tional life where a central socialized government has such a value as in organizing public health. They admit Russia's backwardness in this respect, but they believe that with the help of the state's resources medicine can be developed rapidly to a degree that no individualist system will be able to equal.

Two such eminent public health authorities as John A. Kingsbury, of the Milbank Memorial Fund of New York, and Sir Arthur Newsholme, who was long the chief public health officer of Great Britain, told the writer after they had taken trips through Russia two years ago that the foundations for a public health service were being laid on a scale that no other country had yet contemplated.

Medical students in the Soviet Union by the end of the Second Five-Year Plan will number more than 100,000. Their five years' training expenses, including food and lodging, will be wholly paid for by the state. But there will be no more hurried granting of medical degrees, which produced "qualified physicians" after a two-and-a-half years' correspondence course.

Even that was better than it sounds. True, the said physicians had no higher real qualifications than the average American trained nurse, but the dearth of any kind of medical knowledge was so great here that even a half-qualified doctor was better than nothing. There are still villages in European Russia where the village priest and sorcerer vie in treating the sick.

Henceforth there will be an obligatory five-year training period, with entrance examinations to test the candidates' fitness and half-yearly examinations by a special state board, wholly independent of the hospital or school where the students are being trained, to insure that they are making progress.

The training program provides that 75 per cent. of the students shall become what one might call general practitioners, while the remainder, selected by examination, will be educated as specialists.

Medicine will probably predominate over surgery because the Russian Health Commissariat, which controls the medical profession, has been "sold" on the idea of preventive rather than curative treatment. In this connection the program provides a great extension of children's doctors, and it is interesting to note that 74 per cent. of the present-day medical students are women.

The new program further requires that doctors in villages or small towns must take a course not less than once every three years in an urban medical school or hospital to keep themselves up to date. For this their traveling and living expenses are paid, plus the full salary they have been receiving in their own post.

As this indicates, it is the intention of the authorities to eliminate private practise as far as possible. Their idea is that doctors should become salaried officials of the Health Commissariat, as is already generally the case in Moscow.

But even here, and to a considerable extent in other cities, private practise continues, and some physicians earn a great deal of money, but it is expected that this will be superseded before the end of the Second Five-Year Plan by a system in which every citizen through his "social insurance" will receive free medical treatment.

RUBBER PLANT EXPERIMENTS

EXPERIMENTS by the U. S. Department of Agriculture, covering practically every important plant used for commercial production of rubber throughout the world, have singled out as the most promising sources for domestic rubber: goldenrod; guayule, a shrub which grows well in the Southwest; and Hevea, the rubber tree of the tropics. Of these, goldenrod is regarded as the most likely to develop commercially. The recent transfer to the department of the Edison collection of goldenrod selections has given new impetus to the research program.

Rubber of good quality has been made from goldenrod, but the details of extraction and manufacture have not been developed sufficiently to produce rubber on a commercial scale. With present knowledge it would not be possible to make rubber from goldenrod at prevailing prices of about 15 cents a pound. However, the experiments now in progress lay the foundation for domestic rubber production in case of an emergency.

Guayule is a shrub native to Mexico and southern Texas which resembles sage brush and which can be harvested with machinery. Several thousand acres have been planted to guayule in California by a company interested in its development. For maximum yields, guayule is harvested only every fourth year, thus it would be necessary for farmers to have some assurance of a stabilized price before this crop could be grown on a large scale. Because the whole plant is harvested it is necessary to have a large area and a succession of plantings to insure a continuous harvest. It is a long-time, large-scale rotation.

Other sources of rubber which could be developed in this country if the price were high enough to warrant it include the Hevea, the rubber tree of the tropics. The department now has 30,000 of these trees growing in Florida, some of them from seed produced there. There is said to be reason to believe that the yield will equal that of the East Indies.

Rubber made from guayule and goldenrod in this country so far has not been so good as the imported product. In the opinion of L. G. Polhamus, who for several years has been engaged in a study of rubber plants for the Department of Agriculture, with continued improvement in methods of extraction, it is possible that domestic rubber from these plants might be made to approximate that from the East Indies.

So far, *Solidago leavenworthii,* one of the Edison selections, has the highest rubber content of any of the goldenrods analyzed. Specimens have produced more than 12 per cent. rubber. Another species, *S. fistulosa,* has analyzed as high as 9 per cent. rubber. A third species which yields from 4 to 6 per cent. rubber is considered promising because of its greater leaf production. The goldenrod experiments have not,

however, progressed far enough to warrant any one going into the business of growing or collecting goldenrod.

