various writers but this field is barely touched as most analyses are based on old, abandoned nests when most of these litter dwellers drop to the ground as soon as their substratum becomes thoroughly desiccated. The potential fauna and flora of ungathered nesting material, then, should be the next step towards explaining origins of biota and dispersal of species of small size.

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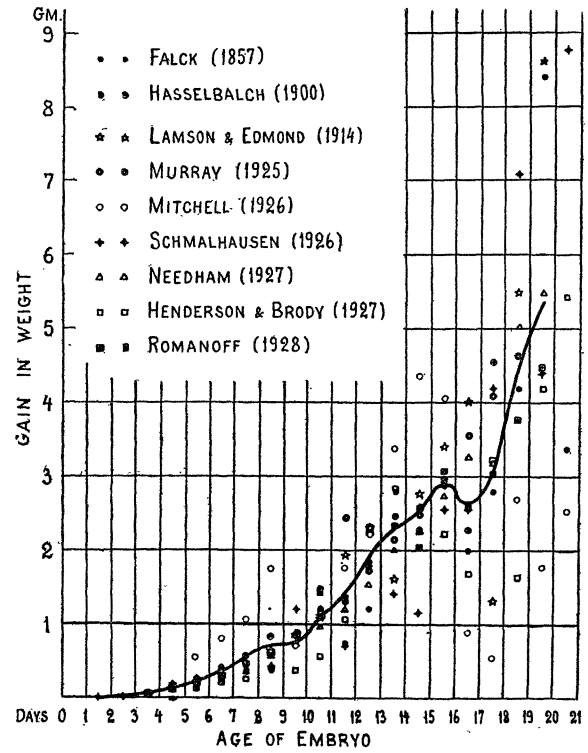
CYCLES IN THE PRENATAL GROWTH OF THE DOMESTIC FOWL

THE growth of the fowl's embryo, like the growth of mammalian embryos, of man's, for example,[1] consists of alternate periods of rapid and slow growth. These oscillations or growth-cycles are not accidental; they are easily distinguishable from accidental fluctuations, and they occur at very nearly the same places in the growth curve of every normal embryo.

This subject received very little attention in the past. The early investigations of Falck[2] and Liebermann[3] were insufficient to show the growth-cycles. Later, Hasselbalch[4] and Lamson and Edmond[5] gave more experimental data, from which Brody,[6] applying statistical methods, could demonstrate two growth-cycles. Then Murray,[7] adding his own data, concluded that there must be "three chief cycles."

Since the number of observations from which the above conclusions were made was very small,[4, 5] further study of the cycles seems to be necessary. The recent data of Mitchell,[8] Schmalhausen,[9] Needham,[10] Henderson and Brody[11] and Romanoff[12] may throw light not only on the number of cycles but on the approximate times of them in the life span of the embryo, as well.

The summarizing data on the accompanying chart of the daily gain in weight of the embryo show that:



(1) In general, the fluctuations in growth are not accidental and not the result of experimental error, but are oscillations caused by the normal chemical and physiological processes in the course of prenatal development. (2) There are at least three well-distinguished cycles in the growth of the fowl's embryo. (3) The retardation of the growth usually falls within a definite age of the embryo, that is, at nine and sixteen days of incubation.

These cycles are found to be regular only under uniform conditions of incubation, when the temperature and the humidity are accurately controlled.[13] If the conditions of incubation happen to be changed the cycles invariably occur, but the time of their occurrence will be shifted. For example, should the temperature be higher, the same cycles will appear earlier. On the other hand, should the temperature be lower, the same cycles will appear later.[11] If the conditions of incubation happen to be extremely abnormal, the cycles are not distinctly outlined, as in the case of extremely variable humidity.[12]

While there is enough evidence to believe that the growth-cycles have a pronounced influence on the physicochemical side of the embryonic development, they must have more recognition in future than they have had in the past by scientists working in the field of experimental embryology.

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