achieved with another 6 tumors grown in chickens from 5 to 8 months old.

The signs of adaptation of the chicken tumor to ducks are quite obvious: progressive growth often followed by generalization in ducks of all ages, acquisition of new tissue affinities, total or partial loss of the power to induce tumors in adult chickens, and gross and microscopic changes in the tumors (*3*). Proper analysis revealed that no two of the variants are identical, each differing from the rest in degree of generalization, incidence of non-neoplastic (hemorrhagic) or neoplastic lesions, cell type and texture of the growths, and virulence and tissue affinities of the virus inductor. In regard to the last property special mention must be made of a neurotropic strain of sarcoma which induces in the central nervous system of young ducks a typical hemorrhagic disease, while the nervous tissue of older ducks is never affected by either hemorrhagic or neoplastic lesions. Also, some of the lines have been transmitted to full-grown pigeons, in several passages, by means of cell suspensions and filtrates. Large primary tumors followed by widespread generalization have often been obtained.

The above results have to be related to the diminishing susceptibility of aging birds to tumor viruses, which finds an expression in the progressive development of a suppressing power by the blood serum against these viruses (*1, 7*). When chickens ranging in age from embryos to 2 years are infected with the virus of the Rous sarcoma, the following lesions are observed to develop: (a) a non-neoplastic, hemorrhagic disease (*2*); (b) fast-growing tumors, first combined with, and later free of, hemorrhagic lesions (*1*); (c) moderately-growing tumors (*1*); and (d) slow-growing tumors which frequently regressed (*6*). Free virus can easily be demonstrated in filtrates from hemorrhagic lesions and fast-growing tumors, whereas it is only occasionally shown in filtrates from tumors grown in old chickens (*6*). Also, study of a series of 14 spontaneous chicken sarcomata suggests that these neoplasms cannot be transplanted if they arose in old chickens (*5*).

Therefore, chicken tumor viruses infecting a progressively older individual shift from a highly favorable to a highly unfavorable medium. The present experiments suggest that adaptation to a foreign species, the duck, takes place most easily between these two extremes when presumably conditions in the medium become adverse but without reaching as yet that phase in most old animals where the effect on the virus may go as far as complete suppression and causing the tumor to regress. The process may be compared to variation in bacteria in old cultures or in convalescents. It is not that the tumor virus varies as a consequence of the infection of the duck, but rather that ducks are infected by an easily adaptable virus because that virus has previously varied in the chicken.

Finally, the fact that the tumor virus from chicks failed to vary in ducks, despite successful growth in the latter host for several passages is in itself the ideal control, proving that the lines of duck tumors were evolved by variation of the chicken virus and not by activation of hypothetical dormant duck viruses.

SUMMARY

The age of the chicken in which the Rous sarcoma is grown has an influence on the variation and subsequent adaptation of the causative virus to ducks. Adaptation is relatively easy to accomplish when the tumor has been grown in adult chickens several months of age. It has never been accomplished when the tumor has been grown in chicks and only occasionally when it has been grown in old chickens.

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The Effects of Sex Hormones on the Copulatory Behavior of Senile White Rats[1]

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There is a large body of literature covering the experimental work on various aspects of sex activity. However, most of the behavioral studies are limited to the period of growth and early maturity. This is especially true of such studies as those dealing with the influence of the estrogens and androgens.

The present investigation is concerned with the effects of hormonal action on animals of relatively advanced age. Twenty-five male white rats, 28 months old, were used. The rats were very large, the average weight being 342.0 grams. They were derived from four litters and were divided into groups according to

[1] Thanks are due to the Schering Corporation for supplying 380 mg. of oreton (testosterone propionate) and 450 Cartland Nelson units of anteron (pituitary-like hormone from pregnant mares' serum). Thanks are also due to Parke Davis and Company for supplying 100,000 I.U. of the estrogen compound, theelin.

the split-litter technique. The 25 animals were arranged into three groups, as indicated in Table 1. A well-balanced diet was supplied, consisting of Purina products (Growena mash, Dog Chow pellets) and a plentiful supply of fresh lettuce. Each animal in the testosterone group was given daily subcutaneous injections of 1.25 mg. of the hormone in sesame oil for a period of 15 days. Each animal of the anteron group was give 5 Cartland Nelson units in tricresol solution every third day for a like period, or 25 units in all. The animals in the control group were given either sesame oil or tricresol solution, in amounts equal to the dosage allotted to the two experimental groups. Since the nature of the control injection had no effect on copulatory behavior, the control group will be considered as a unit.

