than 34 hours, and after 12 hours in about 20 hours. In the receiver charged for 12 hours, however, the pressure fell from 75 to 50 lbs., so that no difference worthy of note may be seen as between this and the corresponding experiment for 45 lbs. The difference in effect of the 6 and 9 hour exposures was very small with both 45 and 75 lbs. pressure, a fact which I am unable to elucidate. Aside from this, the period required for becoming nonastringent was, roughly speaking, in inverse ratio to the time of exposure to the gas. It will be readily understood by those who have worked with such objects as ripening fruits that it is often difficult to fix upon a suitable indicator of the final limit of any of the physiological processes involved. Thus, in these experiments just described, the difference in rate of change in green and orange-colored fruits makes it difficult to decide on what is to be regarded as the final point at which nonastringency ensues. Furthermore, there is the more variation between different fruits the longer the period of ripening, and the end point is correspondingly difficult to fix.

I have, therefore, endeavored to apply a test different from that of tasting, at least for purposes of control. The mucous membranes are of course extremely sensitive; nevertheless, it becomes difficult, as the end point is approached, to judge clearly. It is furthermore of the highest importance to examine the physical characters of the tannin-mass, which has been shown to be a colloidal complex,[5] in order to determine whether the condition reached by it when nonastringency has been accomplished quickly is identical with that reached after a slow process. A former study of the reaction of alkaloids[8] with the tannin-mass showed me that as nonastringency is approached, the coarsely granular precipitate gives way to an increasingly finer one, so that an ultramicroscopic and eventually an amicroscopic suspensoidal condition is reached. The only change obvious on applying the reagent then becomes one of color, the tannin-mass becoming brown, lighter brown, darker and paler yellow as the definitive state is approached. By reflected light the changes are evident as a decreasing milkiness.[9] By correlating these progressive changes with the disappearance of astringency, it has become evident that it is quite possible to decide whether a fruit is astringent or not without tasting it. This is because the physical condition of the tannin-mass is the same on the arrival of nonastringency, whether this has been accomplished in 15 hours or as many days.

There remains one further point of which to speak. When one uses such an expression as "the period required to become nonastringent," an incorrect notion may be implied. It is not to infer that in one case the process itself is slow and in another rapid (though this may be the case), but that the time required to start the process may differ. It remains to determine the actual fact, and this is necessary to an understanding of the whole matter.

Note.—The work, of which the above is a partial account, was done at the Alabama Agricultural Experiment Station as an Adams Fund Project. I have to thank Dr. F. A. Wolf for hearty and arduous cooperation in carrying on the experiments.

Francis E. Lloyd

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[8] Lloyd, F. E., "The Tannin-colloid Complexes in the Fruit of the Persimmon," *Biochemical Bulletin*, 1: 7, September, 1911.

[9] These changes are analogous to those seen first by Loew and others, and recently described in detail by Czapek. Czapek, F., "Ueber Fällungsreactionen in lebenden Pflanzenzellen und einige Anwendung derselben," *Ber. deut. bot. Ges.*, 38: 147–159, 1910.

THE AMERICAN PHYSIOLOGICAL SOCIETY

The society held its twenty-fifth annual meeting in Cleveland, Ohio, December 29, 1912, to January 1, 1913. Sixty-nine members were in attendance. Two executive sessions and six scientific sessions were held, two of the latter being joint sessions, one each with the American Society of Biological Chemists and Section K of the American Association for the Advancement of Science. The joint session with the American Society of Biological Chemists was opened with exercises in memory of the late Waldemar Koch. After the

members of the society had arisen as a token of respect to the memory of Dr. Koch, Dr. A. P. Mathews delivered the memorial address.

