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A Simplified Method for Separation of Urine and Feces in the Immature Fowl.*† (31501)

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The urine of the fowl flows from the ureters into the cloaca where it becomes mixed with feces; consequently, the collection of uncontaminated samples of urine or feces presents considerable practical problems. Non-surgical methods such as collecting urine by means of a funnel inserted into the urodeum were employed by Davis(1) and Coulson and Hughes(2), and the cannulation of the ureters has been employed to measure urine flow(3). The catheter (funnel) and cannula techniques facilitate only the collection of urine and, at best, for only limited periods (usually one-half to 24 hours). Exteriorization of the ureteral openings has been described by Hart and Essex(4) and more recently by Ainsworth(5). The latter method requires several incisions and sutures and usually requires that the bird wear a harness to facilitate urine and/or feces collection. A method has also been described for constructing an artificial anus(4), but the authors reported that birds remained suitable for experimental purposes for only 2 or 3 weeks. The method described here does not suffer from many of these disadvantages.

Anesthesia. White-Leghorn cockerels of approximately 9 weeks of age were selected and fasted 8 hours to insure that all feces were voided from the lower portion of the gut. The birds were given a general anesthetic by administering 20 mg/kg body weight of pentobarbital sodium, (Abbott Laboratories, North

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Chicago, Ill.). Anesthetic was administered intravenously (wing vein) and very slowly until the birds showed virtually no response to pinching the comb. Anesthesia accomplished in this way lasted about 45 minutes to one hour which was sufficient time to complete the operation.

Surgical Techniques. When anesthesia was complete, feathers were removed from an area about 60 cm^2 in the vicinity of the cloacal orifice, and the area swabbed lightly with alcohol. An incision approximately 1 cm long was then made perpendicular to the midline and approximately 1 cm anterior to the anal orifice. The distal portion of the rectum was brought to the surface of the