TABLE 1

COPULATION SCORES FOR THE THREE GROUPS, ON THE 8TH AND 15TH DAYS

Control Group			Testosterone Group			Anteron Group		
Rat No.	8th day	15th day	Rat No.	8th day	15th day	Rat No.	8th day	15th day
1	0	7	9	14	21	17	18	17
2	0	0	10	11	17	18	13	17
3	0	0	11	11	15	19	10	18
4	0	0	12	9	17	20	8	13
5	0	0	13	4	15	21	6	7
6	0	0	14	0	14	22	4	11
7	2	0	15	0	0	23	4	7
8	3	0	16	0	0	24	0	0
						25	0	0
Av.	0.625	0.875		6.125	11.625		7.00	10.00

In the copulatory tests, each rat was exposed individually to a female in heat for a period of 10 minutes. These tests were conducted between 11:00 P.M. and 2:00 A.M., with low illumination, to ensure maximum activity. Females, as incentive animals, were kept continually in heat by giving them daily subcutaneous injections of 666 I.U. of estrogen compound (theelin). A strict criterion of copulatory activity was employed. This required that the usual pattern of rapid lumbosacral anterior-posterior oscillations, followed by licking of the penis, occur in each instance.

The main results for both copulation tests are shown in Table 1. As will be seen, only three animals of the control group exhibited copulatory behavior, and each of these only on one or another of the tests. The two experimental groups gave a fairly high average copulation score, although two of the animals of each group did not copulate at all. The difference between each of the two experimental groups and the control group is statistically significant, whereas the difference between the two experimental groups is not.

It is clear from these results that rather large doses of testosterone propionate are no more effective than the pituitary-like hormone as here employed. In the case of the latter, we must assume that the hormone operated as an activator on the interstitial cells of the testes. This interpretation seems necessary, in spite of the fact that anteron is regarded as primarily an activator for spermatogenic functions. This view is also supported by the histological findings that the interstitial cells of this group showed hypertrophy and hyperplasia in most cases. The testosterone group, on the other hand, showed some degree of atrophy at the various stages of spermatogenesis as well as atrophy of the interstitial cells with replacement fibrosis. These results would seem to raise a question as to the advisability of using testosterone propionate in replacement therapy, as is common in clinical practice. A more detailed account of this experiment may be found in another connection (*1*).

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Scanning Science—

Near the beginning of last year, a discovery was made that excited great interest throughout the scientific world, when it was announced that remains of a veritable missing link between man and the higher apes had been found in Java, in strata of Pleistocene age. The discovery was made by Dr. Eugene Dubois, a surgeon in the Dutch army, who had been stationed in Java for several years and had devoted much time to the vertebrate fossils of that island. . . .

The facts relating to the discovery itself and the position in which the remains were found, as stated by Dubois in his paper, together with some additional details given to me personally, convinced me that, in all probability, the various remains attributed to *Pithecanthropus* pertained to one individual. Under the circumstances, no paleontologist who has had experience in collecting vertebrate fossils would hesitate to place them together. . . .

The tooth, skull and femur, were found at different times in the same horizon, all imbedded in the same volcanic tufa. The tooth was found first, in September, 1891, about a meter below the water level during the dry season, and 12 or 15 meters below the plain in which the river had cut its bed. A month later, the skull was discovered, only a meter distant from the place where the tooth lay. In August, 1892, the femur also was found, about 15 meters distant from the locality where the other specimens were imbedded. Later, in October of the same year, a second molar was obtained at a distance of not more than three meters from where the skull-cap was found, and in the direction of the place where the femur was dug out. . . .—O. C. Marsh

—29 May 1896