

Table 2. APPEARANCE OF RADIOACTIVE PHOSPHORUS IN THE DEOXYRIBONUCLEIC ACID (DNA) OF EJACULATED SPERMATOZOA AFTER INTRAMUSCULAR INJECTION OF LABELLED INORGANIC PHOSPHATE TO BULLS

Bull (No.)	Age (months)	Date of phosphorus-32 injection	Dose of phosphorus-32 ( $\mu\text{c./kgm.}$ )	No. of ejaculates		Number of sperm ejaculated $\times 10^9$			Time interval (days) from injection to:	
				During days 0-30	From the thirtieth day onwards and until the appearance of labelled DNA	From injection to the appearance of labelled DNA	During days 0-30	From the thirtieth day onwards and until the appearance of labelled DNA	First appearance of phosphorus-32 in DNA	Labelling of DNA reaching the maximum (average)
18	30	May 1, 1957	11	22	14	104.4	65.9	38.5	48	60
18	36	Nov. 20, 1957	20	1	3	38.6	15.1	23.5	50	69
18	42	May 1, 1958	12	49	37	186.7	132.9	53.7	48	52
F	12	May 17, 1958	5	22	—	39.5	24.4	15.2	48	—
F	18	Nov. 5, 1958	8	71	50	122.9	77.8	45.1	47	55
F	21	Jan. 20, 1959	7	79	5	93.0	60.1	32.9	50	66
Ph	30	Nov. 5, 1958	8	5	6	79.9	29.7	50.2	51	63
Ph	33	Jan. 20, 1959	10	5	67	244.5	76.7	167.7	40	53

values). Table 2 includes also results for the number of ejaculates obtained during definite periods of time and the number of spermatozoa ejaculated during the same periods. The general conclusion which can be drawn from these results is that the period of time required for the appearance in ejaculates of spermatozoa with labelled deoxyribonucleic acid is remarkably constant irrespective of the frequencies of ejaculations. The average age of ejaculated spermatozoa, however, varies according to the frequency of collections; thus, infrequent collections will result in a higher average age of the spermatozoa in ejaculated semen, indicating that the sperm have been stored in the cauda epididymidis for a longer period of time than in the case of frequent ejaculations.

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### Abnormalities in the Urinogenital System of the Common Dogfish

ABNORMALITIES of the urinogenital system of the common dogfish (*Scyliorhinus caniculus*) have hitherto been regarded as infrequent<sup>1-3</sup>. It is therefore of interest to note that in the past academic year three abnormal dogfish have been found by this department.

*Case 1.* This dogfish was 14.3 in. long (36.3 cm.) from the tip of the snout to the posterior end of the first dorsal fin. The external appearance was that of a young male. The right clasper was 3.5 cm. long, and the left clasper 2.9 cm. long. The united mesial border of the pelvic fins<sup>4</sup> was notched to a depth of 9 mm. So far as can be judged, the structure of the siphon was normal. The appearance of the mouth<sup>2</sup> was typically male.

Internally the urinogenital ducts were symmetrical and hermaphrodite. Superficially, the urinary and Wolffian ducts presented the normal appearance of a young male, and the seminal vesicles were dilated to a diameter of 7 mm. There was, however, no sperm sac. The main urinary duct on each side opened into the urinary papilla, but the seminal vesicles opened into the dorsal wall of the base of each oviduct.

On each side the Müllerian duct extended from the common oviducal aperture to the cloaca. The length of the common oviducal aperture was 9 mm. There was no indication of an oviducal gland. Throughout

the major part of its length the diameter of the Müllerian duct was 2.5 mm., and the lumen was filled with a clear mucus. The posterior part of the Müllerian duct had an average diameter of 5 mm., so this part was apparently dilating, as would be expected in a young female prior to copulation. The right Müllerian duct was closed at the cloaca, and sealed to the lateral side of the urinary papilla. The equivalent region of the left side was damaged by student dissection, but is believed to have been in the same condition originally.

The left gonad had the external appearance of a functional testis. Microscopical examination revealed that proliferation of spermatogonia was occurring in the seminiferous tubules, but that maturation of spermatozoa was not occurring. The right gonad was less well developed, and had the appearance of an immature ovary. Oocytes as big as 2 mm. in diameter were visible in one part.

*Case 2.* The dorsal fin had been removed with the tail, but the animal was 13 in. long (33 cm.) from the tip of the snout to the posterior end of the pelvic fin. In other words the animal was slightly longer than case 1. The external appearance was not so typically male. The left clasper only was present, and was only 2 cm. long. The pelvic fins were completely separated posteriorly as in a typical female. There was no indication of a siphon having been present.

Internally, as in case 1, the urinogenital ducts were bilaterally hermaphrodite, and the sperm sac was absent. Again the urinary ducts presented a typical male appearance; but in this case they opened into the dorsal wall of the oviduct, and no urinary papilla was present. The seminal vesicles were indicated, but were only 3 mm. in diameter. As in case 1 they opened into the dorsal wall of the base of the oviduct. The Müllerian ducts extended the whole length of the body cavity, with an average diameter of 2 mm., and dilating in the oviducal gland region to 6 mm.

The left gonad had the external appearance of an abnormally short testis. The right gonad had the appearance of an immature ovary.

*Case 3.* A new pectoral steak was found to contain both vasa deferentia and an immature ovary with oocytes. The rest of the animal was not located.

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