inert chemical substances, such as the passage of sugars through the intestines or of urea through the kidney. But no decided changes in the molecules seem necessary. The conditions in the membrane cells may be favorable for weakly combined synthetic derivatives with the right solubilities. When we realize how susceptible to small differences in salts the membranes are, it is not impossible that some particular salt of the passing substance may be all that is necessary to determine its ready exit. If all other ideas fail in any given case, one can always fall back on the ever-ready help of the all-pervasive enzyme.

Several other writers have stated that these selective membranes behave as though a genie stood at the opening in the membrane, allowing the molecules from the side of lower concentration to pass, while closing the door to those moving in the opposite direction. It is evident that a space in which the proper chemical reaction occurs, and which is situated between the two different membranes with the proper permeabilities, functions like our anthropomorphic genie.

It is rather apparent that the idea outlined above is about half way between that of ordinary permeability and secretion. Though it does have many points in common with secretion, it seems wise not to confuse the two; for it is clear that they are different in the purpose served as well as in the method of obtaining their results.

If the attention is confined to the isolated system, solution one, the cell membrane as a whole, and solution two with concentration greater than solution one, the law of the conservation of energy is not obeyed. This might be urged as evidence of vitalism. But closer scrutiny will show that the necessary energy to run this system comes from outside. The substance necessary for the chemical reaction has to be formed and sent to the proper place. If this substance is derived from solution *two* directly, energy equivalent to that produced in the combination must be supplied to dissociate the complex. And energy is necessary to transport this substance back again to the permeability cell. Energy is also consumed in maintaining the cell structure. Even in a living organism one hesitates to start a perpetual motion theory, partly because it is such a lazy way of settling a difficulty, and partly because it would necessitate a later disillusionment.

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THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

SECTION B

THE section convened at Pittsburgh at 10 A.M., December 27, 1917, in Room 209 of the School of Applied Science, Carnegie Institute of Technology. Its sessions, jointly with those of the American Physical Society, extended over a period of three days. The scientific papers presented under the auspices of the American Physical Society are as follows:

"The optical properties of rubidium," by J. B. Nathanson, Carnegie Institute of Technology.

"A preliminary study of the luminescence of the uranyl salts under cathode ray excitation," by Frances G. Wick, Vassar College, and Louise S. McDowell, Wellesley College.

"Note on a phosphorescent calcite," by E. L. Nichols and H. L. Howes, Cornell University.

"The visibility of radiation in the blue end of the visible spectrum," by L. W. Hartman, University of Nevada (communicated from the Nela Research Laboratory, Cleveland).

"An improved form of mercury vapor air pump," by Chas. T. Knipp, University of Illinois.

"Heat conductivity of cerium," by C. N. Wenrich and G. G. Becknell, University of Pittsburgh.

"Temperature and heat of fusion," by J. E. Siebel, Chicago.

"Report on the construction of certain mathematical tables," by C. E. Van Orstrand, U. S. Geological Survey, Washington, D. C.

"Mobilities of ions in vapors," by Kia-Lok Yen, University of Chicago.

"The size and shape of the electron," by Arthur H. Compton, Westinghouse Lamp Company.

"The coefficient of emission and absorption of photo-electrons from platinum and silver," by Otto Stuhlmann, Jr., University of Pennsylvania.

"Ionization and excitation of radiation by electron impact in nitrogen," by Bergen Davis and F. S. Goucher, Columbia University.

"Energy in continuous X-ray spectra," by C. T. Ulrey, Columbia University.

"An experimental investigation of the characteristic X-ray emission from molybdenum and palladium," by Benjamin A. Wooten, Columbia University.

"Characteristic X-ray emission as a function of the applied voltage," by Bergen Davis, Columbia University.

"A standard of sound" (demonstration), by Chas. T. Knipp, University of Illinois.

"The air damped vibrating system: theoretical calibration of the condenser transmitter," by I. B. Crandall, American Telegraph and Telephone Company and The Western Electric Company.

"A photographic method of measuring the velocity of sound waves near the source of sound," by Arthur L. Foley, Indiana University.

"The effect of intensity and distance on the velocity of sound," by Arthur L. Foley, Indiana University.

"The influence of the pressure and time employed in condensing a dental amalgam upon its crushing strength, at temperatures between 10° and 100° C.," by Arthur W. Gray and Paris T. Carlisle, The L. D. Caulk Company.

"Absorption in paraffined paper condensers," by L. Pyle, Washington University, St. Louis.

"An interesting case of resonance in an alternating current circuit," by H. L. Dodge, The State University of Iowa.

"On electromagnetic induction and relative motion II.," by S. J. Barnett, Ohio State University.

"Eddy-current and hysteresis losses in iron at high frequencies," by C. Nusbaum, Harvard University.

"Some energy transformations with oscillatory currents," by E. F. Northrup, Princeton University.

"The effects produced upon audion characteristic curves by different kinds of signals (Buzzer Electron Relay and 60-cycle A. C.)," by A. D. Cole, Ohio State University.

"Influence of a series spark on the direct current corona," by S. F. Crooker, University of Illinois.

"On the effect of a magnetic field upon cathode rays," by L. T. More and Lowell M. Alexander, University of Cincinnati.

"The physical characteristics of X-ray fluorescent intensifying screens," by Millard B. Hodgson, Eastman Kodak Company.

"Barometric ripples," by W. J. Humphreys, U. S. Weather Bureau, Washington, D. C.

"The ultra-violet and visible absorption spectra of phenolphthaleins," by W. E. Howe and K. S. Gibson, Cornell University.

"The ultra-violet and visible absorption spectra of Orcinolphthaleins," by R. C. Gibbs, H. E. Howe and E. P. T. Tyndall, Cornell University.

"The ultra-violet absorption spectra of acetone," by E. P. T. Tyndall, Cornell University.

"Thermal conductivity of metals," by Edwin H. Hall, Harvard University.

"A mercury manometer of high sensibility," by J. E. Shrader, Westinghouse Research Laboratory, Pittsburgh.

"A simple gauge for very low pressures," by J. E. Shrader, Westinghouse Research Laboratory, Pittsburgh.

"Resonance and ionizing potentials for electrons in magnesium vapor," by P. D. Foote and F. L. Mohler, Bureau of Standards.

"The spectral photoelectric sensitivity of molybdenite," by W. W. Coblentz and W. B. Long, Bureau of Standards.

The papers by Messrs. Siebel, Foley, Crooker, More, Alexander and Coblentz were read by title.

On Saturday morning, December 29, at 10 A.M. the subject of discussion was "The relationship of physics to war." Addresses were made by Lieutenant G. P. Thomson, R.F.C., and by Lieutenant Giorgio Abetti, member of the Italian Military Mission. Informal reports upon the war activities of various laboratories were made by the following representatives:

Dr. A. L. Day, director of the Geophysical Laboratory.

Dr. I. B. Crandall, Research Laboratory of the Western Electric Company.

Dr. Frank Wenner, Bureau of Standards.

Mr. C. E. Skinner, Research Laboratory of the Westinghouse Manufacturing Company.

Dr. W. J. Humphreys, U. S. Weather Bureau.

The Sectional Committee announced the appointment of Professor C. T. Knipp, of the University of Illinois, to fill the vacancy on the sectional committee made by the withdrawal of G. W. Stewart.

The Section elected by ballot the following named persons:

For member of the Council: Professor Wm. Duane, of Harvard University.

For member of the Sectional Committee: Dr. H. D. Arnold, of the Research Laboratory of the Western Electric Company.

For member of the General Committee: Dr. H. S. Hower, Carnegie Institute of Technology.

G. W. Stewart,
Secretary