

(the embryo in a narrower sense), appear over the lower, or yolk hemisphere of the egg.

26 (72). **"Rejuvenescence in protozoa": GARY N. CALKINS.**

The process of conjugation in protozoa involves either temporary or permanent union of two individuals. During this union there is a fusion of nuclear material from both organisms resulting in the formation of new cleavage nuclei in each exconjugant. The process is directly comparable with fertilization of an egg by a spermatozoön, and the biological significance of the phenomena involved is probably identical in all living things.

Since 1876 it has been generally assumed that one effect of conjugation is rejuvenescence or renewal of vitality in both of the exconjugants. This assumption has never been submitted to experimental proof. In his *Paramecium* work, begun in 1901, the author almost had the proof, but allowed the opportunity for obtaining it to slip through his fingers without realizing its importance at the time. The author's object in bringing this up at the present time is to announce that on the last day of February (1905) he started a new series of experiments with *Paramecium*, consisting of three different lines at present in about the fortieth generation after conjugation, mainly for the purpose of completing his earlier work.

Another point of general biological importance will also be investigated. In his original experiments the author found strong evidence that the old view that both exconjugants are rejuvenated is erroneous. In twenty pairs which were cultivated after separating from conjugation, one individual of each pair invariably outlived the other, thus indicating an incipient fertilization like that in metazoa. This phenomenon will be given careful study in the experiments now under way.

27 (73). **"Temperature and muscle fatigue": FREDERIC S. LEE.**

It has been pointed out previously by the author and others that the contraction process of the muscles of cold-blooded animals in the course of fatigue becomes greatly slowed, while those of warm-blooded animals show no such phenomenon. Lohmann has recently claimed that a cold-blooded muscle on being heated

to a mammalian temperature shows a course of fatigue similar to that of mammalian muscle, and on the other hand, that a warm-blooded muscle on being cooled, fatigues like the muscles of cold-blooded animals at a similar temperature. From the supposed effects he concludes that in the matter of fatigue there is no real physiological difference between the two groups of muscle.

The author has investigated the question by very careful methods in a considerable variety of animals, and has not been able to confirm Lohmann's conclusions. The muscles of the frog and the turtle show their characteristic method of fatigue whatever the temperature. The muscles of warm-blooded animals on being cooled and then fatigued, show either no slowing of the contraction process or only a slight slowing. The latter seems to be most pronounced in the rodents, namely, the rabbit, the mouse and the rat. [See page 37 (101).]

28 (74). **"On intraureteral pressure and its relation to the peristaltic movements of the ureter,"** with demonstrations: **DANIEL R. LUCAS.** (By invitation.)

By means of a cannula placed in the ureter and retained without ligatures, and which did not materially interfere with the peristalsis of the ureter, the intraureteral pressure and its relation to the peristaltic movements of the ureter were ascertained.

In nine experiments on dogs narcotized with morphin and atropin, the pressure in the ureter arose only to a minute degree, the average being a negative pressure, more pronounced under the influence of diuretics. In five, in which chloroform was used, the pressure was always positive; the irritability and contractility of the ureter were noticeably diminished. In six, under ether, the ureter was noted to be irritable and contractile three hours after the anesthesia was commenced; the pressure was low. In four, in which ether followed the administration of chloroform, ether showed a stimulating effect on the peristalsis, running the pressure rapidly down. In three, in which morphin and atropin, chloroform, and ether were successively tried during the same experiment, the specific effect of each as above noted was again observed. In an animal in which anesthesia was produced by decerebration, irritability and contractility of the ureter muscle were noted; the pressure was low, tending to negative on stimulating the ureter distal