



NEW RESEARCH AID — A \$30,000 electron microscope has been given to Queen's University by the National Research Council, and will be used in medical research. A group of doctors are shown above grouped around the microscope in Queen's department of pathology. Left to right, standing are: Dr. G. F. Kipkie, Dr. Howard Steele, Dr. John Frei, Dr. Douglas

Waugh and Dr. R. M. More, department head. Seated is Dr. David M. Robertson. The microscope is being used at present to study changes in the kidney in various diseases and to study certain tumors. The electron microscope is a great forward step in the study of disease at the research level.

Major Aid to Research:

Electron Microscope Is Presented to Queen's

A \$30,000 electron microscope has been given to Queen's University by the National Research Council of Canada. The microscope while available for use of the scientific departments in the faculty of medicine will be under immediate direction of Dr. Robert M. More professor of pathology. It has been installed in the Richardson Pathological Laboratory.

The electron microscope is one of the most significant advances in medical research in the last 10 years. With the electron microscope a wealth of previously invisible detail can be seen and many problems of tissue structure that have been vexing anatomists and pathologists for 200 years can be answered.

The instrument utilizes a beam of electrons rather than light, and a series of electromagnets serve as lenses. It is able to visualize structures only 1/12,000,000 inch in diameter, and is capable of magnifications of 200,000 times as compared with 1,500 times of a good conventional microscope.

Prior to installation of this microscope members of the department of pathology had been using an older model at Royal Military College, and are well acquainted with the preparation of tissues and other problems related to electron microscopy.

The principal use being made of the electron microscope by members of Queen's Department of Pathology is in the study of diseases of the kidney. During the past year Dr. David M. Robertson, Dr. John V. Frei and Dr. M. Daria Faust have made a detailed study of the normal kidney, the fine structure of which cannot be seen with a light microscope. The results of this work

were presented recently at the meeting of the Ontario Association of Pathologists by Dr. Robertson.

The next and most important step is to study the changes in the kidney in various diseases; and this is being done at present by several members of the Department. Under the direction of Dr. More, Dr. Robertson is investigating a common form of Bright's disease which usually affects children.

It is thought by many that this condition develops as a result of allergy to various proteins, particularly those produced by certain bacteria. An apparently identical condition develops in certain animals when exposed to protein derived from other animals blood serum.

The evolution of this disease in animals is being studied in detail, and compared with the acute form of the disease in humans. If indeed they are found to be identical, it will do much to prove the allergic cause of the disease in humans, and thus offer a possible method of treatment and prevention.

A strange kidney disease seen only in rabbits, produced by the administration of cortisone, is being investigated. This disease bears a close resemblance to a form of serious kidney disturbance found in many cases of diabetes, especially those of long duration. Dr. John Frei, Dr. D. W. Robertson and Dr. M. D. Faust in association with Dr. S. A. Bencosme, previously at Queen's and now at the University of California, Los Angeles, are studying cortisone nephritis. It is hoped that some indication of the cause of this disease may be found, and its relation to dia-

betic nephropathy determined.

Dr. Douglas Waugh in association with Dr. T. Lee and Dr. M. Pearl is using the electron microscope to study the diseases in the kidney that develop when a person is seriously injured, burned, shocked, or given certain drugs and poisons. In these various states, a syndrome of kidney shut-down develops—the kidney tubules degenerate and urine formation ceases, often leading to death. A detailed study of these tubular changes may give some clue to their cause and perhaps to the reason the secretion of urine ceases.

The second group of projects for which the electron microscope is being used is the study of certain tumors, particularly those such as the common brown nevus, and the highly fatal variant, malignant melanoma, the origin of which is not known. By a detailed study of the structure of the cells composing these and other neoplasms, some insight may be gained into their nature

and biological properties. Dr. G. F. Kipkie and Dr. Frei are investigating these and related problems.

A potential use of the microscope, to be studied by Dr. H. D. Steele, is in the examination of various body secretions for evidence of malignant change. Diagnosis of cancer by examination of cells from the uterine cervix, the stomach, and the lung, has been highly developed in the last several years, and high accuracy in this field has been achieved with the light microscope. It is possible that with the electron microscope this accuracy may be further increased.

The applications of the electron microscope to these and other research projects are almost unlimited. A new concept of disease, based on changes at the molecular or near-molecular level, will gradually arise. The electron microscope is as great a step forward as the light microscope was 100 years ago.



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