mately 20 mg. No radioactivity could be detected in the inoculum at the time that the oranges were inoculated. The delayed action of the fungi in infecting the fruits therefore appeared to be the result of previous exposure to P^{32} rather than to any actual radioactivity conveyed to the fruits in the inoculum. The very low activity of the original solutions suggests the possibility that greater dosages might be employed without too great an increase in health hazards.

It would be interesting to observe the effects of radioactive phosphorus on the subsequent decay of oranges, if the phosphorus were applied in the grove either as a spray or as a fertilizer. Although fungicidal sprays are employed in the groves, in commercial practice the most concerted efforts to control decay are made in the packing houses. However, control of stem-end decay of citrus fruits is made much more difficult because the two causal organisms become established in the stem tissues, and few fungicides will penetrate these tissues without injuring the fruits.

Progesterone in Blood Plasma of Cocks and Nonovulating Hens[1]

Richard M. Fraps
Bureau of Animal Industry, USDA, Beltsville, Maryland

Charles W. Hooker[2] and Thomas R. Forbes
Department of Anatomy, Yale University

Tests utilizing the method of Hooker and Forbes (*4*) have indicated the occurrence of progesterone in blood plasma of the regularly ovulating hens at least during certain phases of the ovulatory cycle (*3*). In extending these original observations, we thought it desirable to test raw plasma samples from males, and also from reproductively quiescent hens, as controls against possibly untoward reactions of the mouse endometrium to presumably progesterone-free plasma of avian origin. Preliminary tests unexpectedly yielded positive, and altogether typical, progesterone reactions. Additional assays confirmed these findings—the first direct evidence, so far as we are aware, of progesterone in the blood stream of normal males of any species.

The sex, breed, and age of the seven fowl furnishing plasma samples are recorded in Table 1, together with assay findings. Undiluted plasma (0.33 μg/ml) from the New Hampshire male did not give a positive reaction, possibly because of uterine distension or loss of material from the ligated segment. The questionable result from one of the females at the 1.0 μg/ml level may be accounted for similarly. All other findings are consistent among themselves; plasma from the two capons was completely negative at all levels tested.

The maximal levels of progesterone recorded in Table 1 are relatively high, ca. 3 μg/ml plasma, or about half the concentration most frequently encountered by Forbes and Hooker (*2*) and Hooker and Forbes (*5*) in mammals with active corpora lutea. The surmise that progesterone at these concentrations exercises some specific, if presently unknown, function seems reasonable.

TABLE 1

RESULTS OF ASSAYS FOR PROGESTERONE IN PLASMA FROM MALE, NONLAYING FEMALE, AND CASTRATED FOWL

Source of plasma			Progesterone, μg/ml*			
Sex	Breed†	Age	0.33	1.0	3.0	5.0
Male	W.L.	15 months	+	+	n.t.	n.t.
"	W.L.	16 "	+	+	+	−
"	N.H.	18 "	−	+	+	−
Female	W.L.	16 "	+	+	n.t.	n.t.
"	W.L.	16 "	+	±	+	±
Capon‡	N.H.	7 "	−	−	−	−
"	N.H.	ca. 4 years	−	−	−	−

* Plus and minus signs indicate presence and absence respectively of progesterone at indicated assay levels; n.t. no test at this level.

† Breeds: W.L., White Leghorn; N.H., New Hampshire.

‡ Castrated at 6 weeks of age. We are indebted to the Poultry Department, University of Maryland, for placing these capons at our disposal.

We cannot exclude the possibility that the substance in avian blood eliciting in the mammal the same reaction as progesterone may in fact not be progesterone. However, two of us (*6*) have recently completed tests of some 25 substances believed most likely to duplicate the action of progesterone; none of them did so in our tests. It is of especial relevance that testosterone and desoxycorticosterone acetate did not reproduce the effects of progesterone by the mouse assay (*4*).

Progesterone has been isolated from the adrenal glands of oxen (*1*), and pregnanediol concentrations in the urine of bulls are reported to exceed those normally found in the urine of pregnant cows, mares, or women (*7*). These and numerous other observations of an indirect nature have suggested that progesterone is not necessarily limited in occurrence to the female. The actual finding of progesterone in the blood stream of male fowl substantiates these views.

More extended investigations of avian and mammalian plasma from males, nonpregnant females, and castrates are currently in progress.

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[2] Present address: Department of Anatomy, Emory University School of Medicine, Emory University, Georgia.

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