DISCUSSION AND CORRESPONDENCE

NEWTON'S CORPUSCULAR THEORY OF LIGHT

To the Editor of Science: For more than half a century various text-books on physics and other publications dealing with the phenomena of light, contain assertions to the effect that Newton's corpuscular theory of light received a knock-out blow when it was demontrated that light required a longer time to pass through water than through air.

Quoting, for example, from the last (11th) edition of the Encyclopædia Britannica, Vol. XVI., page 618, we read:

> In the earlier part of the 19th century, the corpuscular theory broke down under the weight of experimental evidence, and it received the final blow when J. B. L. Foucault proved by direct experiment that the velocity of light in water is not greater than that in air, as it should be according to formula (1), but less than it, as is required by the wave theory.

The object of this note is to show that the observed data are just as favorable for Newton's theory as they are for the wave theory of light.

Compared with Newton's corpuscle, the hydrogen unit of chemistry must evidently be regarded as a very large mass.

In passing between the molecular masses (H_2O) of which the water is composed, the path of the corpuscle would be much longer than the path in air between the widely separated N_2, O_2, H_2O and other masses. Consequently, if the ratio of the actual length of the path in water to the actual length of the path in air is greater than the ratio of the velocity in water to the velocity in air, the time required for the corpuscle to pass through the water with the greater velocity, will be longer than that required to pass through the air.

J. M. Schaeberle

Ann Arbor,
May 31, 1921

GERMAN SURTAXES ON SCIENTIFIC PUBLICATIONS

To the Editor of Science: I read with interest the letter of M. W. Senstius in Science for April 8, 1921, in which he stated that a publisher in Leipzig had informed him that he had "abolished all foreign surtaxes on journals published by his firm," and that the publisher stated further that it was a "matter of regret to him that he is not (yet?) at liberty, owing to the binding regulations of the Börsenverein, to do the same with his own books."

I at once wrote to the publisher, Wilhelm Englemann, stating that I had read Mr. Senstius's letter in Science, and inquired whether the journal—*Botanische Jahrbücher*—was included in his list of exempt publications, and what the subscription rate of the periodical would be to us. I give below a close English translation of Mr. Engelmann's reply under date of May 2, 1921:

> In answer to your very valued letter of April 12, 1921, may I reply that Mr. Senstius in his article in Science of April 8 emphasizes that all the journals *which appeared from my press after January 1, 1921, would be supplied without the exchange tax (Valuta Aufschlag)!*
>
> On all journals and sets (Sammelwerke) appearing before the end of 1920 there is a publisher's additional charge (surtax, *Verlegerteuerungszuschlag*) of 200 per cent. plus, at the time only, 100 per cent. exchange tax exempt! In accordance with the enclosed circular this publisher's surtax was increased from May 1, 1921, to 300 per cent. of which you will please take note!
>
> With reference to Series I., Botan. Jahrbücher, this 300 per cent. is charged, plus the Valuta additional!

On the back of Engelmann's letter were two notices rubber-stamped, the first stating that his firm would supply all periodicals issued after January 1, 1921, without the Valuta charged, but the second rubber-stamped notice stated that on account of the unusually stringent conditions, there would be added a 300 per cent. publishers' excess charge on all of his publications which appeared previous to the close of 1920, as stated in the letter just quoted. The enclosed circular, to which his

letter referred, contained the same statement, indicating in addition that the 300 per cent. additional charge would become effective on and after May 1, 1921.

C. STUART GAGER
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QUOTATIONS

CENTENARY OF THE FRENCH ACADEMY OF MEDICINE

OUR Paris correspondent has told of the celebration, beginning Dec. 20, 1920, of the most important anniversary connected with French medicine—the centenary of the Academy of Medicine, which has the same preeminence in medicine that the general French Academy bears in relation to the more liberal arts. Its roster bears only the names of those who have by years of achievement won recognition in the profession, and there are few below middle life who have been accorded the honor of election. Trousseau, who received the academy prize in 1837 for his classical treatise on laryngeal phthisis, was considered unusually fortunate in that he gained admission in his thirty-sixth year. The academy was founded in 1820 by royal edict of Louis XVIII., although its name appeared as early as 1804 as an entirely ephemeral institution, the chief interest attaching to it being that Dr. Guillotin was one of its presidents. The French Revolution, with its ruthless submergence of all that pertained to the old order of things, dissolved all medical associations, and among these the Academy of Surgery and the Royal Society of Medicine, which after nearly a century of existence disappeared, to come to life again in the founding of the present Academy of Medicine. The initial concept of the academy was the formation of a body which, by its scientific labors and achievements, should be an asset to the state in matters of public health. The decree which constituted it lays down certain functions which it was to carry on. Among them were improvements in the method of vaccination against smallpox, the measures for the control of epidemic diseases, regulations as to and concerning legal jurisprudence, and the examination of and passing on new remedies, together with the limitation of the sale of nostrums, both those of French and those of foreign origin. While the present academy still holds the latter function, its work, to a large degree, is hampered by the administration of French law, as was pointed out in a former editorial.

The *Bulletin* of the Academy for Dec. 20–22, 1920, is devoted to a review of the history and labors of the society since its foundation. It records a century's achievement by men whose names are known the world over: Pinel, Laënnec and Broussais in the early days; Trousseau in the thirties; Villemin and Pasteur, and on down through the list of those who have added to the sum of certain knowledge which has lifted medicine from scientific guesswork to the dignity of a precise science.—*Journal of the American Medical Association.*

SPECIAL ARTICLES

RESISTANCE TO STEM RUST IN KANRED WHEAT

A CYTOLOGICAL study of *Puccinia graminis tritici* on Kanred wheat, conducted by the Office of Cereal Investigations in cooperation with the California Agricultural Experiment Station, has yielded several facts of interest.

The strain of stem rust under observation and herein reported was obtained from the Berkeley breeding plats. Seedlings of susceptible varieties of wheat grown in the greenhouse produced abundant pustules but, in repeated trials with Kanred, the fungus failed even to produce flecks.

It was found that the urediniospores germinate readily on Kanred leaves and that the germ tubes make their way directly to the stomata. On reaching a stoma, the tip of the germ tube swells to form an appressorium and practically all of the protoplasm flows into it, leaving the germ tube empty. Under favorable conditions for germination these appressoria develop promptly and in great numbers. Often one may observe two, three, and even four spores, with their appressoria, crowded together at a single stoma.

In spite of this, relatively few appressoria enter the stomatal slit in Kanred to form my-