

SCIENTIFIC FARMING TO CONQUER DROUGHT ALONG THE VOLGA

Some 77,000,000 roubles (about \$35,000,000) have been appropriated by the Soviet government to fend off famines in the Volga district. On experimental farms attempts are being made to find the best system of crop raising to offset the disadvantages of the irregular rainfall in the famous famine region of southeast Russia known as the Lower and Middle Volga.

The average precipitation in this huge section is only 16 inches per year, conditions which are about the same as those in the state of Utah, according to a report by N.M. Toulaikoff, director of the agricultural experiment station at Saratoff, made to a committee of the Geographical Society of Geneva studying world calamities. The same conditions prevail in the south of the Ukraine and a considerable part of northern Caucasus.

If advantage were taken of all the natural factors which go to make up the local climate and if modern methods of agriculture were used, there would be enough moisture to insure a regular succession of crops, M. Toulaikoff maintains. Taken as a whole this part of Russia has never been extensively cultivated and in consequence is very fertile. Rye and summer wheat cultivated under modern conditions have been made to produce heavier yields than were ever before obtained in this section. Introduction of Indian corn, millet, beets and other vegetables which do well in hot weather might very profitably lead to cattle breeding and an increased milk supply it is believed.

Since drought in April, May and June always spelled disaster to 90 per cent. of the usual crops sown, in the old days the peasants always kept on hand reserve supplies to carry them over the bad years. Agricultural conditions, however, like everything else, have been completely unbalanced with consequent distress to the rural population.

The only solution, declares M. Toulaikoff, lies in building up a carefully organized system of farming that takes full advantage of natural local conditions, since irrigation on such a large scale and under present conditions is out of the question.

SMALLEST PARTICLES SAID TO SURROUND ELECTRONS

That particles even smaller than the electrons, hitherto supposed to be the smallest things in the world, surround the parts of which atoms are built up, and that this hypothesis may reconcile the old wave theory of light and the newer "quantum" theory, is the suggestion made by Sir Joseph Thomson, considered the leader of British physicists. This was made in his recent Kelvin lecture before the Institution of Electrical Engineers. According to modern notions, an atom consists of a central, rather massive, nucleus charged with positive electricity called a proton, surrounded at relatively great distances by ultra-minute particles of negative electricity called electrons, which rotate in different orbits around the nucleus.

In order to reconcile the modern view that energy is omitted in small separate bundles or "quanta", with the older ideas, Sir Joseph said, it is necessary to assume

that both the proton and its satellite electrons are surrounded by an atmosphere of much smaller particles, the impact of which on the protons and electrons causes them to vibrate and send out energy. "Both proton and electron must be regarded as nebular systems," he stated.

Theory indicates that the vibrations or oscillatory movements of protons and electrons should give rise to electrical waves, and Sir Joseph believes that such waves are actually produced, although ordinarily they are unable to escape from the outer confines of the atom, being reflected back into the interior. The so-called "quanta" of light he believes to consist of bundles of electrical waves shot out from the atom at the same time as ordinary electro-magnetic waves.

SCIENTISTS UNDERGO SLOW POISONING FROM MERCURY VAPOR.

X-rays are not the only toys of science to extract a toll of physical suffering at the hands of their intrepid users.

The insidious poisonous effects upon himself of mercury vapor, utilized in a period of research experiments extending over twenty years, have just been described in a scientific paper by the famous chemist, Prof. Alfred Stock of the Kaiser Wilhelm Institute. Chronic troubles of the nose, throat and intestines were rendered more aggravating by increasing nervousness and as time went on his naturally excellent memory and powers of concentration grew weaker and weaker. No course of treatment prescribed by his physicians proved permanently helpful.

Eventually it became evident that collaborators in his own laboratory as well as colleagues in other places were being affected in the same way. In consequence it was decided to readjust laboratory conditions so that as little free mercury would be exposed to the air as possible. And at the same time a thoroughly efficient ventilating system was installed.

In the course of a few months the various ailments fell off gradually and after a period of years health in some cases was restored completely when the experimenter refrained from further contacts with the fatal element.

Medical science, Prof. Stock declares, is not aware of the danger arising from the inhalation of mercury fumes, the chronic poisoning from which, in his opinion, is quite as fatal as the better known poisoning from lead.

Great waste in the paper industry is due to the decay of pulp and pulp wood.

Gas caused over one-fourth of American battle casualties in the European War.
