characteristic of continental sediments, the local breaks not representing a loss of geologic time of any marked historical value."

The plants certainly do not uphold this contention, but they do indicate a very considerable hiatus between the top of the acknowledged marine Cretaceous section and the inauguration of the Lance. The Laramie is not known within this area, but can it be doubted that it was the interval during which in other areas beds of Laramie age were laid down and subsequently removed in whole or in part? That there was an important interval of some kind is also shown by the fact that it was sufficiently long for over 60 per cent. of the marine Cannonball fauna to be derived through modification of the typical Fox Hills fauna.

F. H. Knowlton

PROOF OF NON-DISJUNCTION FOR THE FOURTH CHROMOSOME OF DROSOPHILA MELANOGASTER

During the spring and summer of 1920 I secured genetic evidence that strains of *D. melanogaster* haploid for the fourth chromosome had been produced by non-disjunction, and in November cytological verification was obtained. The fact that non-disjunction of the fourth chromosome is known to occur is perhaps the strongest reason for believeing that the aberrations observed by Dr. Little[1] may be the consequences of non-disjunction. The direct evidence presented by Dr. Little by no means proves such to be the case, which is unfortunate, considering the ample means in *D. melanogaster* for checking up this hypothesis by means of other fourth-chromosome mutants (bent, shaven) and especially by direct cytological examination. Probably Dr. Little will include such evidence in his forthcoming detailed report. For the present, his published evidence is in better conformity with the assumption of a less extreme eyeless allelomorph, or of a dominant fourth-chromosome "minus" modifier. On the non-disjunctional view selective reduction of the three fourth chromosomes present is required, but there is no obvious reason why E and e should always go together in the manner assumed. A simple explanation is supplied on the weak-allelomorph view, for $\overset{\smile}{Ee}$ is the weak allelomorph and the selective reduction $\overset{\smile}{Ee} - e$ is simply *segregation* in the $e^{w} - e$ compound. *Linkage* supplies the explanation on the modifier view, for the E is then a dominant minus modifier in the fourth chromosome, and $\overset{\smile}{Ee} - e$ is simply $\overset{\smile}{M^{e}e} - e$. As far as can be judged from the short account given, all the observed ratios are in conformity with either of these views. Thus, Dr. Little has not proved by direct and available means that the case is actually one of non-disjunction, nor has he proved it negatively by excluding well-recognized alternative hypotheses which are equally valid and even more in harmony with the facts of the case as stated.

C. B. Bridges

[1] Science, 53: 167.

SURVEYING FROM THE AIR

The article on "Surveying from the Air," December 17, 1920, is a summary of the work of the Coast and Geodetic Survey along the lines of aerial photography, and of necessity does not go into the requisite detail regarding the reasons for making the following statement:

> These experiments proved very conclusively that photographs from the air, using present-day equipment, are of little practical value to the hydrographer.

This statement has been noted by Mr. Willis T. Lee, of the U. S. Geological Survey in Science, February 18, 1921, who cites *Comptes Rendus* Tome 169, October 27, 1919, in which mention is made of experiments near Brest where successful photographs were obtained of the bottom at a maximum depth of 17 meters.

During the experiments at Key West, the results of which were the only ones then known to me, occasional successful photographs of the bottom were obtained in depths of 35 feet and less. No attempt was made to photograph at greater depths. When the conclusion regarding the "practical value" of the photographs was arrived at, all factors re-