

pathology at Wake Forest College School of Medicine, has been appointed professor of pathology at the Medical College of Virginia, Richmond.

DR. ALBERT BACHEM has been appointed professor of radiology and director of the laboratory at the University of Illinois College of Medicine, Chicago.

DR. HOMER G. BISHOP, instructor in psychology at Cornell University, has been appointed assistant professor of psychology at Smith College.

PROFESSOR HANS SPEMANN, of the University of Freiburg, has been called to the chair of zoology at the University of Berlin, to take the place of Professor Heider, who has been made professor emeritus.

DISCUSSION AND CORRESPONDENCE

A NOTE ON THE SURFACE VISCOSITY OF COLLOIDAL SOLUTIONS¹

THE excellent paper by R. E. Wilson and E. D. Ries on "Surface films and plastic solids" (Colloid Symposium Monographs, 1923) encourages me to publish the results of preliminary experiments made in 1922, before I had heard of Messrs. Wilson's and Ries's work, which are in complete accordance with their results.

The method I used differed from theirs. They employed a torsion pendulum, the polar moment of inertia of which was equal to 485 gr cm², and a circular glass plate, 3.8 cm in diameter, in contact with the liquid. I used a slightly more elaborate but, I believe, more sensitive instrument. A small glass rod, 0.4 mm in diameter and 10 mm long, was suspended to a galvanometer wire (Leeds and Northrup rolled phosphor bronze, 0.000125 cm thick = 0.002 inch); a mirror permitted the readings on a scale, and a light damping device provided a steady spot. The instrument itself was the micro-viscometer described previously.² Instead of having the liquid rotated continuously by means of the constant speed motor, it was only rotated by one twelfth of one revolution (30 degrees), or even one thirty-sixth of one revolution (10 degrees), in one minute exactly. The shearing stress was thus very small, and could be decreased at will. The first measurement was made as soon as the solution was poured into the rotating vessel. The other measurements were made with the same solution after a certain number of minutes had elapsed. Hence, the slow building up of the adsorbed layer could be followed. Unfortunately, I had no time to continue this work, and made only a few experiments, one of which follows:

¹ From the laboratories of The Rockefeller Institute for Medical Research.

² du Noüy, P. L., *J. Gen. Physiol.*, 1919, i, 521.

VARIATIONS IN FUNCTION OF THE TIME OF THE SURFACE VISCOSITY OF A SERUM SOLUTION AT 1/10,000 TEMPERATURE = 22° C.

Time in minutes.	0	7	10	15	30	50	90
Readings (proportional to the viscosity).	0	27	40	55	104	170	284

When plotted on paper, the curve shows a very slight upward convexity. After 1½ hours, the surface rigidity is considerable, despite the fact that the thickness of the adsorbed layer is only 41×10^{-8} cm, as I have shown in a preceding paper,² and that this is probably the mean value of the length of the individual protein molecules present in a serum solution.

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NUMBER OF UNITED STATES SCIENTISTS WHEN THE SIGMA XI SOCIETY WAS FOUNDED

THE question has arisen as to what need there was in 1886, when the Sigma Xi Society was founded, for this organization of "companions in zealous research." Was the United States not contributing at that time its full share to the advancement of science?

To find an approximate answer to this question, a brief analytical study was undertaken, based upon the third volume of Poggendorff's *Handwörterbuch*, which gives the names of research men and the titles of their papers in the exact sciences throughout the world for the 25 years from 1858 to 1883. This is the period immediately preceding the founding of the Sigma Xi. I classified the scientists listed in Poggendorff by countries. As the volume covers over 1,400 pages, I took only part of the volume, namely, the first 15 pages of every 100 pages, and then multiplied the figures thus obtained by 6½.

On the basis of the data thus secured, the distribution of scientists over the ten leading countries, for the period 1858 to 1883, was as follows: Austria-Hungary 560, England 633, France 707, Germany, 1,927, Holland 207, Italy 280, Russia 340, Sweden 193, Switzerland 220, the United States 447. In this list Germany stands first with 1,927, and the United States fifth with 447 scientists.

But this mode of comparison is not quite fair; the populations of the various countries should receive consideration. Accordingly, we computed the number of scientists (for the period 1858-1883) for every million of population based on statistics of 1870. Per million of population, Austria-Hungary had 15¼ scientists, England 20, France 19½, Germany 47, Hol-

² du Noüy, P. L., *J. Exp. Med.*, 1924, xl, 133.