has been displayed in recent years. Most of the European nations which have possessions in Africa have sent scientific expeditions to that continent to study the insect-borne diseases. In the case of England, the Royal Society, the Imperial Bureau of Entomology, and the great schools of tropical medicine have sent such expeditions. As there has been an urgent demand from administrative officers and others for early information on the subject of African insect-borne diseases, many of the commissions and investigators have published preliminary or progress reports from time to time. The undertaking of the author of this book was to summarize and correlate as far as possible the findings of the different investigators which in many cases have not been harmonious. Dr. Hindle himself has conducted investigations in various parts of Africa and adds his own views to those of other investigators on points which are by no means settled.

The general plan of the work is to combine the necessary entomological and medical features of the problem so that the accounts of the different diseases will be complete. In the treatment of diseases borne by mosquitoes, for instance, a full discussion of the classification of the mosquitoes is given. This is followed by a series of chapters on the diseases such as malaria and yellow fever which these insects transmit. The completeness of the work may be judged from the table of the two hundred and forty-one species of anopheles, their classification and generic synonymy, and notes on their habitat and connection with malaria. Even with such complete special discussions the work is well balanced, but its chief characteristic is its inclusiveness and the good judgment the author has displayed in the exclusion of immaterial details.

Dr. Hindle lost his life in military operations in Africa, where he was continuing his investigations of tropical diseases, soon after the outbreak of the war. He was a young man and would undoubtedly have made further valuable contributions to the study of insect-borne diseases. But the present book may be considered a monument that will mark his place, which was an important one in the study of tropical diseases at a time when such work as his was much needed. W. D. HUNTER

SPECIAL ARTICLES

THE DIFFUSION OF GASES AT LOW PRESSURES MADE VISIBLE BY COLOR EFFECTS

AN interesting and instructive experiment for the lecture table is to connect a discharge tube *AC*, which is about one meter or more in length and which has the exhaust nipple at one end, to a pump that will give a Geissler vacuum—an oil Geryk pump will answer very well. Between the pump connection *M* and the valve *O* that closes the tube there should be fused a side branch *N* also having a valve. Connect *N* by a rubber tube to some source of gas other than air, *e. g.*, ordinary illuminating gas. The connection at *M* should be made direct to the pump. Connect *A* and *C* to the terminals of an induction coil that will give a spark in air five or more centimeters long.

To operate, close the valve in the branch *N*, open *O* and evacuate the discharge tube to the point where on sparking the characteristic striæ show distinctly. It is immaterial whether *A* or *C* is the cathode, or whether the discharge is unidirectional. Now close the valve *O*, and, with the pump still running, open *N* partly, allowing illuminating gas to be drawn by the pump through the branch *OM*, thus displacing the air by the gas. By closing *N*, pumping and later admitting more gas, every trace of air may be washed out of

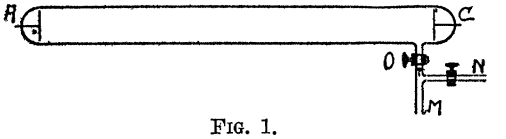

FIG. 1.

the tube leading up to *O*. Now with *N* closed allow the pump to run for a few seconds until it is judged that the pressure in the connecting tube *MO* is about that in the discharge tube *AC*.

At this stage everything is in readiness for the experiment, namely, the diffusion of gases at low pressures made visible by the color effect. The well-known characteristic color of the discharge in the case of residual air, con-

taining possibly some water vapor, is orange red. To now introduce the illuminating gas open the valve *O* for a moment, then close it. The end *C* of the discharge tube is instantly filled with a beautiful greenish-white color characteristic of illuminating gas. This color will diffuse slowly towards *A*, each color paling out, and after three or four minutes the discharge throughout the tube will assume a uniform grayish hue. The rate of diffusion is surprisingly slow and of course depends upon a number of factors, *e. g.*, the gas pressure in the tube, the pressure of the gas that is admitted, the ionization within the tube due to the discharge passing through the tube, the amount of moisture present, etc.

If now the gas connection at *N* be removed and this stem opened to the air the pump and connections may be freed of gas and the inverse experiment performed; namely, that of introducing a small quantity of air. The resulting orange red color and its diffusion through the grayish hue of the illuminating gas is even more striking than the first.

The success of the experiment depends largely upon the skill of the operator in properly proportioning the quantity of gas to be introduced. It is a very simple experiment to perform.

Chas. T. Knipp

Laboratory of Physics,
University of Illinois,
June 2, 1915

THE NEW ORLEANS MEETING OF THE AMERICAN CHEMICAL SOCIETY. III

Division of Physical and Inorganic Chemistry

G. A. Hulett, *chairman*
R. C. Wells, *secretary*

E. R. Weaver: *A Colorimetric Determination of Acetylene.*

A new colorimetric method for the determination of very small amounts of acetylene in gas mixtures depends upon the formation of a red colloidal solution of cuprous chloride containing gelatine and alcohol. Comparison is made with a solution of a red dye or a piece of ruby glass. In the gravimetric determination of acetylene it has been found necessary to exclude air during the filtration and washing of the precipitate.

George W. Morey: *The Ternary System K_2O-SiO_2H_2O from 300°–700°.* (Lantern.)

E. C. Franklin: *Rubidium Ammonosodate and Ammonopotassiate.*

R. S. McBride: *Experiments on the Distillation of Liquid Air in a Magnetic Field.*

Preliminary experiments on distillation of liquid air in a strong magnetic field indicate that there is an improvement in the separation of oxygen and nitrogen due to the influence of the magnetic field.

E. P. Schoch and Denton J. Brown: *A Systematic, Rapid, Electroanalytical Procedure for the Separation and Determination of Silver, Arsenic, Copper, Bismuth, Antimony, Tin, Lead and Cadmium.*

In our earlier work, published elsewhere, we have shown that copper, tin, lead, bismuth and antimony can be determined accurately by electrodeposition out of acidified chloride electrolytes which contain suitable reducing agents such as hydroxylamine or formalin. We have found since that copper, bismuth and antimony can be deposited simultaneously, and can be separated from tin and lead; that tin and lead can be deposited simultaneously and separated from cadmium; that copper or bismuth can be separated from antimony by dissolving alloys of these metals in nitric acid plus tartaric acid and electrolyzing the solutions with a limited cathode potential; that bismuth phosphate can be precipitated quantitatively out of the same solution; that tin may be separated completely from lead by dissolving an alloy of these two metals in nitric acid plus potassium nitrate; and that silver in silver chloride may be determined by dissolving the latter in ammonia, adding ammonium nitrate and electrolyzing.

These facts are all combined in the following systematic procedure for the rapid electroanalytical determination of all the common metals the potentials of which are more noble than that of cadmium.

(*A*) Dissolve sample in hydrochloric acid or in aqua regia; an insoluble residue—silver chloride—is dissolved in ammonia plus ammonium nitrate, and the silver determined electrolytically.

(*B*) Treat solution *A* with hydroxylamine—mercury, gold and platinum will be precipitated and can be determined by well-known methods.

(*C*) Out of filtrate *B*, remove arsenic by distillation with hydrochloric acid, and determine arsenic iodometrically.