CHAPTER VI

THE UROGENITAL ORGANS

FIGURE 54 represents the urogenital apparatus of a thirty-inch female specimen of *Alligator mississippiensis*. Figure 55 shows the corresponding organs of a male *A lucius;* reproduced from Bronn.

The urogenital organs in the young animal are so similar in the two sexes that one might easily be mistaken for the other; of course in sexually mature animals, especially during the breeding season, this is not the case.

The *kidneys*, Fig. 54, k, Fig. 55, a, are flattened, lobulated organs lying against the dorsal body wall. The large anterior lobe of each kidney is pointed at its anterior end and lies at some little distance from its fellow; it is partially divided into secondary lobes and is traversed on its ventral surface by branching blood-vessels. Its antero-medial border is sometimes partially concealed, in a ventral view, by the elongated gonad of that side. Caudad to the main lobe of the kidney is a smaller, usually distinct, lobe in contact mesially with its fellow of the opposite side.

A fairly wide *ureter*, Fig. 54, u, Fig. 55, d, extends from the posterior end of each kidney to open (Fig. 54, u^1, Fig. 55, e) into the anterior region of the cloaca, as described in connection with the digestive system.

The *ovary*, Fig. 54, o, as noted above and as seen in Figs. 54 and 55, in the young animal is of practically the same shape as the testis. The ova at this stage are of microscopic size and are hence not visible to the naked eye. The ovary, even at this stage, is more or less distinctly marked off into lobules by a series of small grooves.

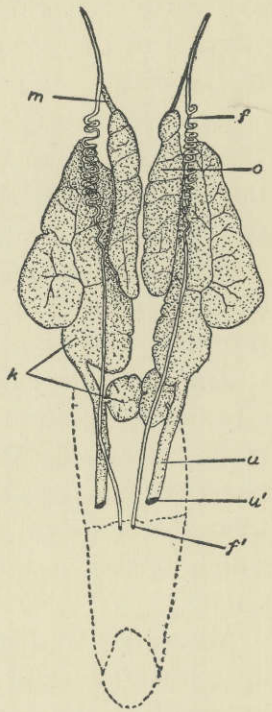

FIG. 54. FEMALE UROGENITAL SYSTEM.

f, oviduct; f^1, opening of oviduct; *k*, kidney; *m*, mesentery; *o*, ovary; *u*, ureter; u^1, opening of ureter.

The *oviduct*, Fig. 54, f, which at this stage is, of course, of small diameter, extends across the ventral surface of its corresponding kidney and opens, f^1, into the posterior part of the cloaca as has already been described. Its peritoneal opening is some distance cephalad to the head of the ovary. Its course from this opening is straight until about the anterior end of the ovary; it then becomes somewhat con-

voluted for a short distance, but gradually straightens out, to pass to its posterior end as a nearly straight duct. The anterior straight portion of the oviduct is connected with the head of the ovary by a narrow band of mesentery.

Each *testis*, Fig. 55, b, like the ovary, lies along the ventro-mesial border of its corresponding kidney and is connected with the posterior region of the cloaca by a slender vas deferens, Fig. 55, c, f.

According to Rathke (in *C. acutus*) a small, slender epididymis lies along the outer side of the posterior half of each testis.

The Copulatory Organs. The *penis*, Fig. 56, usually lies completely hidden in the cloaca; with its glans projecting backwards it is strongly arched; along the convex side of the arch, which is directed towards the upper wall of the cloaca, runs a groove, which serves as a penial urethra to conduct the semen.

According to Rathke there may be recognized in connection with the penis two fibrous strands (resembling the corpora cavernosa of mammals), a corpus cavernosus urethrea, and a covering derived from the mucous membrane of the cloaca. The two fibrous strands arise from the pubis as two thick plates that soon completely fuse together by their adjacent sides to form the shaft, c, of the penis. These fused strands taper gradually towards the glans, in which they end in a point. From their mode of fusion there is left between

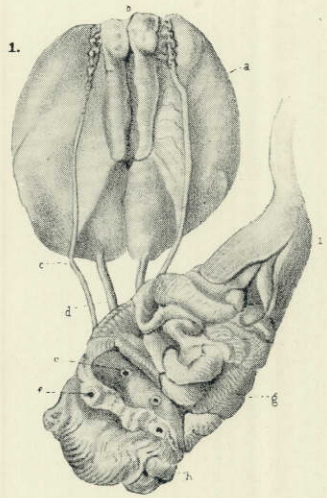

FIG. 55. MALE UROGENITAL APPARATUS OF ALLIGATOR LUCIUS. (After Bronn.)

a, kidney; *b*, testis; *c*, vas deferens; *d*, ureter; *e*, opening of the ureter into the cloaca; *f*, opening of the vas deferens into the cloaca; *g*, upper region of the cloaca; *h*, hinder region of the cloaca; *i*, rectum.

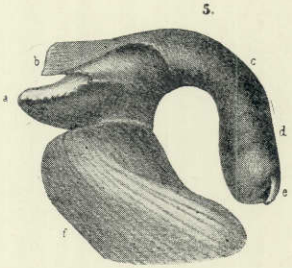

FIG. 56. MALE ORGAN OF ALLIGATOR LUCIUS, XI. (From Bronn, after Rathke.)

a, the right crus penis; *b*, the mucous membrane of the cloaca that covers the organ; *c*, shaft of the penis; *d*, base of glans; *e*, point of glans; *f*, part of the ring muscle of the cloaca.

them, on the side towards the upper wall of the cloaca, a fairly deep furrow that extends to the tip. According to Rathke these shafts are not of cavernous tissue, but the tube is lined by a layer of this tissue.

The *glans*, e, consists of two parts between which, where they leave the shaft of the penis, is a funnel-shaped hole, wider towards the free end of the penis and divided into similar lateral halves by a fold of skin. The glans is much shorter than the shaft of the penis. The covering of the penis is much thinner than the mucous membrane of the cloaca and is thinnest along the groove; it extends from the shaft over the glans without forming a foreskin.

The base of the penis is attached to the pubis near its symphysis. With this base the most anterior part of the strong ring-muscle of the cloaca is closely attached by a fairly large mass of fibrous tissue. Rathke fails to find any muscles that are concerned alone with the copulatory organs.

In the copulation of the crocodile, according to Rathke, the penis is erected, though how this is caused is difficult to say since the corpora cavernosa consist only of fibrous tissue and the cavernous tissue lining the groove is very thin. The penis can, therefore, project only a short distance from the cloaca. The cavernous tissue is capable of causing only a slight elongation of the shaft, but

the glans is considerably elongated by the strong influx of blood into that structure. According to Voeltzkow (78) the penis in the Madagascar crocodile is 20 cm. in length.

The clitoris of the sexually mature female crocodile is very much smaller than the penis of a male of the same size, but, according to Rathke, it varies greatly in size in different species. It is built on exactly the same plan as the penis.

According to Bronn the clitoris as well as the penis projects from the cloaca, out through the anus, in the embryo of the crocodile; this was not observed by the present writer in the embryo of the Florida alligator, *A. mississippiensis*.