editor of *The Hexagon* of Alpha Chi Sigma, and Dr. E. K. Rideal, of Oxford University.

A MEETING of the American Section of the Société de Chimie Industrielle was held at Chandler Lecture Hall, Columbia University, on October 24, 1930. Mr. Arthur H. Sleigh, who as a boy had met Michael Faraday and whose father was intimately acquainted with him, gave his personal recollections—incidentally bringing out the fact that Faraday was greatly interested in botany. Mr. Sleigh exhibited Atkin's book on the flora of Great Britain, published in 1823, which his father and Faraday had jointly used in identifying the plants they found. Dr. René J. Dubos, of the Rockefeller Institute for Medical Research, then addressed the meeting on "Enzymes from Microorganisms and their Application to Industrial and Medical Problems."

A LABORATORY for the study of fresh-water animals of the United States is being installed at the University of Missouri at Columbia under supervision of Dr. Max M. Ellis, director of interior fisheries investigations for the United States Bureau of Fisheries and professor of physiology in the University of Missouri. Its completion within the next few weeks will provide a central point for the observation of chemical and physiological phenomena of fresh-water animals, to which various fresh-water problems of the Bureau of Fisheries will be referred. In order to provide adequate space for carrying on necessary experimental work, the University of Missouri has turned over a section of one of the medical buildings to the work. Funds for the installation of the laboratory were subscribed conjointly by the university and the Bureau of Fisheries.

DISCUSSION

GIBBS'S PHENOMENON

IN May 30, 1930, issue of SCIENCE there appeared a communication from Professor Tomlinson Fort, objecting to the use of the term "Gibbs's phenomenon" for series other than Fourier's series. As the only name which he cites in this connection is my own, readers may possibly infer that I am responsible for this extended use of the term. As this is quite contrary to the fact, I feel that I should make some comment on the point that Professor Fort has raised.

The various developments in orthogonal functions, such as Laplace's functions, Legendre's functions and Bessel's functions, which occur in mathematical physics, present so many analogies to the better-known Fourier's series that it is quite natural and logical to use for the former series an identical terminology in the case of similar properties. So far as Gibbs's phenomenon is concerned this was done as early as 1910 by Weyl[1] in two papers dealing with the behavior of developments in Laplace's functions, Legendre's functions and Sturm-Liouville functions. The extended meaning of the term in the case of Bessel's functions was used by at least one writer[2] prior to my own use of it. The terminology to which Professor Fort objects is therefore not a recent innovation, as his communication may suggest, but a well-established usage on the part of investigators in this field.

Aside from this point, however, I can not agree with several of Professor Fort's contentions. In the first place, the phenomenon in the case of Fourier's series was not first noticed by Gibbs, as he states. It is now well known that it had been pointed out some fifty years earlier by Wilbraham.[3] In the second place, while I entirely agree with Professor Fort as to the fundamental importance of Osgood's classical papers on the general theory of non-uniform convergence, I can not admit that they treat the same point as that involved in Gibbs's phenomenon. In Osgood's discussion the peaks of non-uniform convergence only occur in cases where the limit function is continuous. The examples which he gives of non-uniformly convergent series with discontinuous sum exhibit no peaks. One of the most essential characteristics of Gibbs's phenomenon is the appearance of peaks in the neighborhood of a point of discontinuity of the function developed. I think that it would be quite appropriate to use the term "Osgood's phenomenon" in the case where the limit function is continuous, but not in the situation where the term "Gibbs's phenomenon" has been generally used.

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[1] *Rendiconti del Circolo Matematico di Palermo*, 29 (1910): 308; 30 (1910): 377.

[2] *Cf.* R. G. Cooke, *Proc. London Math. Soc.*, 27 (1928): 171.

[3] *Cf.* historical notes by H. S. Carslaw and C. N. Moore, *Bull. Amer. Math. Soc.*, 31 (1925): 420, 417.

THE PRESENT STATUS OF LACTENIN

MENTION was made in an earlier number of this journal of our work on a bacteriostatic substance in milk. To avoid misunderstanding it seems well to summarize the properties and discuss the possible uses in so far as the present status of the problem permits.