The following papers and demonstrations, forty-seven in all, were read and discussed:

S. Simpson: "The Rate of Growth in the Dog."

G. N. Stewart: "Further Observations on the Blood-flow in Man."

J. A. E. Eyster and W. J. Meek: "Experiments on the Sinus Region of the Mammalian Heart."

G. C. Robinson (by invitation) and J. A. Auer: "Cardiac Anaphylaxis as Shown by the String Galvanometer."

W. T. Porter: "The Functional Relations of Cells in Nerve Centers."

R. S. Lillie: "Correlation between the Anti-stimulating Action and the Anti-cytolytic Action of Anesthetics."

E. B. Meigs: "Studies in the General Physiology of Smooth Muscle."

W. P. Lombard: "The Tickle Sense."

O. Folin, W. B. Cannon and W. Denis (by invitation): "A New Colorimetric Method for the Determination of Epinephrin."

J. Auer and S. J. Meltzer: "The Splanchnic as a Depressor Nerve."

F. R. Miller: "The Salivary Secretion Centers in the Medulla."

W. T. Porter: "A New Electrical Clock."

S. P. Beebe: "A New Form of Apparatus for Artificial Respiration."

A. D. Hirschfelder: "Some New Apparatus."

L. Loeb: "The Influence of Pregnancy on the Cyclic Changes in the Uterus."

G. Lusk: "Metabolism of a Dwarf."

H. S. Gasser (by invitation) and A. S. Loevenhart: "The Mechanism of Stimulation by Oxygen Want."

T. B. Osborne and L. B. Mendel: "Feeding Experiments Relating to the Nutritive Value of the Proteins of Maize."

A. J. Ringer: "The Fate of Fatty Acids in Diabetic Organisms."

A. B. Macallum and W. R. Campbell: "On the Secretion of Pure Acid by the Kidney" (with demonstration).

D. Marine: "Hypertrophy and Hyperplasia of the Parathyroid in Birds."

G. H. Whipple: "Hematogenous Jaundice and its Relation to the Liver."

E. V. McCollum: "The Influence of the Plane of Protein Intake on Nitrogen Retention in the Pig."

R. S. Hoskins: "Relation of Fatigue Metabolites to Epinephrin Efficiency."

D. R. Hooker: "Perfusion of the Respiratory Center in Frogs; the Influence of Calcium and Potassium on the Respiratory Rhythm."

A. Hunter: "The Nitrogen Excretion of Normal and of Thyroidectomized Sheep."

A. L. Tatum (by invitation): "Studies in Experimental Cretinism with Suggestions as to a Biological Test for Thyroid Secretion."

R. A. Gesell (by invitation): "The Relation of Pulse Pressure to Renal Secretion."

C. Brooks and A. B. Luckhardt: "The Arterial Blood Pressure during Vomiting."

T. Sollmann and J. D. Pilcher (by invitation): "The Effects of Aortic Compression on the Circulation."

E. G. Grey (by invitation) and A. D. Hirschfelder: "Clinical Observations upon the Carbon Dioxide Percentage of Alveolar Air."

C. W. Greene and W. Y. Skaer (by invitation): "On the Fat Contents of the Mammalian Gastric Glands in Relation to the Stages of Digestion."

S. Tashiro (by invitation): "The Chemical Change in Nervous Tissue during Excitation."

I. F. Zucker (by invitation): "The Pressor Property of Shed Blood."

H. Cushing, L. H. Weed (by invitation) and C. Jacobsen: "Further Studies on the Rôle of the Pituitary Gland in Carbohydrate Metabolism, with Special Reference to the Autonomic Control of the Posterior Lobe Secretion."

S. A. Matthews and D. D. Lewis (by invitation): "The Pars Intermedia; Its Place in Diabetes Insipidus."

Lydia M. Degner (by invitation) and A. E. Livingston (by invitation): "Effects of Thyroidectomy and Castration, respectively, on the Pituitary in the Rabbit."

P. W. Cobb and L. R. Geisler (by invitation): "The Influence on Foveal Vision of the Brightness of Surroundings."

D. E. Jackson: "Some Observations on the Peripheral Action of certain Drugs."

G. L. Kite (by invitation): "The Relative Permeability of the Surface and the Interior Portions of the Cytoplasm of Animal and Plant Cells."

J. D. Pilcher (by invitation): "The Excretion of Nitrogen Subsequent to Ligation of Successive Branches of the Renal Arteries."

