oratory of the Department of Physiological Chemistry.

Richard J. Block, of Scarsdale, N. Y., is carrying on a study of brain proteins in the laboratory of physiological chemistry. Robert O. Bengis, of New Haven, Conn., is studying the chemistry of coffee at the Sterling Chemistry Laboratory; Ebbe C. Hoff, of Lindsborg, Kans., is working on the finer structure of the nervous system and its correlation with nervous physiology, and Helen G. Richter, of New Haven, is making a pathological study of nervous tissues in dogs with a diet deficient in vitamin.

Sterling fellows are investigating the following subjects: Ernest Beaglehole, Wellington, New Zealand, cultural stratification in Polynesia; Robert M. Brick, Ventnor, N. J., at the Hammond Metallurgical Laboratories, grain boundaries as variables in solid equilibria relationships; John M. Bruhn, of Sioux Falls, South Dakota, at the Yale Anthropoid Experiment Station, the relation of basal metabolic rate to lesions in the cerebral cortex; Charles Burnham, of Fort Atkinson, Wis., meiosis in maize plants, and John R. Huffman, of West Haven, Conn., unimolecular homogeneous gas reactions.

Cecil T. Lane, of Montreal, is studying magnetism at the Sloane Physics Laboratory; Saunders MacLane, of Norwalk, Conn., is working in the mathematics department on the topology of algebraic systems, and Normal D. Newell, New Haven, Conn., is working at the Peabody Museum on a study of the late Paleozoic Pelecypode, of the United States.

The theory of electrolytes is being investigated in the Sterling Chemistry Laboratory by Lars Onsager, a Norwegian. Ernest C. Pollard, of Lincolnshire, England, is studying nuclear physics at the Sloane Physics Laboratory.

Julien A. Ripley, Jr., of Oyster Bay, N. Y., is applying scientific methods of research in the social sciences, particularly sociology; Daniel Raffel, of New Haven, Conn., is working at the Osborn Zoological Laboratory on the translocutions of parts of chromosomes of *Drosophila melanogaster* produced by x-rays; Otto L. Tinklepaugh, of New York City, is studying the relation of maturational factors to the social behavior of the chimpanzee and the macaque monkey; Harold Henderson Williams, of Howard, Pa., is studying the possible rôle of cholesterol in fat metabolism.

As Currier fellow in history, Bell I. Wiley, of Halls, Tenn., is collecting material in the South for a study of the Negro in the Confederacy. The new Indiana Fellowship in Anthropology is held by Charles F. Voegelin, of Berkeley, Calif., who is working in the field collecting material among the Shawnee Indians of Oklahoma. Two Bishop Museum fellows are working in the Islands of the Pacific. Albert C. Smith, of New York City, is making extensive botanical collections in a group of Polynesian Islands, and Laura M. Thompson, of Berkeley, Calif., is making an intensive ethnographical survey of the culture of one island in the Lau group.

REPORT OF THE TRUSTEES OF THE BANTING RESEARCH FOUNDATION

THE Banting Research Foundation has now been in active operation for six and a half years, though in the first two years the full capital sum was not available and the number of grants made were few. The capital sum now amounts to about $700,000 and the number of individual grantees has steadily increased. The total number of grants made during the period is ninety-two. These have been distributed to 63 workers in the following universities: Alberta 4, Saskatchewan 2, Dalhousie 8, Queen's 2, Western Ontario 2, Manitoba 16, McGill 26, Toronto 30 and 2 non-university. Some 50 papers have already appeared in scientific publications, while some 15 papers are in press or ready for publication. Several pieces of work are not as yet complete.

In accordance with its charter, the foundation also aids in the support of the Department of Medical Research (Dr. F. G. Banting) and from this source numerous papers have appeared, including ones dealing with the problem of silicosis and of the action of vitamins.

Important papers on the following subjects have been published during the past year by grantees: "On the Functioning of the Thyroid Gland" (A. C. Abbott, Manitoba), "Gastric Secretion" (A. M. Alley, McGill), "Anterior Poliomyelitis" (M. Brodie, McGill), "Addison's Disease" (M. M. Cantor, Alberta), "Fungous Diseases of the Skin" (A. M. Davidson, Manitoba), "Glycogen Metabolism" (G. T. Evans, McGill), "Thorium Oxide and the Reticulo-endothelium" (R. Gottlieb, McGill), "Urate Excretion" (H. C. Graham with E. G. Young, Dalhousie), "The Effect of Choline on Fat Metabolism" (J. M. Hershey and C. H. Best, Toronto), "The Fate of Lactic Acid in the Body" (F. L. Horsfall, Jr., McGill), "On the Function of the Lachrymal Gland" (P. R. McDonald, McGill), "A Study of the Histology of the Human Ovary" (D. Mainland, Dalhousie), "On Obstetrical Forceps" (J. Mann, Toronto), "Cholesterol Metabolism" (J. M. McEachren, Manitoba), "Urinary Antiseptics" (D. R. Mitchell and J. M. Scott, Toronto), "Action of Drugs on the Uterus" (R. A. Moreash and N. B. Dreyer, Dalhousie), "Serum Bilirubin" (F. D. White, Manitoba).

