2

Fig. 8. A section of the parathyroid and post-branchial body of a 70 cm. alligator under low magnification.

Fig. 9. A portion of the section shown in the preceding figure, drawn under much greater magnification.

Fig. 10. A transverse section of the thymus gland of the alligator as seen under fairly low magnification.

Fig. 11. A small portion of the thymus gland, shown in the preceding figure, magnified about 400 diameters.

Fig. 12. A low-power sketch of a section through the spleen of the alligator, cut at right angles to the long axis of the organ.

Fig. 13. The splenic pulp of the alligator magnified about 500 diameters.

PLATE 3

Fig. 14. An outline sketch of a ventral view of the brain of the alligator to show relative size and position and the hypophysis.

Fig. 15. A lateral view of the brain and hypophysis shown in the preceding figure.

Fig. 16. A low-power, camera sketch of a sagittal section of the infundibulum and hypophysis of the alligator. Anterior end to the left.

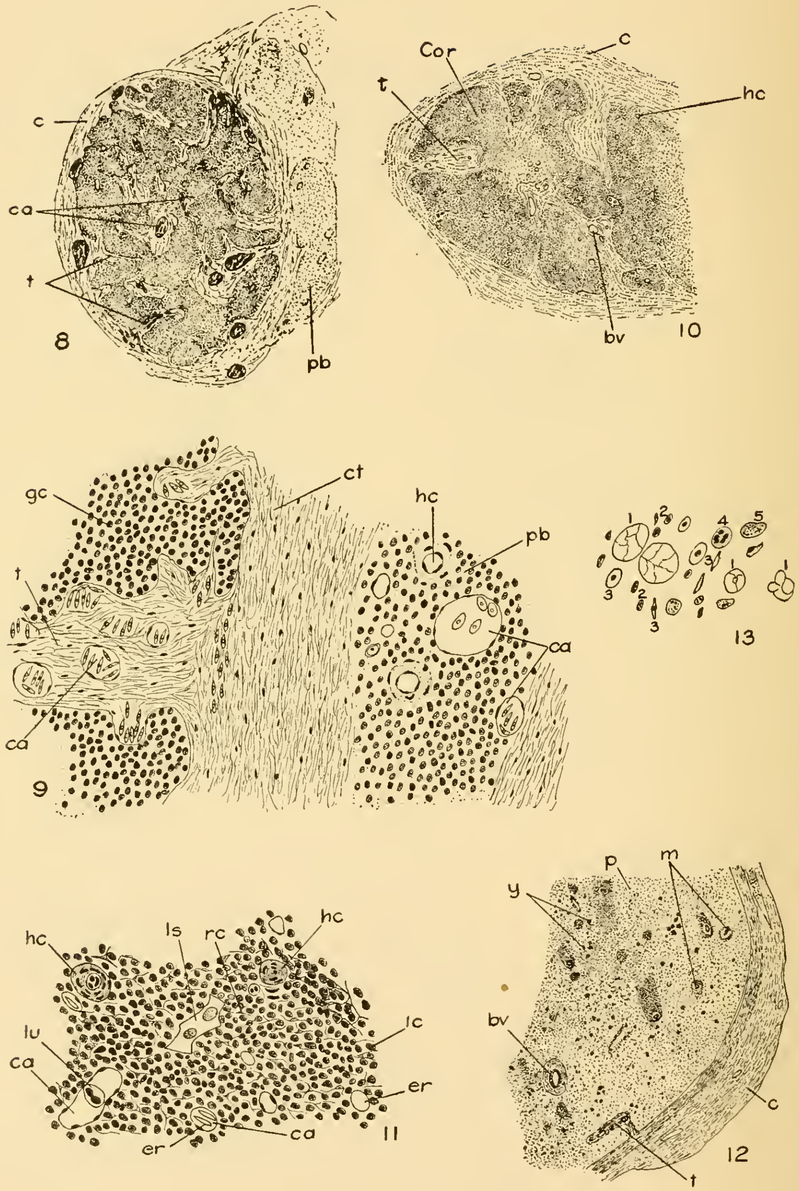
Fig. 17. A low-power, camera drawing of a transverse section through the nervous part of the hypophysis of the alligator.

Fig. 18. A part of the glandular region of the hypophysis of the alligator, under high magnification.

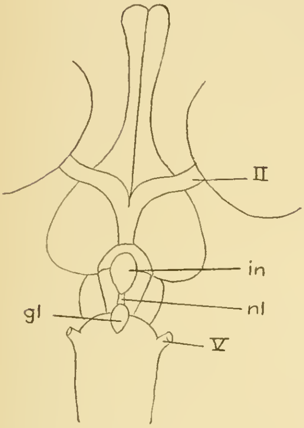
Fig. 19. The middle region of the hypophysis of the alligator, under high magnification.

Fig. 20. The nervous part of the hypophysis of the alligator, under high magnification.

For explanation, see page 14.



For explanation, see page 14.



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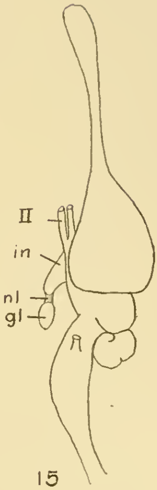

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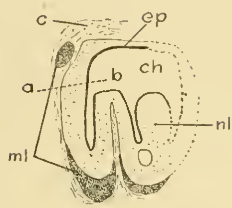
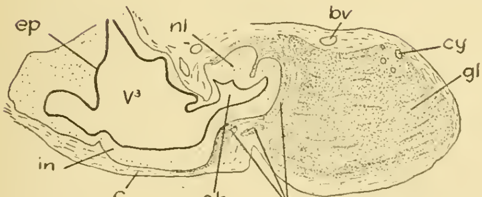
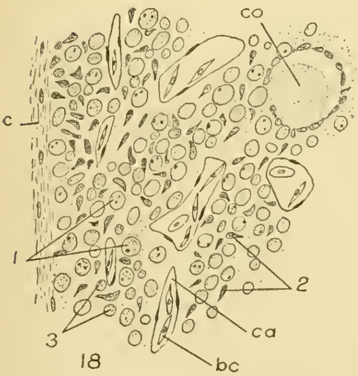


17

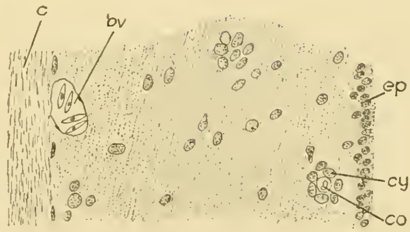
19



16



18



20

For explanation, see page 14.