no fibrin ever appeared, but if a smaller relative amount were used the clotting was delayed, but the fibrin filaments finally appeared, thus resembling the action on fish blood.

For all of the experiments, the dark-field microscope was used. In this way the minutest amount of fibrin could be detected. The action was tested upon human blood from many different racial stocks —English, Norwegian, Dutch, Hebrew, etc. The action was uniform in all cases.

There was one striking difference between the action of the buccal-gland secretion of the lake lamprey (Petromyzon marinus unicolor) and that from Lampetra and Entosphenus. With the lake-lamprey secretion the human red corpuscles were prevented from forming rouleaux, but with the secretion from Lampetra and Entosphenus, the red corpuscles did form rouleaux although the fibrin formation was prevented as with the lake-lamprey secretion. In this respect, the Lampetra and Entosphenus secretion resembled the action of the sample of hirudin from the leech with which we experimented.

It is hoped that a full account of the development and structure of this interesting organ and the action of its secretion can be published with full illustrations in the near future.

SIMON H. GAGE
MARY GAGE-DAY

CORNELL UNIVERSITY

EQUATION OF ELECTRONIC CONDUCTION IN UNI-POLAR NON-METALLIC FILMS

THE equation for variation of current flowing through a uni-polar non-metallic film due to electronic conduction when the film is in intimate contact with a metal can be derived by the use of Poisson's potential equation, in a manner similar to the method used by Langmuir (*Phys. Rev.* 1913, II, p. 453; *Gen. Elec. Rev.* 1915, p. 330) in studying the effect of the space charge on the emission of electrons from hot filaments.

In the simple case of an infinite plane emitting surface and an infinite parallel conducting plane, we have from Poisson's equation

$$\frac{d^2E}{dx^2} = -4\pi\varrho \qquad (1)$$

where E is the potential due to the space charge at point x along a line perpendicular to the planes, and ϱ is the volume density of the space charge. Consider a current flowing from the metal through the film in such intimate contact that electrons emitted from the surface of the metal penetrate into the film. If the concentration of free electric carriers in the non-metallic film is normally so small that it can be neglected, then at the boundary between metal and film we can then write $E = 0$, so that, neglecting any initial velocity of electrons emitted from the surface of the metal, we can write for the kinetic energy,

$$\frac{1}{2}mV^2 = Ee \qquad (2)$$

where m is the mass of an electron, e is its charge, and V is its velocity under the point potential, E. The current, I, flowing through the film can be written as

$$I = V\varrho A \qquad (3)$$

where A is the area of the film. Eliminating V in these equations and substituting in Poisson's equation to eliminate ϱ we obtain

$$\frac{d^2E}{dx^2} = \frac{4\pi I}{A}\sqrt{\frac{m}{2Ee}} \qquad (4)$$

the space charge, ϱ, being taken as negative on account of the negative charge of the electron. Integrating this equation subject to $\frac{dE}{dx} = 0$ when $E = 0$ gives

$$\left(\frac{dE}{dx}\right)^2 = \frac{8\pi I}{A}\sqrt{\frac{2mE}{e}} \qquad (5)$$

Integrating a second time, and solving for the current, we have finally,

$$I = \frac{A}{9\pi}\sqrt{\frac{2e}{m}}\,\frac{E^{3/2}}{x^2} \qquad (6)$$

Considering the flow of current in the opposite direction, *i.e.*, from film to metal with which it is in intimate relation, the emission of electrons from the film contact electrode is very feeble; first, because the two are not in intimate relation, and second, because of its reluctance to part with electrons. In this case the same form of equation as given in (6) will hold.

Insufficient data are available to verify the coefficients of equation (6). Furthermore equation (2) holds only for film thicknesses less than the mean free path of the electron so that collisions do not affect the velocity of the electron. It is therefore best to write the equation in the form

$$I = kE^{3/2} \qquad (7)$$

for given dimensions of the film and for a given temperature. The constant, k, may then be determined empirically.

The form of equation (7) may be tested from data obtained experimentally by Grondahl (*Jour. A. I. E. E.*, March, 1927, p. 216), who has made measurements on the current flowing in both directions through a copper oxide film on a copper disk. The observed values of I_1 and I_2 are compared with

those calculated from equation (7) when $k_1 = 1.79$ and $k_2 = .00017$.

