

Ames, "Theory of Physics" (1897), page 398: ". . . when the satellite will disappear behind Jupiter, *i. e.*, be eclipsed."

Watson, "A Text-book of Physics" (1899), page 505: ". . . when Jupiter and the earth are nearest together (at conjunction), and that which occurs when they are at their greatest distance (opposition)."

Rowland and Ames, "Elements of Physics" (1900), page 172: ". . . and so, if the eclipses of a satellite behind a planet's disc. . ."

Eggar, "Wave-motion, Sound, Light" (1901), page 504: ". . . the times of eclipse of one of the moons, *i. e.*, the instants at which it should pass behind the planet and emerge from his shadow."

Crew, "Elements of Physics" (1906), page 311: "Jupiter has five moons, one of which is larger and brighter than any of the others, and is called the 'first satellite.'" See also "General Physics" (1908), page 429.

Henderson and Woodhull, "Elements of Physics" (1906), page 290: "The eclipse was seen while the earth and Jupiter were on the same side of the sun—as the astronomers say, 'in conjunction'—the time was 16' 36" earlier than when the earth and Jupiter were on opposite sides of the sun; that is 'in opposition.'"

Millikan and Gale, "A First Course in Physics" (1906), page 388: "Roemer was making observations on the largest and brightest of Jupiter's seven moons." "Roemer first determined the interval between two successive eclipses, . . . and found it to be 48 hr. 28 min. and 36 sec."

Gage, as revised by Goodspeed, "Principles of Physics" (1907), page 276: "He made observations on that one of the five of Jupiter's satellites which is nearest to the planet."

Duff (editor), "A Text-book of Physics" (1908), page 339: ". . . when Jupiter and the earth are in conjunction, or on the same side of the sun and in line with it." ". . . at opposition, when the earth is on the opposite side of the sun from Jupiter."

Leaving out of consideration the number of Jupiter's satellites at any date, each of the above quotations has one error and some of them two. In many books it is stated that Roemer found the time for the light to cross the earth's orbit to be 16 min. 36 sec. This is nearly the present accepted value, while that

deduced by Roemer was considerably greater, some 22 min.

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AIR IN THE DEPTHS OF THE OCEAN

TO THE EDITOR OF SCIENCE: With reference to the communications appearing in the issues of August 25 and October 27 in relation to "air in the depths of the ocean," while it is erroneous to hold that the amount of dissolved gas is dependent upon hydrostatic pressure, yet the gas content of the bottom waters may be greater than the gas content of the surface waters because of the greater solubility of the gases at the low temperatures prevailing in the depths of the ocean. Sea water contains, in proportions varying widely with circumstances, four gases—oxygen, nitrogen, carbonic acid and argon. The oxygen decreases and the carbonic acid increases with increasing depth; but there is a respiratory process in operation by which the carbonic acid ascends by diffusion right up to the surface, while the oxygen by the same means makes its way to the bottom. This allows us to understand how the supply of oxygen, which is indispensable to the life of the animals everywhere existing in the depths of the ocean, is renewed even down to the bottom and an exchange made between the carbonic acid gas produced by their respiration and the oxygen coming from above.

G. W. LITTLEHALES

CONTAGIOUS ABORTION OF CATTLE

TO THE EDITOR OF SCIENCE: In a recent number (October 13) Director H. L. Russell, of the Wisconsin Agricultural Experiment Station, announces the discovery of the fact that the contagious abortion of cattle in this country is identical with that of Europe, and due to the *B. abortus* of Bang. Professor Russell apparently regards the investigations carried out at the Wisconsin Station since May, 1911, as the first creditable bacteriological work upon this subject in this country, and his communication would seem to cast some doubt upon the accuracy of the observa-

tions and conclusions previously recorded by me.

The experimental evidence concerning the identity of the *B. abortus* isolated at the Illinois Agricultural Experiment Station in 1909 has been presented in several papers,¹ and, in connection with the literature reviewed in the same papers, seems to me to be conclusive. Cultures of the organism have been furnished to several laboratories in various parts of the country. A culture of this bacterium was requested by Professor E. G. Hastings, of the department of bacteriology, Wisconsin Agricultural Experiment Station, in March, 1911, and such a culture was sent to him on April 5, 1911.

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THE MEETINGS OF SCIENTIFIC SOCIETIES

TO THE EDITOR OF SCIENCE: The reasons for isolating the meetings of the American Society of Naturalists, with its two affiliations, the Zoologists and Anatomists, from all other scientific organizations meeting during the Christmas recess seem to be as follows, judging from the chance statements of some of the officers of the societies: (1) Better facilities for delivering papers in the way of apartments, lanterns, etc.; (2) better living accommodations; (3) better chances for the members to become acquainted; (4) isolation from temptations to spread the interests over a wide field. If other reasons have been given, I have not heard them expressed.

Now, of these reasons, the first and second do not seem to me of any validity. A good lantern and comfortable meeting rooms can readily be obtained at any of the centers where

¹ MacNeal and Kerr, *Journal of Infectious Diseases*, 1910, Vol. 7, pp. 469-475. MacNeal, Society of American Bacteriologists, Ithaca meeting, 1910. Abstract in *SCIENCE*, 1911, Vol. 33, pp. 548-549; *Centrbl. f. Bakt.*, I. Abt., Ref., 1911, Bd. 49, pp. 390-391. Full paper in *Illinois Agriculturist*, March, 1911, pp. 8-14. MacNeal and Mumford, Illinois Agricultural Experiment Station Bulletin No. 152 (1911, in press).

the larger association meets and in regard to living conditions, I am quite sure that the cities where the American Association for the Advancement of Science meets can offer accommodations equal to those demanded by the most discriminating members of the Naturalists, Zoologists and Anatomists.

With regard to the third reason, I believe that this too, is of minor consideration—not because I do not value the social function of the meetings, for I am under the impression that this factor is paramount. What I mean is that smokers and hotel lobbies and the meetings themselves take care of this element quite well and well enough. If the officers and members who are solicitous in making the meetings a success will present themselves at the various functions rather than seek a quiet corner where they may enjoy the company of a chosen few of their friends to the exclusion of others who would care to meet them, I am quite sure that the third reason will pale into insignificance.

The fourth question seems to me to be the one which is cardinal. I am afraid that it is born of an indifference which certain members have towards any work in zoology or in biology in general which does not have certain relationships. If one will read over the programs of the Zoologists and Anatomists, he will find that papers upon topics of nomenclature, systematics, descriptive zoology and embryology, bionomics and some other subject matter are conspicuously absent from the one and that invertebrate topics are excluded from the other. This means that the rôle of these two societies is not to cover the legitimate field of zoology, but is limited to certain aspects; this is especially true of the Eastern Branch, but less true of the Central Branch of the Zoologists.

In the case of the Naturalists, the limitation of the field is more conspicuous than in the other cases, for here we have an organization which purports to be a nucleus around which the other biological societies are supposed to convene, whose field is more limited than any of the others! I am quite well aware that