NUCLEAR PHYSICS

Russian Atom Scientist

If the Soviets have an atomic bomb, it now seems certain it was not built by the world-famous Dr. Kapitza. He has been relegated to the Communist dog-house.

➤ IF Russia has the atomic bomb or is close to achieving it, it is not because of the work of the world-famous Dr. Peter Leonidovich Kapitza, British-trained physicist who once worked in the Cavendish laboratories of the late Lord Rutherford at Cambridge (*See SNL,* July 23, p. 54).

For Kapitza has been in virtual retirement, not of his own choosing, living for the past two years or so in a country house not far from Moscow. He was neither banished to Siberia, as some rumors had it, nor did he disappear to play an important part in Soviet atomic energy research.

He has been in the Communist dog-house, but it was because his plans for tripling the production of steel in the USSR through use of liquid oxygen did not work out as promised, although they were partially successful.

Information is that Kapitza is actually back in Moscow working rather obscurely in a laboratory much less important than the one that he headed for years before and during the war.

Until the spring of 1935, Kapitza had been working in England at Cambridge on low-temperature problems. The Mond laboratory had been dedicated there in 1932 with powerful magnets that for a fraction of a second could produce a magnetic field more than a million times as great as the earth's magnetic field. Kapitza was using such apparatus in an attack on the secrets of the atom and physical laws.

He went back to Russia for what he thought to be just a visit. His passport was cancelled, and it was announced that he was "detained." The Soviet authorities wanted Kapitza's researches to be done at home.

So the British decided that it was better for the world to have Kapitza using the special equipment provided for him at Cambridge than to have Kapitza and the apparatus both idle and unused. So they sold the electromagnets and other equipment to the Russian government and they were moved to Moscow.

Interestingly, the money obtained was used to purchase for England its first cyclotron, which proved so important in atomic search.

Kapitza in his Moscow Institute for Physical Problems was fruitful. He did pioneering research on the very low temperatures near absolute zero where metals show little or no electrical resistance. He discovered that liquid helium, for instance, exhibits zero viscosity.

An outgrowth of this work was the invention by Kapitza of a turbine for production of oxygen at a low cost. It was reported to be a sixth of the size of conventional installations and it operated at four atmospheres instead of 200 atmospheres. It also began to produce oxygen very quickly and, combined with a nitrogen removal system, was suitable for the industrial production of oxygen. When a party of American scientists went to Russia just after the fall of Germany in 1945, Dr. Irving Langmuir, the General Electric chemist and Nobelist, learned from Kapitza that Soviet oxygen liquefaction units were supposed to produce oxygen at one-thirtieth the cost of the best units used by the Germans during the war in rocket fuel production.

The cheap oxygen was to be used in new methods of steel production in the Donbas and Soviet Asia and $2,000,000,000 were supposed to be spent on this gigantic project, financially of the order of the USA atomic bomb Manhattan project, which of course at that time the Soviet did not know.

Despite the fact that in 1945 200 tons of steel daily was reported being made in a pilot plant at Kapitza's institute, at a cost of about 25% to 30% that of ordinary blast furnaces, evidently the process did not work out as expected or something else happened. In any event, Kapitza lost face and his job. Toward the end of 1946 it was rumored that he had been sent to Siberia, presumably because he wasn't working on atomic energy.

Even if the rosy prospects of cheaper Soviet steel, thanks to Kapitza's oxygen, have not been completely fulfilled, oxygen is beginning to aid steel production in the United States, England and elsewhere.

Most immediate use of oxygen contemplated in the steel industry is in the open hearth process, the enriched air being blown in at the junction of the metal and the slag to speed the removal of the unwanted elements from the steel being manufactured.

Several steel companies have pilot plants based on this process in actual operation, but none of them are going all out for the use of large amounts of oxygen in steel production, so far as can be learned. Oxygen can also be applied to the electric furnace, to steel-making converters and to a lesser extent the blast furnaces that produce pig iron primarily.

Science News Letter, September 3, 1949

ENGINEERING

Playgrounds with Rubber Surfaces Are Under Trial

➤ PLAYGROUND children may soon be bouncing around on a rubber surface, saving shoe leather, clothing and the danger of skinned arms, legs and faces. A test in-

RUBBER-SURFACED PLAYGROUND—Ground-up rubber was mixed in asphalt for this test-installation of a new surface. It will mean a saving in shoe leather and clothing and will prevent skinned arms, legs and faces in accidental falls.