W. E. Burge: "The Uniform Rate of Destruc-

and Surgeons; H. G. Barbour, Yale Medical tion of Ptyalin and Pepsin by the Electric Current.''

G. H. Whipple: ''Intestinal Obstruction; Study of a Toxic Substance Present in the Intestinal Mucosa.''

S. J. Meltzer: ''Is the Pulsation of the Anterior Lymph Hearts Responsible for the Action of some Drugs in Cardiectomized Frogs?''

H. McGuigan: ''The Synergic Action of Morphine and Strychnine.''

Symposium: ''Some Recent Applications of Physical Chemistry in Biology.''

(*a*) A. B. Macallum: ''Surface Tension.''

(*b*) L. J. Henderson: ''The Control of Neutrality in the Animal Body.''

The following eleven papers were read by title:

C. D. Snyder: ''The Influence of Temperature on the Mammalian Heart.''

M. Dresbach (by invitation): ''A Bloodless Method of Recording Blood Pressure in Animals.''

A. J. Carlson: ''Some Observations on the Physiology of the Empty Stomach and Esophagus in Man and Dog.''

H. C. Bradley: ''The Problem of Enzyme Synthesis.''

G. W. Crile: ''The Relation between the Physical State of the Brain Cells and Brain Functions —Experimental and Clinical.''

Y. Henderson and C. T. Flynn (by invitation): ''Oligemia in Acute Disease.''

H. McGuigan: ''The Secondary Depression by Epinephrin; the Rate of Destruction of the Pressor and the Hyperglycemia Actions of Epinephrin.''

W. B. Wherry (by invitation): ''On the Transformation of Amebæ into Flagellates and Vice Versa.''

P. E. Howe (by invitation) and P. B. Hawk: ''The Influence of Fasting on the Creatine Content of Muscle.''

C. D. Snyder: ''A Study of the Electromyograms.''

A. J. Carlson: ''The Correlation of the Physiological States of the Thyroid of the Fetus and of the Mother.''

The following persons were elected to membership in the society: G. C. Robinson, Rockefeller Institute; J. D. Pilcher, P. J. Hanzlik, R. S. Pearce, Western Reserve Medical School; G. C. Schneider, Colorado College; A. H. Ryan, University of Pittsburgh; M. Dresbach, Cornell University; G. Bachmann, Atlanta College of Physicians School; W. B. MacNider, University of North Carolina; A. R. Moore, University of California; H. B. Williams, Columbia University; V. H. K. Moorhouse, Washington University.

At this meeting considerable progress was made toward the formation of a close federation of the American Physiological Society, the American Society of Biological Chemists and the American Society for Pharmacology and Experimental Therapeutics. The society expressed its desire to enter into such a federation, and a committee was appointed to confer with similar committees of the sister societies with a view to bringing it about. The committee was granted power to make the arrangements for the next annual meeting. This committee was also directed to confer with a similar committee of the American Society of Naturalists to consider the advisability of establishing closer relations with that society.

With regard to the measures of remedying the threatening congestion of programs that were referred to the council at the last annual meeting, it was decided that should the federation of the three societies be accomplished, the secretaries of the federated societies be empowered to attempt the equalization of the programs of the three societies by placing papers on the program of the society to which its subject is most closely related. It was also decided to place at the end of the program papers presented by non-members, and in the event of congestion of the program, to read these by title.

The following officers were elected for the year 1913:

President—S. J. Meltzer, New York.

Secretary—A. J. Carlson, Chicago.

Treasurer—Joseph Erlanger, St. Louis.

Additional Members of the Council—W. B. Cannon, Boston; F. S. Lee, New York.

The following members of the society were appointed by the president to form the editorial committee on the publication of the *American Journal of Physiology* for 1913: A. T. Porter, A. J. Carlson, Joseph Erlanger, W. H. Howell, F. S. Lee, Graham Lusk, S. J. Meltzer.

The local committee on entertainment, following the plan that was first tried last year at Baltimore by the members and friends of the society, again agreed to dispense with all private entertainment, and to substitute for it informal subscription dinners followed by smokers each evening while the society was in session. These functions were open to all members and guests of the societies of the experimental biological sciences. It was again

demonstrated that this method of entertainment, by bringing all of the members together under conditions permitting of informal discussion and exchange of ideas, adds greatly to the pleasure and value of the meeting.

