

## DISCUSSION AND CORRESPONDENCE

### THE SEX-CHROMOSOMES OF SEA-URCHINS

AT page 758 of the recently published new (third) edition of my book "The Cell in Development and Heredity" will be found a confusing inconsistency that somehow escaped attention until too late for correction in the proof-sheets. Its source lies in the following passage relating to the observations of Tenent, Baltzer and others on the sex-chromosomes of sea-urchins:

The critical evidence was obtained from forms in which the sex-chromosome is characterized by its atelomitic or non-terminal attachment, and has accordingly the shape of a V or U (*Parechinus microtuberculatus*) or of a J (*Paracentrotus*, *Toxopneustes*, *Hipponoë*, *Möira*). All the observers named, beginning with Baltzer, have found the segmenting eggs to be of two kinds, some containing one such sex-chromosome and others two, in addition to certain atelomitic chromosomes common to both.

Two errors occur in this passage. One is the inadvertent inclusion of *Toxopneustes* (which has a V-shaped "sex-chromosome") with those in which it is J-shaped or hook-shaped (*Hipponoë*, etc.). The other and more serious one is the statement that some eggs "contain one such sex-chromosome and others two." The word "two" here should be "none"—a slip which I can only explain as the result of a *lapsus calami*, and which causes the passage to be quite inconsistent with the correct statement of the facts given a few lines below.

The confusion is increased by the unlucky designation, in the succeeding paragraph, of the "sex-chromosome" or "heterochromosome" in these animals as an "X-chromosome." In point of fact, the nature of this chromosome has never been finally demonstrated. Miss Pinney labeled it as "x" in *Möira*, and elsewhere referred to it as an "odd chromosome"; but both Tenent and Baltzer proved that in fertilization it is derived from the sperm; that it is present in only half the fertilized eggs and that it is never doubled. The natural interpretation of these facts, evidently, is that the chromosome in question is a Y-chromosome, the synaptic mate of which is a rod-shaped X-chromosome that is single in the male and paired in the female. This harmonizes with Baltzer's (1913) comparison of the condition in sea-urchins to that of the *Lygaeus*-type in insects; but its correctness should be tested by study of the spermatogenesis.

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### OLDER PUBLICATIONS ON COLLOIDS

I TAKE this means of calling to the attention of all scientists interested, a book entitled "On the Influence

of Colloids upon Crystalline Form and Cohesion, with Observations on the Structure and Mode of Formation of Urinary and other Calculi," by William Miller Ord, M.D. (Lond.), Fellow of the Royal College of Physicians in London, of the Linnaean Society, of the Royal Microscopical Society, etc. It was published by Edward Stanford, of London, in 1879, and sums up work that had been done by the author over the preceding 12 years. It also refers to splendid work done by Mr. George Rainy, lecturer and demonstrator at St. Thomas's Hospital as far back as 1857, most of which is buried in oubliette journals. These men and others working with them were far in advance of their time. They saw and recorded important truths at a time when the prevailing professorial practice was to relegate to the sink or the waste can anything that would not crystallize. *Bone formation* is one of the points discussed.

Attention should also be directed to a doctor's thesis of the University of London, "On the internal pressure of liquids," by H. Kneebone Tompkins, D.Sc., which Professor F. G. Donnan resurrected and published for the first time in the report of a general discussion on colloids (Faraday Soc. and Phys. Soc. of London, 1920). On pages 185 to 188 the analogies between vulcanized caoutchouc and *metals* is treated at some length.

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### HONOR TO WHOM HONOR—

IN the issue of SCIENCE for September 5, 1924, pp. 208-9, I note the following:

Former President Charles W. Eliot, with his inimitable style, wrote for this tablet [on one of the buildings of the Harvard Medical School] a few words which embody so perfectly the spirit of research that they should be on the wall of every educational institution. The inscription reads: "Life is short and the art long, the occasion instant, experiment perilous, decision difficult."

A little further on comes this sentence: "Here we might well repeat Dr. Eliot's words, 'The occasion instant, experiment perilous.'"

Now I am not moved by envy of Dr. Eliot's "inimitable style" for which I have all due respect, and I heartily concur in the general estimate of the value of the sentiment, but of course the inscription is nothing more than an English version of a portion of the first of the *Aphorisms* of Hippocrates, the founder of scientific medicine. It is also, I confess, a bit disconcerting to think that at the most magnificent medical establishment in the world, anybody at all, even a janitor, if it so be, could, in answer to a visitor's inquiry, ascribe the most famous saying of the most