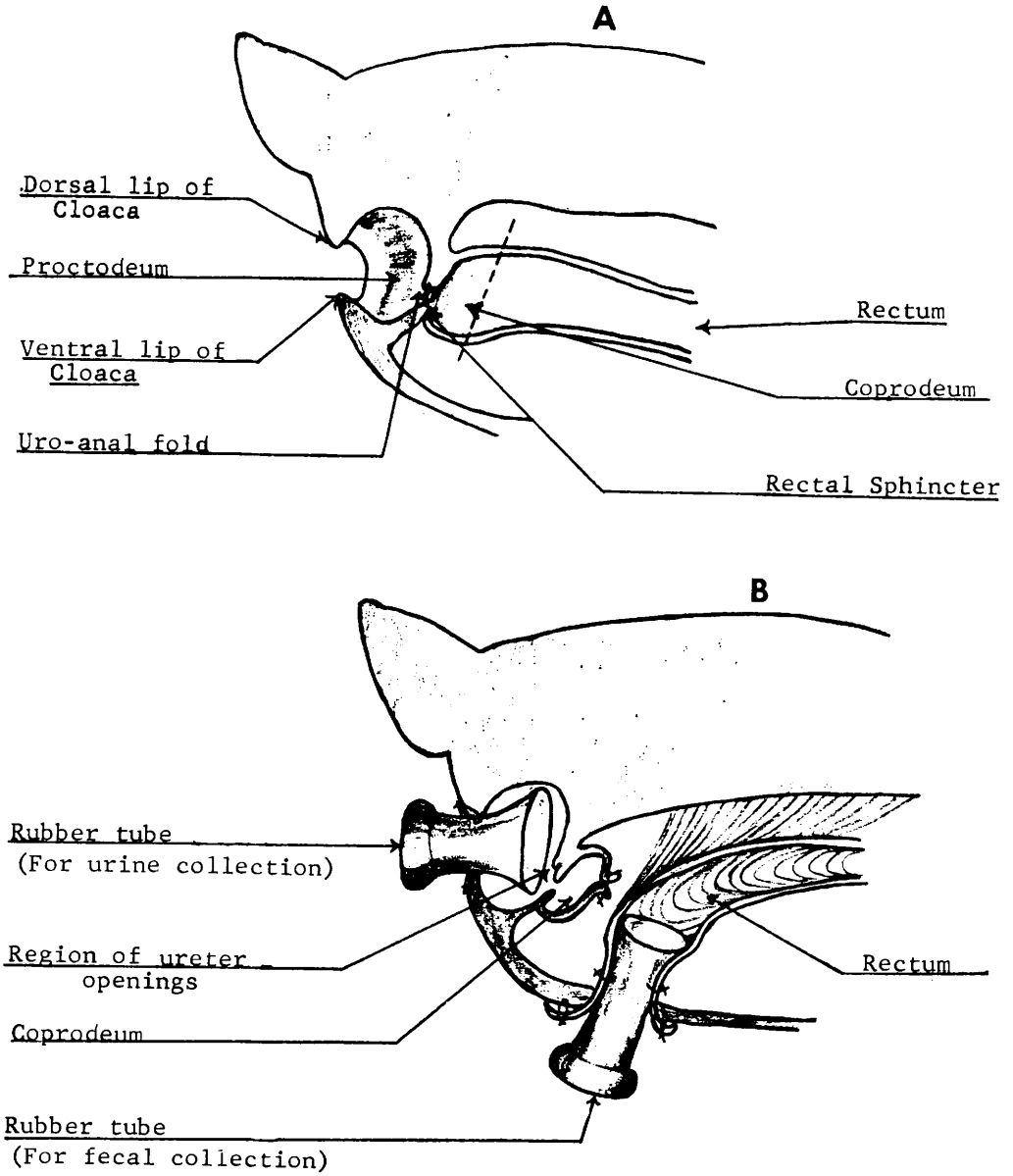

FIG. 1A—Longitudinal section through the medial posterior portion of normal intact bird.
FIG. 1B—Longitudinal section through the medial posterior portion of bird with a reconstructed artificial anus and with tubes in place for urine and feces collection.

incision and the cloaca was closed by means of a silk suture as near the rectal sphincter as possible as shown by the dotted line in Fig. 1A. The rectum was then severed just proximal to the suture. At this point a few mg of powdered sulfathiazole was dusted into the body cavity through the incision.

A sterile, pliable, rubber medicine-dropper bulb with a rolled end was cut to a length of approximately 2.5 cm and the cut end inserted into the rectum 1.5 cm (Fig. 1B). The tube was then sutured to the rectum, near the end of the inserted end, by 6 sutures. The mucosa was then attached to the surface of the skin immediately around the incision by silk sutures and dusted with sulfathiazole.

A tube as described above was inserted into the cloaca approximately 0.75 cm so as not to block the ureteral openings (Fig. 1B). The tube was then attached to the dorsal and ventral lips of the cloaca by 6 silk sutures.

Collection of Urine and Feces. To collect samples of either urine or feces or both, toy balloons of a suitable size were tied with nylon string around the rolled end of the rubber bulbs which protruded from the cloacal orifice and the artificial anus.

Discussion. Birds treated surgically in this way require virtually no post operative attention. They can move about freely in about one to two hours and may be given feed and water immediately. The authors found it desirable to wait about 3 days before placing the birds on experimental treatments in order that the diuresis observed by Hester *et al*(3) and Hart and Essex(4) would be overcome, and to insure that the sutures would hold the tubes securely in place. It is usually necessary to wash the excretion tubes with water before attaching the collection balloons to remove any urates which may collect around the tubes. In about 10% of the birds in which an artifical anus was constructed, recurring blockage of the tubes was noted, and in cases where this occurred the birds were discarded. There was no mortality related to the operation itself, and experimental periods could continue indefinitely.

By using extruded tubes the collection balloons can be attached and removed easily without the inconvenience of a harness on the bird, and contamination of the feces by the urine is prevented.

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Autoimmunity in Relation to Aging as Measured by Agar Plaque Technique.* (31502)

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Although alloantibody (isoantibody) titers in man tend to decline with age, striking increases in the incidence of various autoantibodies in supposedly healthy older humans are encountered(1). Not much is known in this regard with respect to old non-human populations. The present study was directed toward the possible detection of autoimmune phenomena in "normal" old mice of a strain combination in which clinically apparent hemolytic anemia and lymphomatous disease have a negligible incidence. If autoimmune phenomena contribute to chronic, perhaps subclinical, deleterious changes associated with aging(1), increased numbers of lymphoid

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