the light from a star, an instantaneous photograph may be taken of a sound wave moving across the field of view.

Professor Wood has in this way obtained photographs showing the wave-front forms which occur in various cases of reflection, refraction and diffraction. An auxiliary electric spark is employed as a source of the sound waves to be photographed.

THE HYDROLYSIS OF STANNIC CHLORIDE.

SOLUTIONS of stannic chloride show abnormally low freezing points. Mr. Wm. Foster* has shown that this abnormal behavior is to be ascribed to the hydrolysis of the stannic chloride, namely, the formation of HCl and stannic oxide, so that in dilute solution there is slowly formed four dissociated molecules of HCl instead of one dissociated molecule of $SnCl_4$. The freezing-point constant calculated upon this assumption is 14.06 and the value observed by Loomis is 14.25.

THE SPECIFIC HEAT OF SOLUTIONS.

PROFESSOR MAGIE† has shown theoretically that the heat capacity of a solution of a non-electrolyte, osmotic pressure being proportional to the absolute temperature, is the sum of the heat capacities of the solvent and of the solute, and he has derived an expression for the change in heat capacity of any solution due to change in concentration when the relation between osmotic pressure and temperature is given.

In case of non-electrolytes the above-mentioned relation is verified by experiments of Marignac and by more acurate measurements carried out by the author. Professor Magie points out that sufficient data are not at present at hand to verify the more general relation mentioned above.

MAGNETISM AND STRETCH-MODULUS OF STEEL.

STEVENS and Dorsey‡ have shown that the stretch modulus (Young's modulus) of iron and steel is very slightly increased by magnetization in the direction of the stretch.

W. S. F.

* *Physical Review*, IX., p. 41.

† *Physical Review*, IX., p. 65.

‡ *Physical Review.*

*THE BACILLUS ICTEROIDES AS THE CAUSE OF YELLOW FEVER.**

Sanarelli reproaches me with not being willing to yield to the evidence in favor of the specific etiological rôle of his bacillus. I am not influenced in my scientific conservatism by any feelings of jealousy, and shall be ready to do full honor to the discoverer when the discovery is definitely established. At present I cannot admit this for the following reasons :

First. Sanarelli's bacillus grows readily in the culture media employed by me in my researches, but in nineteen typical cases of yellow fever in which I introduced into such media blood from the heart of yellow-fever cadavers, this bacillus was not present, the cultures remaining sterile in fifteen. In three of the four cases in which a growth occurred, I identified the bacillus found as bacillus coli communis (my bacillus *a*). I strongly suspect that some of those bacteriologists who claim to have found Sanarelli's bacillus have mistaken for it one of the varieties of the colon bacillus.

Second. In my experiments material from the interior of the liver and kidney, containing blood and crushed tissue elements from fresh cadavers, was added to culture media in which Sanarelli's bacillus readily grows, but I obtained a negative result (cultures remained sterile) in 30 out of 43 cases.

Third. Sanarelli's bacillus is fatal to guinea-pigs and rabbits when injected subcutaneously in very minute doses. In my experiments blood from the heart and crushed liver tissues from the fresh cadaver failed to kill eight out of ten guinea-pigs and seven out of eight rabbits experimented upon. I admit that the value of these experiments is impaired by the fact my laboratory facilities did not permit me to keep these animals under observation as long as was desirable.

Fourth. The experiments made by Drs. Reed and Carroll at the Army Medical Museum, show that Sanarelli's serum in high dilutions, (1–100,000) causes arrest of motion and typical agglomeration (Widal reaction) of theb acillus of hog cholera ; also, that serum from an animal immunized against hog cholera, in high dilu-

*From a reply to Professor Sanarelli, by Dr. George M. Sternberg, published in the *Medical News*.

tions, causes arrest of motion and typical agglomeration of Sanarelli's bacillus; also, that cultures of Sanarelli's bacillus fed to pigs cause the death of these animals, and that the typical lesions of hog cholera are found in their intestine.

Fifth. The blood-serum of yellow fever patients or of convalescents from this disease does not give a marked Widal reaction with Sanarelli's bacillus, although the blood of an animal immunized by the injection of cultures of this bacillus does give the specific reaction in high dilution.

Sixth. So far as I am informed the results obtained in the use of Sanarelli's antitoxic serum do not give support to his claim to have discovered the specific germ of yellow fever.

In a letter dated January 20, 1899, my friend Dr. J. B. de Lacerda, of Rio de Janeiro, says:

"The serum of M. Sanarelli has failed here in Brazil. The results of the experiments which he made at San Paulo have not recommended the employment of this serum. It is neither preventive nor curative."

In a paper recently published in the *New Orleans Medical and Surgical Journal*, Dr. P. E. Archinard reports a negative result from the use of Sanarelli's serum in ten cases. He says:

"From the above cases, which limit our experience with the anti-amarylic serum of Sanarelli as a curative agent in the human being attacked with yellow fever, we are forced to conclude that this agent, in our hands, has shown no curative powers whatsoever, none of the important and dangerous symptoms of the disease having been in any way mitigated or prevented by its administration."

Drs. Reed and Caroll are now preparing a report of their extended researches, which have been going on at the Army Medical Museum during the past two years. This report will be published in due time and will give full details as to the experimental evidence upon which they base their conclusion that Sanarelli's bacillus is a variety of the bacillus of hog cholera.

Finally, I would say it appears to me at the present time that, like the colon bacillus and bacillus *x*, the bacillus of Sanarelli is a pathogenic saprophyte which is present occasionally and accidentally in the blood and tissues of yellow-fever patients, and that its etiological relation to this disease has not been established. If, however, the results reported by Drs. Reed and Carroll can be shown to be based upon erroneous observations, I shall be ready to revise my opinion. Truth is mighty and no doubt in the end will prevail.

INTERNATIONAL CONGRESS ON TUBERCULOSIS.

THE report of Sir Herbert Maxwell, M. P., F.R.S., and Dr. Pye-Smith, F.R.S., the delegates of the British government at the International Congress on Tuberculosis held at Berlin from May 24th to 27th last, has been issued as a Parliamentary paper. The report states, as abstracted in the London *Times*, that the Congress, which was opened by the Herzog von Ratibor, in the presence of the German Empress, consisted of 180 delegates, appointed by and representing different states and universities and other public bodies. A number of papers were read, chiefly by German delegates, but nothing in the nature of a general discussion took place. The proceedings when printed will form a valuable *corpus* of scientific opinion on the subject.

Dr. Pye-Smith adds a memorandum on the medical aspect of the results of the Congress. After giving in some detail the most important conclusions which were recognized—that consumption and other tubercular diseases are caused by the presence and multiplication of the specific bacillus discovered by Professor Koch; that tuberculosis, as a condition directly transmitted by inheritance, is extremely rare; and that phthisis, or pulmonary tuberculosis, in particular, is not catching—Dr. Pye-Smith goes on to describe the following practical points in the prevention of tuberculosis as a widespread and destructive disease which were inculcated by various speakers at the Congress:

A. The primary importance of free ventilation and wholesome and abundant food. Improvement in the dwellings and the food of the poorer classes in this country, and their increasing cleanliness and sobriety, have not only diminished sickness generally, but directly reduce the number of deaths from consumption