highly fluorescent pigment, present in the cells which surround the so-called guard cells controlling the openings through which gases enter the leaves of certain species of vetch, possesses a fluorescence spectra resembling those of certain types of porphyrins. A mutant of *Chlorella* has been found which contains chlorophyll, but is incapable of reducing carbon dioxide, although it can evolve oxygen when illuminated. Chloroplast experiments have shown that the reactivation by precipitation of disintegrated chloroplast material depends primarily upon the physical state of the precipitate, and similar results have been obtained by treatment with various salts, by increased acidity, and by very low concentrations of streptomycin, which combines specifically with the chloroplast material. Methods have been worked out for separating uronides from leaves, and it appears possible that the great variations, independent of photosynthesis or respiration, of sugar concentration in leaves, may be associated with a reversible formation of uronides, which ties up the sugars. The principles controlling the evolution of plants have been studied by examining the growth of contrasting climatic races under varied temperatures in controlled greenhouses at the California Institute of Technology. The *Poa* grasses included with hybrids of *Achillea* and *Mimulus* in these studies were also used in studies of the influence of environment on chromosomal pairing.

In the Department of Embryology of the Carnegie Institution one of the chief advances on the anatomical side has been the achievement of sex reversal of the gonad in the opossum by experimental treatment in the embryonic stage with the female sex-hormone œstrogen. A detailed study of the embryonic development of the external muscles of the human eyeball was being prepared for publication, and studies on the developing brain and liver, with respect to chemical factors in the synthetic activities which characterize fœtal growth, indicate that specific chemical changes can be correlated with changes in the form of the developing nerve cells as seen under the microscope. The investigation on the physiology of the uterus has led to the development of the multi-channel tokodynamometer, by which obstetricians can record the contraction of all parts of the human uterus in childbirth and distinguish normal patterns of contraction from abnormal types which do not permit smooth and properly timed passage of the infant. Studies of the action of drugs upon the uterus were being continued, and an investigation of the biochemistry of uterine muscle in relation to the functional states of the reproductive system has shown that the presence of an effective amount of actomyosin in the uterus depends upon the ovarian sex hormone or œstrogen.

## TEA RESEARCH INSTITUTE OF EAST AFRICA

A NEW research institute concerned with problems bearing on the cultivation and manufacture of tea has been inaugurated at Kericho, Kenya Colony, to serve tea producers in the three East African territories. Well-equipped laboratories have been built and a nucleus staff is in residence. At present the activities of the Institute are divided between a general agricultural department, covering agronomic and pathological problems, and a chemical department concerned with soils and plant biochemistry.

The funds for the support of the Institute are provided by the territorial Tea Boards of Kenya, Tanganyika and Uganda, which were recently established by legislative ordinances for the regulation of tea production, marketing and export.

Following the example of the British Grassland Research Station, the Institute has been incorporated as a company limited by guarantee without share capital, in Kenya, thus obviating the necessity for parallel legislative action in three territories of different constitutional status.

The governing body consists of ten members, six of whom (two from each territory) are nominated by the Tea Boards to represent producers, the remaining four being the directors of agriculture in the territories and the director of the East African Agriculture and Forestry Research Organization. The latter, Dr. B. A. Keen, has been elected chairman. During the preliminary stages of establishment, pending the working out of a constitution, the affairs of the Institute were sponsored by Messrs. Brooke Bond and Co., Ltd. On this account buildings and development generally were able to proceed without delay.

The tea industry in East Africa is relatively young and dates back about twenty-five years. The approximate acreage of mature tea in East Africa is 33,000, with a production of 19,000,000 lb. in 1950. East Africa has contracted out of the international agreement for restriction, and production is expanding. The immediate problems for a research institute are therefore largely concerned with soil and fertility conservation, establishment of young tea and the improvement of types of tea by selection.

## DEVELOPMENT OF THE MAMMALIAN LYMPHATIC SYSTEM

By N. K. BALANKURA
Anatomy School, Cambridge

THE problem of the development of the lymphatic system in the mammal still remains unsettled. Sabin[1] regards the lymphatic vessels as direct derivatives of the embryonic veins. The lymphatic vessels make their first appearance at the four centres of radiation in relation to limb girdles. By the process of continuous and uninterrupted sprouting they extend centrifugally and invade almost the entire body. Lewis[2] believes that the lymphatic vessels are formed by the confluence of multiple venous outgrowths. These venous derivatives have previously become detached from the main venous channels and later they transfer *in toto* to the lymphatic system. Huntington[3], Huntington and McClure[4] and Kampmeier[5] have shown that the systemic lymphatic vessels are formed by fusion of the perivenous mesenchymal spaces. These spaces develop as separate lymphatic anlagen outside the intima of the early venous channels. They do not communicate directly with the veins except at definite points in the lymphatico-venous connexions which are secondarily formed. The connecting segments between the veins at the root of the neck and the proper systemic lymphatic vessels are provided by the paired jugular lymph sacs.