JOSEPH ERLANGER,
Acting Secretary
WASHINGTON UNIVERSITY MEDICAL SCHOOL

THE ASSOCIATION OF AMERICAN GEOGRAPHERS

THE Association of American Geographers held its ninth annual meeting at New Haven, Connecticut, December 27–28, 1912. The sessions were held in Lampson Hall, Yale University, and an informal meeting took place Friday evening at the Graduates' Club. In the absence of the president (Professor Salisbury), Mr. M. R. Campbell, the first vice-president, presided. About thirty members attended.

It is gratifying to the members to see the increasing number of papers on anthropogeography, regional geography, and climatology that deal with human relations, a feature less prominent in the earlier programs of the association. Seven purely physiographic papers were presented out of a total of sixteen. Great interest is manifested in the *Annals* of the association since the appearance of the first volume during the past year. The publication committee has performed a distinct service to geographic science in securing papers of high quality and a volume of excellent appearance.

The newly-elected officers for 1913 are as follows:

President—Henry G. Bryant.
First Vice-president—Ellsworth Huntington.
Second Vice-president—Charles C. Adams.
Secretary—A. P. Brigham.
Treasurer—F. E. Matthes.
Councillor (for three years)—R. DeC. Ward.

The publication committee appointed for two years (1913 and 1914) consists of R. E. Dodge, editor, and Alfred H. Brooks, H. E. Gregory and H. H. Barrows.

ISAIAH BOWMAN,
Acting Secretary, Session of December, 1912

THE CONVENTION OF THE AMERICAN SOCIETY OF AGRICULTURAL ENGINEERS

THE sixth annual convention of the American Society of Agricultural Engineers was held at the Great Northern Hotel, Chicago, December 26, 27 and 28. The attendance of members was very good, but the noticeable feature this year was the unusually large number present of manufacturers, designers, etc. This is very encouraging to the officers and shows that the work of the society is being kept practical enough to interest the commercial man.

Thursday afternoon was devoted largely to general agricultural machinery interests. Mr. Sjogren, of the University of Nebraska, presented a paper on "Tests of Corn Planters," which gave the results of a series of tests run on accuracy of drop. Professor C. A. Ocock, of the University of Wisconsin, in his paper on "Draft of the Plow," showed by tables and curves, the variations in the draft of a plow as affected by width, depth, type of moldboard and condition of soil. In the paper on "Isolated Gas-lighting Plants" Mr. Eugene Becker, of the Atlantic Blau-Gas Company, described the different systems using gasoline gas, acetylene and Blaugas, with the advantages and disadvantages of each. Admixture of a certain proportion of air made either of these gases explosive, either a richer or leaner mixture being non-explosive: gasoline—2 per cent. to 5 per cent. by volume of gasoline vapor—98 per cent. to 95 per cent. air; acetylene—2 per cent. to 49 per cent. by volume acetylene—98 per cent. to 51 per cent. air; Blaugas—4 per cent. to 8 per cent. by volume Blaugas—96 per cent. to 92 per cent. air. Thus acetylene has a very wide explosive range, Blaugas next, and gasoline least. On the point of quality of light, acetylene is the best, but for convenience and safety Blaugas was probably most satisfactory.

Friday was devoted to the tractor and standardization questions. In his paper on "Testing of Gas Tractors" L. W. Chase, of the University of Nebraska, reviewed the results secured through the Winnipeg Motor Contests. C. F. Hirschfeld, of Cornell University, in a paper on "Principles of Fuel Oil Engines" explained the matter of carburetion of various fuel oils, the principles and chemistry of their combustion and the difficulties met in adapting them as fuels for internal combustion engines. E. H. Ehrman, of the Chicago Screw Company, in his paper on "The Standardization Work of the Society of Automobile Engineers," gave the society an account of the methods and guiding principles for the standardization work of his society. The influence of standardization in cheapening production and repairs and in keeping down monopoly was brought out in