NOTE ON THE DUST STORM OF NOVEMBER 13, 1933

ON the evening of Monday, November 13, 1933, a small amount of rain fell in the region around Philadelphia, accompanied by considerable amounts of fine dust. Automobiles exposed during the storm were uniformly soiled by this dust shower, and newspapers reported the condition wide-spread throughout the states of Pennsylvania and New York. Fortunately, the writer's automobile had just previously been thoroughly cleaned and, standing idle during the evening of November 13, collected a considerable quantity of this dust. The dust was carefully collected and weighed, giving 2.528 grams. The accompanying rain doubtless washed some of the dust from the car, and some of it was impossible to collect. Further, the car was partly protected by surrounding trees and buildings, so that the quantity that fell was probably at least twice the amount collected. The effective area of the car from which the dust was collected is 3.71 square meters. If it be assumed that five grams fell on this area, the rate is 1.35 grams per square meter, and if uniform over a larger area the rate is 3.86 short tons per square mile.

Microscopic examination showed that the dust is composed largely of mineral fragments, among which quartz, feldspars, calcite and biotite predominate in the order named, but including at least a dozen additional mineral species and particles of volcanic ash. Organic fragments in the form of the tests of diatoms and shreds of vegetable matter also occur. The grain sizes range from 0.0005 mm to 0.15 mm, although the greater part by weight of the material is included between grain sizes of from 0.01 to 0.1 mm.

Reference to the U. S. Weather Bureau's records for November 12 shows a marked barometric depression centering over the North Central States, on the western side of which, throughout Kansas, Nebraska, North and South Dakota, and north into Canada, strong northwest winds were blowing into the depression with velocities of from 30 to 50 miles an hour. These velocities were maintained by west and northwest winds during November 13 across the Central States, as the depression moved eastward, reaching the Atlantic Seaboard about 10 P. M. on November 13.

EDWARD H. WATSON

DEPARTMENT OF GEOLOGY
BRYN MAWR COLLEGE

REPORTS

THE ELLA SACHS PLOTZ FOUNDATION FOR THE ADVANCEMENT OF SCIENTIFIC INVESTIGATION

DURING the tenth year of the Ella Sachs Plotz Foundation for the Advancement of Scientific Investigation, one hundred and thirty-six applications for grants were received by the trustees, sixty-two of which came from thirteen different countries in Europe and Asia, the other seventy-four from the United States. The total number of grants made during this year was twenty-one, one of these being a continued annual grant. Twelve of the new grants were made to scientists outside of the United States.

Due to economic conditions and the fact that many very worthy scientists are without positions at the present time, about one third of the money appropriated this year was kept in reserve to aid these men.

In the ten years of its existence the Foundation has made two hundred grants, and investigators have been aided in Argentina, Austria, Belgium, Chile, China, Czechoslovakia, Estonia, France, Germany, Great Britain, Hungary, Italy, Latvia, Netherlands, Palestine, Poland, Portugal, Roumania, South Africa, Sweden, Switzerland, Syria and the United States.

The list of investigators and the purpose of their researches aided in the current year is as follows:

Professor E. Aubel, Paris, France, $200 for study of the synthetic reactions of liver and their rôle in specific dynamic action.

Dr. J. Percy Baumberger, Stanford University, $300 for research on the difference between the oxidation-reduction processes in normal and malignant cells with particular reference to lactic and pyruvic acid.

Dr. S. J. Crowe, the Johns Hopkins Hospital, $300 for continuation of experiments on the physiology of the ear.

Professor Robert Debré, Paris, $300 for study of tuberculin allergy.

Dr. Ehrich Engelhart, Graz, $200 for study of the effect of transplanting anterior pituitary into rats, at the menopause, to bring back the ovarian cycle.

Professor H. Eppinger, Vienna, $300 for work on the breakdown products of fat which produce lesions which fit in with the pathology of wounds such as liver damage, and lesions of the kidney.

Professor C. Heymans, Ghent, $300 for continuation of researches on the circulation.

Professor Dr. Max Hochrein, Leipzig, $300 for work on the correlation of circulation, gas exchange and vasomotor disturbances.

Dr. H. A. Krebs, Cambridge, England, $350 for continuation of studies on the breakdown of protein in animals and on the metabolism involved in the action of insulin.

Dr. Fritz Lange and Dr. O. Bickenbach, Munich, $300 for study of the haemodynamic action of a new apparatus for dilating blood vessels and lowering the blood pressure in animals and man.

