If I might venture to point out what seems to me to be the weak point in my own view I should regard the evidence that the crossing observed in the chiasma type really takes place is by no means as yet established (see Gregoire, "La Cellule," 1910); for, while the twisting can not be doubted it is still an open question as to whether the chromosomes may untwist before the "split in one plane" appears.

T. H. Morgan

Columbia University

### THE COTTON WORM

To the Editor of Science: In connection with the correspondence of Dr. H. T. Fernald in the October 13 issue of Science on the cotton worm in Massachusetts, it may be interesting to note that there has been a very heavy migration of this insect (*Alabama argillacea* Hubn.) in the city of Pittsburgh this year. The moths began to arrive about the tenth of September and reached the maximum numbers on September 23, on which date hundreds were to be found on electric light poles and buildings in the heart of the city and passing street cars stirred up swarms from sunny places. The insects are still present (October 17) but not in very large numbers.

John L. Randall

### THE AIR BLADDER IN CLUPEA HARANGUS

In Science (October 13, 1911) I described the air-bladder of *Ophiocephalus* and called attention to the desirability of an investigation of the condition of the posterior duct to the air-bladder in *Clupea harangus*. In this connection Dr. Gill has kindly called my attention to a lecture by Professor Huxley, published in *Nature* (April 28, 1881) in which he (Huxley) shows conclusively that *Clupea* has the posterior duct actually open to the exterior.

E. C. S.

## *QUOTATIONS*

### BENZOATE OF SODA AGAIN

The American public believes that a question is not settled until it is settled right. This probably accounts for the fact that the sodium benzoate question will not down. And yet, although volumes have been written on this much controverted subject, the problem itself is really a simple one. There are three basic facts on which all are agreed: First, no one denies that sodium benzoate in foods may prove harmful in certain quantities, under certain conditions or when given to certain classes of individuals. Second, no one denies that foodstuffs of a high quality can be put up without the use of sodium benzoate; in fact the best food manufacturers do not use this chemical. Third, no one denies that when this chemical is used, scrupulous cleanliness and extreme care in handling are no longer necessary. These are three incontrovertible facts, admitted grudgingly or frankly, as the case may be, by both pro- and anti-benzoate forces. Under the circumstances, then, it is not irrational to conclude that sodium benzoate should not be used as a food preservative.

And now comes from Berlin the "Expert Opinion of the Royal Scientific Deputation for Medical Affairs Regarding the Use of Benzoic Acid and its Salts for the Preservation of Food." These experts were requested by the Minister of Education and Medical Affairs in Germany to give their opinion on this subject. In their report, they first describe the chemical and physiologic action of these drugs and then briefly summarize the findings of various scientists on the question at issue. Of the decision of the United States referee board, these German scientists say:

> The series of experiments in this connection made by the American scientists are of too short duration and the results coupled with certain limitations, so that they can not be regarded as demonstrating the unconditional non-injurious nature.

After considering all of the evidence on the subject the Scientific Deputation for Medical Affairs reaches the following conclusions:

> In regard to the admissibility of the use of benzoic acid and its salts for the preservation of food it is mentioned that in France on the basis of a decision of the Commité consultatif d'hygiène publique of October 1, 1888, the Minister of Justice

in his circular dated October 16, 1888, prohibited the use of benzoic acid in drinks and food.

In Austria the Supreme Sanitary Council in an expert opinion dated December 16, 1899, decided in favor of a prohibition of preserving substance containing benzoic acid or its salts, and has adhered to this standpoint in a recent expert opinion and given a detailed justification of the same. In the same sense the Saxon Landes-Medizinal-Kollegium expresses itself.

The Scientific Deputation for Medical Affairs is likewise of the opinion that the use of benzoic acid and benzoic acid salts for the preservation of food should not be permitted. Even if small doses of the same may be considered harmless for the human organism there is still a danger that, with the addition of these substances to the various food and drinks on the whole quantities would be daily consumed, which would be injurious to the organism. This fear is particularly justified in the case of children, the aged, and weak or sick persons, whereby it is to be observed that even in the case of normal food not preserved with benzoic acid substances are introduced from which benzoic acid comes into existence in the body.

A further objection against the use of chemical preservatives at all consists in the fact that in its use the food intended for consumption may not be handled with the necessary care and cleanliness to prevent its decay or injury by fungi and that, being neglected by the manufacturers and sellers, under certain circumstances the quality of the goods would suffer. . . .

Similar objections exist regarding albuminous food liable to decay. The experiments of the imperial health office have demonstrated among other things that a slight smell of decay in chopped meat may be concealed, but not entirely removed, by merely stirring or turning over the meat; but on mixing with 0.25 per cent. benzoic acid or sodium benzoate the smell disappears for a time. By this process, therefore, food which has already commenced to decay can be given the appearance of freshness and the purchaser deceived as to its quality.

These findings agree exactly not only with the opinion officially expressed by the American Medical Association in its resolutions on this subject, but also with the opinion held by other scientific bodies and by the intelligent public generally. With the reorganization of the Department of Agriculture, which is as inevitable as it is necessary, it is to be hoped that the United States government will soon cease to hold its present inconsistent position on the subject of the use of sodium benzoate in foods. This chemical has no place in the dietary of any people and certainly its legalized use is a disgrace to an enlightened nation.—*Journal of the American Medical Association.*

## SCIENTIFIC BOOKS

*Memorial Volume Commemorative of the Life and Work of Charles Benjamin Dudley, Ph.D., Late President of the International Association for Testing Materials and of the American Society for Testing Materials.* Published by the American Society for Testing Materials, Philadelphia, Pa. 1911.

The book is, in fact, the proceedings of a memorial session held by the American Society for Testing Materials on June 29, 1910. The proceedings began with the presentation of a sonnet in memory of Charles Benjamin Dudley by Harvey W. Wiley and closed with a personal tribute by Robert W. Hunt. Other contributions to the proceedings consisted of discussions of several phases of Dr. Dudley's character, his life, and his work, by the different officers and members of the association, respectively, as follows: Introduction, by Vice-president Robert W. Lesley; Dr. Dudley as a Railroad Man, by Theodore N. Ely; Dr. Dudley as a Chemist, by Edgar F. Smith; Dr. Dudley as a Metallurgist, by Henry M. Howe; Dr. Dudley as a Mentor, by B. W. Dunn; Dr. Dudley as a Citizen, by W. H. Schwartz. These discussions were followed by minutes and announcements on the death of Dr. Dudley and copies of various papers and addresses by him.

The discussions of the phases of his character and life were all highly eulogistic, as might be expected, but everything said was fully justified. His life and character were worthy to be studied and copied by all, and particularly to be studied and used as an example and inspiration for young men. Mr. Lesley well summed up his character when he said, "he was a diplomat of the heart, a nobleman of nature's handiwork . . ." and further