increased in any one type of tumor nor in the tumors of any one strain of mice. Most of the cancerous growths had some mitotic figures with an increased number and some with the normal number of chromosomes.

In all of the cultures it was clearly evident that the chromosomes became split longitudinally early in the division of the malignant cells so that in the late prophase and in the metaphase they appeared as a pair of chromosomes rather than as single ones. This phenomenon took place in the carcinoma cells that exhibited an increased number of chromosomes as well as in those that had the normal number.

ON THE EARLY DEVELOPMENT OF THE MOUSE EGG

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An analysis of the material obtained by W. H. Lewis and E. S. Wright in Baltimore on the early development of the mouse egg was partially completed at Mount Desert Island Biological Laboratory. Nine hundred and one eggs were recovered; 819 were from mice that had copulated and 82 were from non-copulators or from mice without males. Of the 819 eggs recovered after copulation, 641 were normal fertile eggs, 14 probably normal ones were injured, 26 were unfertilized, 7 were distorted but probably fertilized, 58 were fragmented non-fertilized, 29 were immatures, viz. without the first polar body and with the vitellus in contact with the zona, 16 were small opaque browns, 11 were zonas only, the vitellus having entirely disappeared, 12 were unclassified abnormals and 5 were degenerate. Of the 82 eggs from non-copulators and mice without males, 60 were normal unfertilized eggs, 4 probably normal one were injured, 8 were immatures, 5 were fragmented and 5 were degenerate.

Our observations indicate that mating may occur at any time during oestrum which lasts from 1 to 3 days. Sperm were found in the upper end of the tube 15 minutes after copulation. Ovulation may occur during early, mid or late oestrum. Animals killed ¼ to 1½ hours after copulation (in early, mid or late oestrum) had freshly ovulated eggs, hence we conclude that there is probably a definite relation between copulation and ovulation.

The first polar body is given off about the time of ovulation and usually degenrates. The second polar body is not given off until after fertilization and may persist to the blastocyst stage.

The first cleavage into two cells occurs at 24 to 27 hours after copulation or ovulation. About 12 hours later the next cleavage into four cells occurs. Between 50 and 60 hours after copulation most of the eggs have arrived at the 8-cell stage. At 72 hours all the eggs are in the morula stage or beginning blastocyst stage. Some of the morulae are complete and have 32 cells, others have 16 to 32 cells. Cleavage is dichotomous.

The eggs pass rather rapidly to the second loop of the tube and remain there in the one-cell stage for about 24 hours. About 12

hours later most of the two-cell stages are in the 2nd, 3rd and 4th loops. At 48 hours after copulation most eggs are still in the 4-cell stage and have reached the 5th or 6th loop of the tube. The eggs remain in the 6th or last loop of the tube for about 24 hours until they attain the late morula or beginning blastocyst stage and then pass into the uterus about 70-72 hours after copulation. Individual eggs frequently vary as regards stage and location. Abnormal eggs pass along the tube and into the uterus at the same rate as normal ones.

The vitelli of the ripe ovarian eggs freed from the ovary averaged about 78.4 microns in diameter or 254,000 cu. microns. In such eggs the vitellus completely fills the zona which has an outside diameter of 95 microns. During the one-cell stage the vitellus shrinks to about 71.6 microns or 192,000 cubic microns or 24 per cent in volume. The inner volume of the zona increases about 50 per cent. During cleavage the vitellus decreases somewhat in size and does not increase until fluid is secreted into the blastocyst cavity.

DIURESIS IN MARINE TELEOSTS

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Grafflin (1931) observed that the sculpin and toadfish may be obtained with urinary chloride concentrations of zero to trace and urine flows below 4 cc. per kilogram per day, and that the chloride concentration of the urine and the urinary flow increased when the fish were kept in captivity under ordinary conditions. Various analyses of fish urine in the literature show high urinary chlorides accompanying high urine flows. We accordingly set out to determine the composition of urine obtained from the bladder of normal fish immediately after being caught, and to follow the changes which occur during experimental manipulation. Analysis of urine was made for chloride, phosphate, sulfate, magnesium, and creatine.

Confirming and extending the work of Grafflin, it was found that the bladder urine collected immediately following catching was free from chloride in 7 of 11 sculpins, *Myoxocephalus octodecimspinosus;* 1 of 4 daddy sculpins, *M. scorpius;* 5 of 7 grey sole, *Glyptocephalus cynoglossus;* 5 of 5 silver hake, *Merluccius bilinearis;* 1 of 2 hake, *Urophysis tenuis;* and very low in 2 of 3 goosefish, *Lophius americanus.* The other constituents of the urine were quite variable, the phosphates and creatines tending to be somewhat higher than those previously reported.

Using sculpins and daddy sculpins for successive determinations of urine flow and urine composition during experimental manipulation, it was found, as stated by Grafflin, that the urine flow and the chloride concentration of the urine increased progressively in captivity. The phosphate concentration of the urine and rate of excretion, though subject to some early variability, both decreased with time. The total excretion of magnesium and sulfate increased though