Dr. E. Lederer, Paris, $300 for continuation of work on carotinoids and vitamin H.

Dr. Perrin H. Long, the Johns Hopkins Hospital, $300 for continuation of studies on the biology of the Pertussis Bacillus.

Dr. Balduin Lucké, University of Pennsylvania, $200 for problems of cellular permeability.

Dr. David H. Marine, Montefiore Hospital, New York City, $250 for further study of exophthalmos.

Dr. E. V. McCollum, the Johns Hopkins Hospital, $300 for chemical and histological work on the relationship between hypophysis and magnesium.

Dr. S. W. Ranson, Northwestern University, $300 for work on the production of catalepsy in cats by making lesions behind the mammillary bodies.

Thorndike Memorial Laboratory, Boston City Hospital (Professor George R. Minot, director), continued since 1927 in recognition of Dr. Francis W. Peabody's services to this foundation.

Dr. Carl J. Wiggers, Western Reserve University, $300 for research on the dynamics of the coronary circulation.

Professor Richard Willstätter, Munich, $400 for continuation of research on enzymes, chiefly on amylases of leucocytes.

Professor René Wurmser, Paris, $300 for continuation of work on electrochemical equilibrium in the surrounding cells and its bearing on cellular metabolism.

Academic Assistance Council, London.

During the present emergency, grants (usually less than $500) will be given on the sciences closely related to medicine without reference to special fields. Applications for the year 1934 to 1935 must be in the hands of the committee by May 1. They should be sent to Dr. Joseph C. Aub, Collis P. Huntington Memorial Hospital, 695 Huntington Avenue, Boston, Massachusetts.

SCIENTIFIC APPARATUS AND LABORATORY METHODS

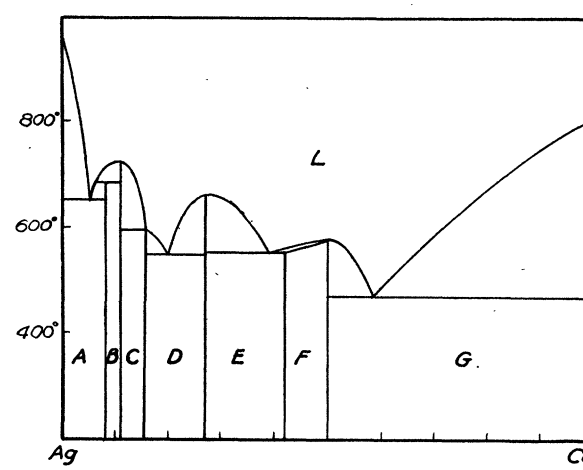
A RULE FOR THE INTERPRETATION OF MELTING POINT DIAGRAMS

To overcome the difficulty frequently encountered in the interpretation of melting point-composition diagrams of system of two components, the writer suggests the following rule, which has been found very useful in determining the number of phases present in a system represented by any given region of the diagram.

A horizontal line represents the conditions under which the coexistence of three phases is possible. Three regions of one phase touch the horizontal line at only one point each. Regions of two phases which touch the line are in extended contact with it.

In this discussion the phrase "one phase region" refers to the sum total of points which represent the temperatures and compositions for which the system consists of a single characteristic phase. Similarly, "two phase region" refers to points which represent temperatures and compositions for which the system consists of two characteristic phases. A one-phase region may be either an area or a vertical line; a two-phase region is always an area.

Application of the rule is illustrated in the accompanying figure. Many of the regions of such diagrams may be interpreted by means of an old rule, according to which those to the right and left of a one-phase region are of two phases, and similarly, those to the right and left of a two-phase region are of one phase. By this means, all the unlettered regions of the figure can be shown to be of two phases, for they are all either to the right or to the left of the one-phase liquid region, but the lettered regions are not so easily interpreted. Since only



areas and vertical lines can represent single phases, the upper left boundary of region F can not represent a phase, and hence the whole region F must represent one phase, and the regions G and E must therefore be two-phase regions. We are unable, however, by the use of this old rule, to determine whether D, C, B and A are alternately one, two, one and two-phase regions, or whether they are all two-phase regions, with the vertical bounding lines as the intervening one-phase regions. By the new rule, however, one can immediately see that all the lettered regions except F and L and all the unlettered areas are two-phase regions, because each is in extended contact with some horizontal line. The areas F and L and the vertical lines between the areas A and B, B and C, C and D and D and E, are one-phase regions, for each has single-point contact with one or more horizontal lines.