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COMPARISON OF WEIGHT AND LENGTH WITH AGE IN HAMSTER EMBRYOS[1, 2]

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The purpose of this study is to determine the relationships between the weight and length of hamster embryos and fetuses of varying ages. Since much experimental work is being done on the hamster during its prenatal and early postnatal life, it seems important to study its external form with its increase in size during late gestation. Purdy and Hillemann (1950) and Boyer (1953) have given descriptions of fetal development in the hamster.

Uteri were removed from pregnant females at varied intervals between 7 days, 12 hours to 15 days, following the time of observed copulation. After fixation in Bouin's solution, individual loculi were placed in vials of 70 percent alcohol. Weights and measurements of 89 embryos and fetuses were taken after removal of all fetal membranes. After measurement, the small embryos were allowed to dry about 5 minutes before weighing, and the larger fetuses were allowed to dry for 10 to 15 minutes. Weights were taken on an analytical balance.

Embryos in the period from 7 days, 12 hours to 14 days show only slight increase in weight and length as compared to a marked increase from 14 through 15 days (figs. 1, 2). There is no significant change in weight from 7 days, 12 hours to 9 days, 16 hours. From 9 days, 16 hours the fetuses show a progressive increase in weight. The lengths of the fetuses vary more than do the weights up to 9 days, 16 hours. This variance is due to the flexions and torsions of the fetuses between 7 days, 12 hours and 9 days, 16 hours. Embryos of 8 days; 8 days, 16 hours; 9 days, 4 hours; and 10 days, 12 hours show an increase in body size and prominent changes in external form at the respective ages (figs. 3, 4, 5, 6).

From 9 days, 16 hours through 15 days, the fetuses show a progressive increase in length and weight. The apparent decrease in length at 9 days and at 10 days may be accounted for by the thoracic and lumbar flexures which occur at 9 days, and the cervical and cranial flexures at 10 days (figs. 5, 6). After 10 days the bodies of the fetuses straighten. There is a rapid increase in body size and weight during the latter part of the gestation period (figs. 7, 8, 9, 10).

Summary

1. Weights and measurements of 89 hamster embryos were taken at varied time intervals.

2. The youngest embryos studied were 7 days, 12 hours old and the oldest were 15 days.

3. Increase in weight and length was slight from 7 days, 12 hours to

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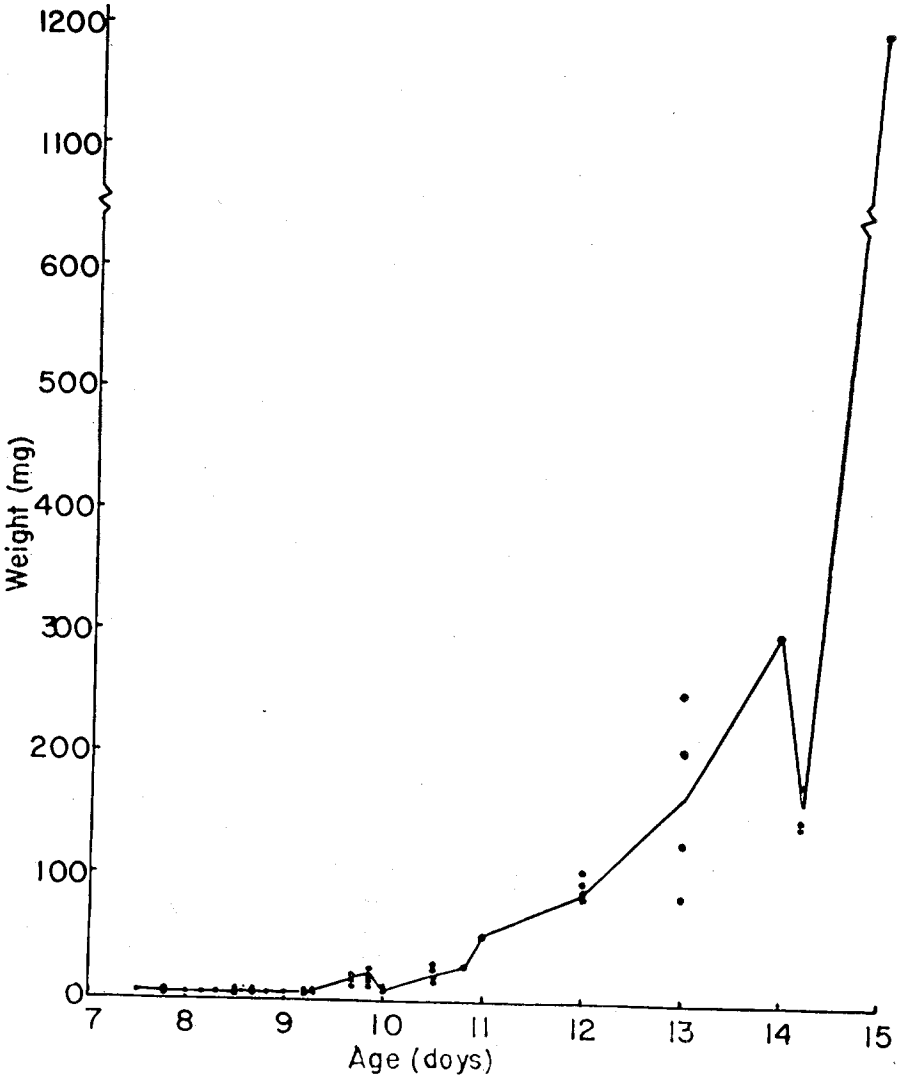