It has been known for some time that milk which had not been heated above 60° C. will inhibit the growth of certain bacteria. We have studied the effect of this material on the mastitis streptococcus. It prevents growth for about six hours, after which

growth suddenly begins and continues at a rapid rate. This growth was shown to result from an adaptation of the streptococcus without using up the bacteriostatic substance. We give the name lactenin to this substance. In sufficient concentration it will completely prevent the multiplication of certain bacteria, such as the scarlet fever streptococcus, so that they finally die.

Lactenin preparations contain protein and it may itself be a protein. It is difficult to separate from the other proteins of whey, although the casein can be readily separated from milk leaving whey with the full activity of the original milk. This difficulty is met by digesting the other proteins with trypsin. Mild digestion does not injure the lactenin. The products of digestion can be removed by dialysis, or the lactenin can be precipitated with alcohol.

Owing partly to its combination with calcium phosphate, the lactenin-containing material in concentrated form is quite insoluble and forms at best a poor suspension. It is possible to remove the calcium phosphate, giving a more soluble material, but the conditions must be carefully regulated to prevent inactivation of the lactenin.

Dried lactenin preparations are 200 to 500 times as active as dried skimmed milk. The method used to determine lactenic activity is to measure the size of colonies of scarlet fever streptococcus growing in a thin layer of veal infusion agar jelly to which horse blood is added. The more lactenin present the smaller the colonies will be. One gram of dried material in 100 gallons of this media will produce perceptible inhibition, whereas one gram in 10 gallons will completely prevent the growth of these bacteria.

Either the dried material or neutral suspension of it will keep for months in the refrigerator without loss in activity. It is probably not a pure substance. It contains protein, but no reducing sugar or elements aside from carbon, hydrogen, oxygen and nitrogen. It exists as a salt of whatever cation may be present, particularly calcium, and appears to have a low isoelectric point.

Lactenin, while very active against some microorganisms, is less active against others.

We make no claims that lactenin is a preservative of the milk or that it could be used for a food preservative. Our investigations have not been concerned with this phase of the question.

It is not known whether lactenin inhibits the growth of mastitis streptococci in the udder, although this appears plausible.

We do not know whether the lactenin in milk has any effect on intestinal infections in animals which drink the milk. It is likely that the stomach acidity would destroy the lactenin.

Since suggestions have been made that lactenin might have a therapeutic value, we would caution against too much hope in this regard until experimental data can be obtained. Satisfactory injections have not been possible up to the present owing to the insolubility of the preparations and the physical properties of the suspensions.

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AN ACCESSIBLE TROPICAL VEGETATION

IN his description of our collection from Barro Colorado Island Dr. Paul C. Standley[1] states that Mr. Salvoza and I must have visited the island at a particularly favorable time. While that may have been the case still I think the splendid success we had in finding plants new to that region was largely due to the fact that most of our collecting was done along the shore-line with the help of a cayuga (dug-out canoe), which was provided by the laboratory.

The difficulties of collecting in a tropical jungle have long been recognized and with good reason. The very tall trees are much interlaced with vines, and flowers or fruits are almost always inaccessible. When fallen specimens are available it is difficult to know certainly whether they are from one of the tall trees or from a vine which the tree supports.

Barro Colorado Island was cut off from the mainland when the valley surrounding it was flooded to a depth of eighty-five feet to form Gatun Lake and the channel of the Panama Canal.

Since the inundation was of very recent date, no littoral or shore-line vegetation has been formed and the mid-forest types which are almost inaccessible in the interior of the jungle very often overhang the shore with flowers and fruit being borne on the lower branches.

The many long, branched inlets allow a large part of the island to be explored from the shore.

Barro Colorado Island does have on it a most unusual collection of native Central American plants, and without doubt many of them are yet not listed as being present there.

The added feature of the accessibility of the flora makes it unique among tropical floras and speaks well for the foresight of the founders of the Institute of Tropical Research which is situated there.

WALTER N. BANGHAM
GOODYEAR PLANTATIONS COMPANY,
SUMATRA

[1] Paul C. Standley, *Jour. Arnold Arboretum*, April, 1930.