	Observed		Calculated	
E	I_1	I_2	I_1	I_2
0	0	0	0	0
0.5	0.7	.0001	0.64	.000063
1.0	1.8	.0002	1.79	.00017
2.0	5.2	.0005	5.06	.00048
3.0	9.0	.0008	9.30	.00088
4.0	14.0	.0012	14.3	.00136

The agreement is about as good as can be expected on account of the error in reading the observed values of the current from a small scale curve.

The derivation of these equations have been based upon the theory of this phenomenon suggested by Grondahl (SCIENCE, Sept. 24, 1926, p. 306).

FRANK M. GENTRY

THE NEW YORK EDISON CO.,
NEW YORK, N. Y.

THE AMERICAN CHEMICAL SOCIETY

MEETING OF THE COUNCIL

THE Council of the American Chemical Society, President George D. Rosengarten presiding, and with 120 councilors in attendance, met at Detroit on the afternoon of September 5.

The section of history of chemistry having held successfully the six meetings prescribed by the council petitioned that it be made a division of the society and this request was granted and the by-laws submitted approved. New by-laws presented by the division of chemistry of medicinal products were also approved. A proposal that a section of chemical economics should be organized was discussed and without formal vote referred to the division of industrial and engineering chemistry, under the auspices of which symposia will be held to determine interest in the subject.

A. B. Lamb, of Harvard University, was reelected editor of the *Journal* of the society, and associate editors Roger Adams, of the University of Illinois, and E. W. Washburn, chief chemist of the Bureau of Standards, Washington, D. C., were reelected members of his board. E. J. Crane, Ohio State University, was reelected editor of *Chemical Abstracts*, and H. E. Howe, of Washington, editor of *Industrial and Engineering Chemistry*. W. A. Noyes, of Urbana, Ill., was reelected editor of the *Scientific Series of Monographs*, and H. E. Howe, editor of the *Technologic Series*. F. A. Lidbury, of Niagara Falls, N. Y., A. D. Little, Cambridge, Mass., and C. E. K. Mees, of Rochester, N. Y., were reelected to the technologic monograph board. H. S. Taylor, of Princeton, and W. A. Patrick, of Johns Hopkins University, were elected as society representatives on the editorial board of the *Journal of Physical Chemistry*. William McPherson, of Ohio State University, was reelected a member of the society's executive committee.

The president of the society having been asked to lend his name to the national committee being organized to secure the financial participation of the United States in the erection of a Maison de la Chimie in Paris in commemoration of the centenary of the birth of Marcelin Berthelot in which memorial building is intended to house the international office of chemistry. the formation of which is to be undertaken through diplomatic channels next May, the president called upon the secretary to read the papers in the matter and to give the history of recent movements looking toward the creation in one of the capitals of Europe of international control of chemistry. Following the complete statement which included the request of the president for advice from the society's executive committee, the following was presented for the council's action:

President George D. Rosengarten, of the American Chemical Society, having asked counsel of his advisers regarding a communication from M. Maurice Leon, vice-chairman of the "American Organization Committee for American Participation in a Maison de la Chimie" requesting the use of his name as a member of the committee, the executive committee of the Society unanimously advise him to decline for the reason that his acceptance would tacitly commit the American Chemical Society to a project it can not approve.

The American Chemical Society is glad to honor the name and accomplishments of Marcelin Berthelot and in evidence thereof has appointed two of its own past presidents to represent it at the centenary celebration on October 25, 1927. An international "Maison de la Chimie" and "An International Office of Chemistry" nationally conceived with predetermined control and location in Paris is an entirely different matter to which the American Chemical Society can not give its adherence, even though it has been connected with so eminent a name as Berthelot to insure its success.

The American Chemical Society has naught but good wishes for the "Chemists' Club" of New York, the long considered "House of Chemistry" of Great Britain, the "Hofmann House" of Berlin, or for a national "Maison de la Chimie" to be located in Paris and would be glad to see any of its members, who are so inclined, contribute to their support. It can not, however, admit the propriety of any national group assuming the right to centralization of control of international chemistry within its own territory and sphere of influence, even if the major costs of construction and upkeep of such an institution were not assessed upon the rest of the world.

The American Chemical Society believes that if an International Office of Chemistry, having as its object