FIG. 1.—Age and crown-rump length of hamster embryos from 7 days, 12 hours through 15 days.

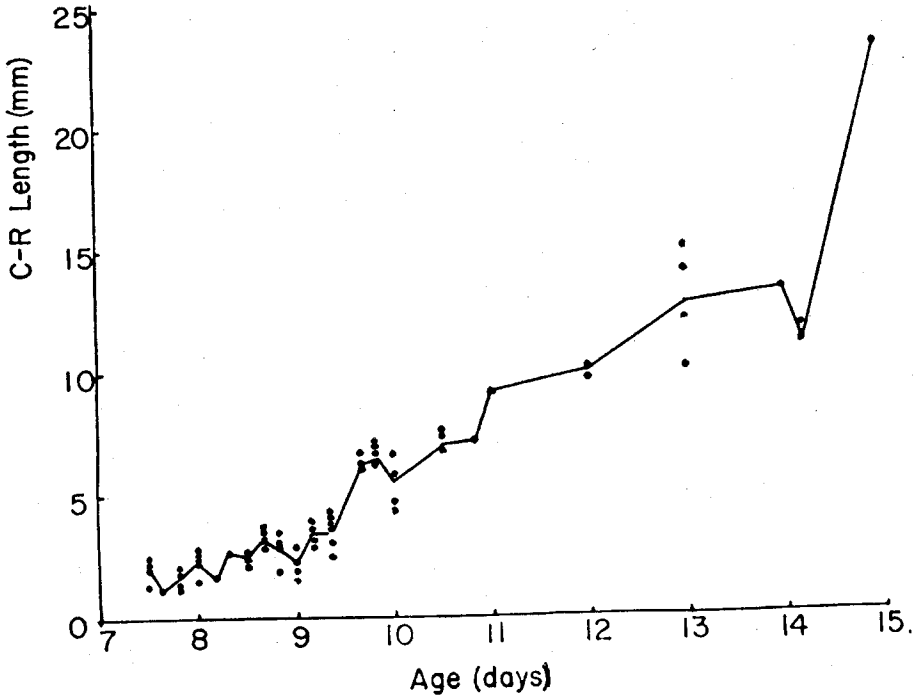

FIG. 2.—Age and weight of hamster embryos from 7 days, 12 hours through 15 days.

14 days, but there was a sharp increase between 14 and 15 days.

4. Lengths vary more than do weights because of flexions and torsions occuring between 7 days, 12 hours and 9 days, 16 hours.

LITERATURE CITED

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PURDY, D. M., and H. H. HILLEMANN, 1950, Prenatal growth in the golden hamster: Anat. Rec. 106: 591-597.

