

tion, "to be held in custody for the nation," has restored the memorial rooms as nearly as possible to the state in which they were when Darwin lived there. Much of the furniture is original, and, thanks to the generous assistance of members of the Darwin family and admirers of Darwin, the pictures and other objects and the articles which Darwin had in daily use are here in what was formerly their accustomed place. Among the latest acquisitions are selections from the letters (in facsimile) from Darwin to Fritz Müller, the German naturalist, who was Darwin's correspondent in Brazil between 1865 and 1882. These letters

were acquired in 1929 by Professor Henry Fairfield Osborn, of the American Museum of Natural History, New York. Professor A. C. Seward, professor of botany in the University of Cambridge, has recently expressed his intention of placing on loan at Down House the major part of the Darwin Library, which was bequeathed by Sir Francis Darwin to the professor of botany in the university for the time being. The catalogue, which has been prepared by Mr. Buxton Browne and the secretary of the British Association, gives brief historical and descriptive notes on the house and grounds, and is illustrated.

## DISCUSSION

### THE POSITION OF SCIENCE IN SOVIET RUSSIA

I SHOULD like to add my impressions to Professor Cockerell's contribution in a recent number of SCIENCE. During my travels in the Soviet Union for three months last year, it was evident to me that science and the scientific method have assumed an importance in the minds of the Russian leaders second only to communism. In every town that I visited there were new scientific institutes. Small laboratories have been attached to almost every kind of establishment, from the experimental vineyards of the Transcaucasus to the kitchen factories of Moscow.

At the Academy of Sciences in Leningrad I made special inquiry whether research work is encouraged by the Soviet Government. Professor Paul Nikoff, the director of the Seismological Institute, who was a member of the staff before the revolution, was emphatic in affirming that research receives the greatest encouragement, and as evidence showed me a number of reprints of recent scientific investigations made by his department. He said that before the revolution the department had a staff of three men, including himself and Prince Galitzin. Last summer the department had a staff of seventy persons, located in twenty-five different stations in the Union. The government is building a 500,000-ruble seismological laboratory on the site of a building belonging to a pre-revolutionary beer baron. "The former wine cellars," he said, "will provide us with excellent constant temperature rooms." At the time of my visit several mechanics were busy in the machine shop with the construction of seismological instruments of a type recently developed by the department.

How is one to reconcile this situation with the reports of the plight of scientific men in the Soviet Union, particularly that of members of the Academy of Sciences? How can it be reconciled with the

recent declaration of policy limiting research to the field of applied science?

This is one of the many contradictions which exist in Soviet Russia. For example, why are the Bolshevik leaders so ruthless in dealing with individuals, while at the same time they express sympathy with the lot of the under-dog? Why are they creating new classes, such as the disfranchised groups, while at the same time they profess to aim at a classless society?

In order to explain these and many other contradictions between Russian theory and practice, we must try to look into the minds of the Bolsheviks and to understand their point of view. If we do this we shall find that their principal anxiety is to safeguard the future of the revolution. In their determination not to repeat the mistakes of the French Revolution they are willing to sacrifice anything and everything that they suspect of contributing in the slightest measure to the possibility of counter-revolution. Their ruthlessness toward kulaks, toward private traders and toward engineers and scientists whom they suspect of having capitalistic leanings is due to this anxiety.

Furthermore, the Bolshevik leaders consider their country to be in a state of war, a war against the old order. They take their war even more seriously than we took the World War. If we refresh our memories with regard to some of the things that were done during the World War under the impulse of war psychology, in sending scientists into the trenches, in dealing with people suspected of sympathizing with the enemy, in committing to prison for ten to twenty years people who declared themselves to be opposed to war, we shall gain some inkling of the present psychology of Russian communists.