In experimenting with goldenrod many problems have arisen, which appear in almost every case when a plant is domesticated. Insect and fungous enemies may do little damage when the plant is wild, but once it is concentrated in cultivation these attacks become serious. Several root, stem and leaf diseases have been found in goldenrod plantings in Florida and South Carolina. Leaf diseases are especially disastrous because rubber is formed increasingly in the leaves as they mature, and it is necessary that they remain on the plant as long as possible.

Because of the uncertainty of reproducing desirable strains of goldenrod by seed, vegetative methods have been used. The underground stolons, which are produced freely, propagate readily. As many as five hundred new plants have been grown in a single year from the stolons of a single plant of *Solidago leavenworthii*, growing at Fort Myers, Florida. Plants grown from stolons produce a crop of rubber the first year.

There are two general processes for extracting rubber from plants. With the mechanical method, used with guayule in Mexico and California, the plants are ground up and macerated in a pebble mill. The rubber gathers into small lumps which can be separated from the powdered woody material by flotation in water. The other method is to dissolve the rubber out of the plants by chemical solvents. This is the method best adapted for use with goldenrod.

CONFERENCE ON THE BIOLOGY OF SEX

A CONFERENCE on the biology of sex was held from August 25 to 30 at the Marine Biological Laboratory at Woods Hole under the auspices of the Committee for Research in Problems of Sex of the National Research Council. The committee has been active since 1921. There is one annual meeting and from two to five other meetings a year as necessary.

Various aspects of the work of the committee and of cooperating investigators were discussed under the following subdivisions of the general topic:

"The Status of Work in the General Biology of Sex" by Frank R. Lillie and Carl G. Hartman.

"Endocrinological Problems of Sex" by Philip E. Smith and Charles R. Stockard.

"Neurological Problems of Sex" by Philip Bard and Karl S. Lashley.

"Psychobiological Studies of Sex" by Adolf Meyer and Calvin P. Stone.

Aspects of the physiology of sex and reproduction other than those previously considered were discussed by Edgar Allen and Frederick L. Hisaw.

Participating in the conference were the members of the committee: Francis G. Blake, Yale School of Medicine; Walter B. Cannon, Harvard Medical School; Frank R. Lillie, University of Chicago; Adolf Meyer, the Johns Hopkins Hospital; Clark Wissler, the American Museum of Natural History; Robert M. Yerkes, Yale University, and the following invited guests: Edgar Allen, Yale School of Medicine; Philip Bard, the Johns Hopkins Medical School; George W. Corner, University of Rochester; Earl T. Engle, Columbia University; Carl G. Hartman, Carnegie Institution of Washington; Frederick L. Hisaw, University of Wisconsin; Fred C. Koch, Karl S. Lashley, Carl R. Moore and William F. Ogburn, University of Chicago; Philip E. Smith, Columbia University; Charles R. Stockard, Cornell University Medical College; Calvin P. Stone, Stanford University; George B. Wislocki, Harvard Medical School; Emil Witschi, University of Iowa.

NEW YORK MEETING OF THE BIOLOGICAL PHOTOGRAPHIC ASSOCIATION

THE Biological Photographic Association, an organization embracing modern developments in photography, met on September 13, 14 and 15 for its fourth annual convention in New York University.

The convention was held in the biological laboratories of the Washington Square College, on the site where the first photograph of a human face by the light of the sun was made by Professor John W. Draper, nearly a hundred years ago. Louis Schmidt, of the illustration division of the Rockefeller Institute for Medical Research, was chairman of the convention committee.

Two exhibits were held in conjunction with the conference, one of color photography at the university and one at the Hotel Brevoort. The Brevoort exhibit included botanical and crystalline prints submitted by Dr. Silvestre Prat, a member of the association, and his associates of Prague, Czechoslovakia.

The convention opened on Thursday with the address of the president, Ralph P. Creer, of the Edward Hines, Jr. Center, Hines, Illinois. The annual banquet was held at the Hotel Brevoort. Speakers included Mr. Schmidt, Mr. Foster and W. H. Zieler, of E. Leitz, Inc., New York City, on "Photomicrography of Living Objects"; Leonard A. Julin, of the Mayo Clinic, Rochester, Minnesota, on "Some Notes on Photography at the Mayo Clinic," and F. R. Harding, of the Children's Hospital, Boston, on "The Importance of the Human Relations of the Biological Photographer with his Chief, his Client and his Patient." On Friday there was a discussion of infra-red photography in medicine by Leo C. Massopust, of Marquette University. L. V. Foster, of the Bausch and Lomb Optical Company, Rochester, New York, spoke on "Photomicrography with Ultraviolet Light," and