During the past year twenty workers received grants from this fund. The trustees feel assured that the

work done under the aegis of the foundation has been of real value and that the foundation, which is the only one in Canada lending its support to medical research, has proved a valuable aid and stimulus to such research in Canada. Like all such foundations, the depression has increased the demands upon it and a larger revenue could be expended with advantage.

VELYIEN E. HENDERSON
D. T. FRASER
Honorary Secretaries

SCIENTIFIC APPARATUS AND LABORATORY METHODS

A MICRO-MANIPULATOR FOR PURE CULTURE AND MICROCHEMICAL WORK

THE rapid selection of unicellular organisms for pure culture presents problems which differ so markedly from those involved in cell dissection, injection and aspiration that they require not only a different technique but, if a high ratio of success is to be achieved, changes from existing standards in the form and arrangement of parts of the manipulator itself.

To adapt my recently introduced micro-manipulator[1] to this line of work, I have made a number of changes in the standard form. The new instrument has proved in use not to be limited to the field of biology but to meet the demands of microchemical work. By the use of the pipette point as a test tube, it permits the rapid chemical analyses of particles of the order of 10^{-7} gm, and is therefore available for the convenient analysis of even the most valuable works of art.

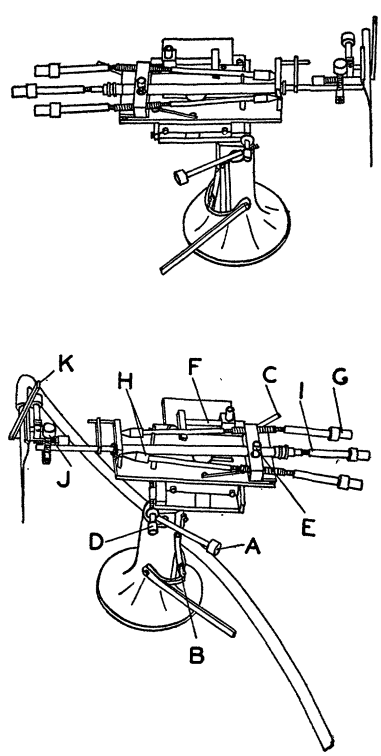

FIG. 1

The instruments as illustrated are arranged for the pipettes to enter the moist chamber from the front and to converge at the optical axis of the microscope. The pipettes are held at right angles to the MM shaft, that the grouped MM controls may be within instant grasp by the operator. When desired, the pipettes may be held parallel to the MM shaft, in which case the manipulators may be grouped on one side of the microscope.

The manipulator is supported by a pedestal and the vertical gross adjustment occurs within the hollow post of the pedestal through the up-and-down movement of the vertical stem of the supporting bracket. The bracket is set to the height of the microscope stage and its stem is grasped by a collar clamped by the long-stemmed screw A. The superimposed apparatus is raised and lowered through a range of one half inch by means of the lever B, which has a power ratio of 4 to 1. A coiled spring within the bracket stem supports the weight and permits a uniform control through the smooth resistance of polished metal on the graphite-lubricated felt friction rings of the bracket stem. The resistance is sufficient to hold any given position securely, yet instant adjustment may be made with smoothness and accuracy.

The shelf of the bracket supports a plate which glides between felt-lined guides attached to the bracket shelf, in the axial line of the pipette. It is actuated by lever C with a power ratio of 3 to 1 and has a range of 2 inches, that clearance may be given for the safe installation of the pipette. An adjustable stop D is attached to the shelf of the bracket and can be set when the point of the pipette is in the center of the field. When the pipette is moved away to install the moist chamber, its point can be instantly returned to its previous exact position in the field.

The plate in turn supports and controls the motion of a second plate by attached guides which permit said plate to move in the line of the axial shaft of the MM, *i.e.*, at right angles to the axial line of the pipette, through a range of 2 inches. This movement is directly actuated by pressure applied to stud E and can be limited in its centrally directed course by an adjustable stop F.

This second plate is the base of the MM proper

[1] G. W. Fitz, "A New Micro-Manipulator," SCIENCE, January 15, 1931, 72–5.