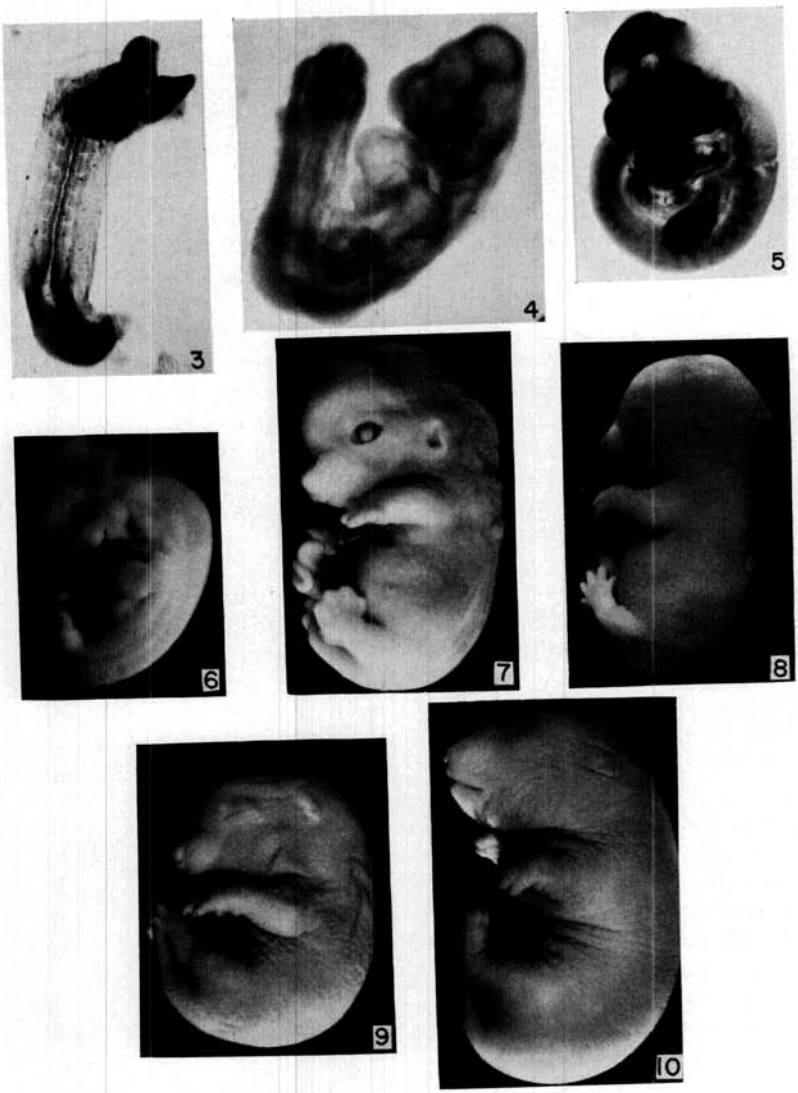

FIG. 3.—Embryo of 8 days of age. 8-9 somites. Head-tail length, 2.5 mm.; weight, 0.10 mg. X 15.4. FIG. 4.—Embryo of 8 days, 16 hours. Note the distinct lumbar and cranial flexures. Crown-rump length, 3.5 mm.; weight, 1.57 mg. X 13.3. FIG. 5.—Embryo of 9 days, 4 hours. Note that lumbar, cervical, thoracic, and cranial flexures are distinct. Crown-rump length, 4.0 mm.; weight, 1.36 mg. X 8.4. FIG. 6.—Fetus of 10 days, 12 hours. Note that the head is more erect. Crown-rump length, 6.3 mm.; weight, 19.9 mg. X 5.2. FIG. 7.—Fetus of 12 days. Note that the head and thorax have straightened. Crown-rump length, 10.0 mm.; weight, 21.4 mg. X 4.5. FIG. 8.—Fetus of 13 days. Note rounded body. Crown-rump length, 14.0 mm.; weight, 165.7 mg. X 2.9. FIG. 9.—Fetus of 14 days. Crown-rump length, 13.4 mm.; weight, 300.4 mg. X 2.8. FIG. 10.—Fetus of 15 days. Crown-rump length, 23.3 mm.; weight, 1202.1 mg. X 2.1.