Another factor that affects the position of science in Russia is the question of *valuta*, that is, foreign

currency to pay for imports. While there I heard complaints from engineers and scientists that they find it difficult to get scientific books and apparatus from abroad. If the government is eager to develop science and to educate engineers, why do they make it difficult to import scientific material? For the same reason that they are placing the people on starvation diet by exporting everything they can put their hands on, while bending all their energies toward the ultimate improvement of the economic condition of the people—namely, in order to make the revolution safe. They are afraid of foreign aggression and are hectically working to industrialize the country before the countries of western Europe are in a position to attack them. In order to secure themselves, through industrialization, against aggression, they sacrifice the present welfare of the people and the progress of science by exporting everything for any price obtainable and importing only the machinery and raw materials which are necessary for their industrial and agricultural program.

The Russian leaders consider the completion of this program to be an absolute necessity. Everything else, however desirable, they place in the category of luxury which they must do without for the present. That is why they are anxious to divert man power and material from pure science, which would be of value to them in the future, to applied science which they need badly now.

It seems to me that in view of the great value of pure science and the slowness with which it can be developed, the policy of expediency adopted by the Bolsheviks is a mistake. But I feel confident that as soon as the present critical situation in Russia becomes easier, science, pure as well as applied, will find in the Soviet government one of its most generous supporters.

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### HORMONES IN CANCER

THE conception that the extension of neoplasms is due to the lack or imbalance in growth-regulating hormones is old. In the past two years we have been engaged in testing the effects of practically all the established hormones and many glandular products, such as the Sokoloff, Watermann and de Kromme, and Coffey-Humber extracts, upon transplantable rat sarcomas and carcinomas. None of these extracts appreciably affected the rate of tumor growth or final mortality as judged by statistical analyses. A possible exception to these findings was a crude extract of the anterior lobe of the hypophysis, which contained a standardized amount of growth hormone, a slight increase in the rate of tumor growth of dosed rats being noted.

We have resorted to irradiating the head of the animal with roentgen rays and implanting radon seeds into the pituitary region in an attempt to stop the activity or destroy this body. Since such a treatment might affect the parathyroids and thyroids by back-scattering, experiments with parathyroid-thyroidectomized animals were also made.

In attempting to destroy the hypophyses the maximum dose of roentgen rays was applied to the rat's head, the body being protected by lead to minimize back-scattering effects. Six series of experiments using twenty to thirty rats per series were performed. With sub-lethal doses of the rays and in a radon series the rate of tumor growth was significantly retarded during the period when the body weight curve remained stationary. Doses insufficient to stop or retard body growth had little effect upon the rate of tumor growth. It has been said that any state which decreases the nutrition of the body as a whole or the tissue in which a tumor is located decreases the rate of growth of the tumor. This objection has been controlled in our experiments by starvation and poisoning by synthalin and heavy metals, both of which retarded body growth without affecting the rate of tumor growth. The experiments with the roentgen ray indicate that the growth factor associated with the pituitary contributes to the regulation of both the rate of body growth and the rate of tumor growth. The experiments with parathyroid-thyroidectomized animals showed that these glands have no demonstrable effect upon tumor growth.

In the experiments with the roentgen ray, radon and the pituitary growth hormone, no effect upon the incidence of tumor takes was noted.

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### HEMOPHILIA<sup>1</sup>

HEMOPHILIA or bleeders disease is a rare disease of the blood, which has a strong hereditary tendency. Only males have the disease, while it is transmitted through the unaffected female. The outstanding symptom of hemophilia is a tendency to excessive hemorrhage. The bleeding may be spontaneous from any part of the body or it may follow a slight injury which would pass unnoticed by a normal individual. It is well known that a strong hemophilic tendency exists in several of the royal families of Europe. The ill-fated Czarovitch of Russia was a high-grade hemophilic. The present Crown Prince of Spain also suffers from this disease. In this disease the clotting time of the blood is greatly prolonged.

<sup>1</sup> Presented before the Chicago Society of Internal Medicine, February 23, 1931.