are achieved. In addition, the iron output rises by two per cent in comparison with the arc furnace. For every ton of quality steel about 60 Kilowatt-hours less electrical energy is needed. Steels and alloys with extremely low carbon content can be produced, e.g., high-alloy welding material and quality steels for special areas of application. Production costs go way down. Specific smelting capacities rise by up to 30 per cent. Compared with an arc furnace of the same size, the 30-ton plasma furnace distinguishes itself through considerably better working conditions, and it is more friendly to the environment, e.g. the enormous noise pollution disappears.

ND: These facts certainly do make it clear that we're dealing with a top achievement comparable to the development, design and production of the multiple spectrographic camera made by VEB Carl Zeiss in Jena. And here, as there, the most significant reason for this successful push toward scientific and technological excellence is close cooperation with the Soviet Union.

Dr. Müller: Yes, here we have the proof that the joining up of our forces leads to large profits in time and efficiency, to accomplishments which have been attained nowhere else in the world until now. The basis for this was a 1971 agreement signed in the context of the Parity Governmental Commission of the GDR and USSR. In the course of our joint development work we were able to draw upon experience gathered from a 3-ton furnace in our republic, a 5-ton furnce in Chelyabinsk, and then later also from the 10-ton furnace in Freital. The furnace was built and equipped according to joint specifications in a period which represents an international record.

ND: Since we're talking about international comparisons: our two countries are therefore the only ones possessing an operating plasma smelting furnace. Where do other countries stand?

Dr. Müller: Both in Japan and in France an induction furnace with plasma additive heating and a smelting mass of one ton has been developed. In the USA, all development in this area was halted six years ago, largely because of the complete failure of a large technical experiment at the US Steel Corp. The GDR and the USSR are, therefore, now actually the only countries in the world which have a plasma smelting furnace of this size, and what's more, are producing on a three-shift schedule. Naturally, in the non-socialist economic sector there is great interest in our joint results, that is, in licenses.

ND: So can we therefore say that with this new technology and the unit belonging to it we have found a real alternative to the previous primary smelting processes?

Dr. Müller: Yes. Until now, as I already said, the arc furnace was the last word in technology for the production of quality and stainless steels. And that oven can look back on a 75-year history of development. The four-year operation of the 10-ton plasma furnace in Freital and the figures given for the 30-ton furnace prove that the capacities of an arc furnace of the same size are not only matched, but are clearly surpassed. Also, looking at it from the energy side, the question about an alternative can be answered affirmatively. Electricity will be our major source of energy beyond the year 2000, and plasma smelting is already now a process which uses electricity most efficiently, transforms it into the highest temperatures and can be applied for the production of steels of the highest quality.

How The GDR Develops Scientists

Behind the ground-breaking progress in the application of plasma technology for steel production, demonstrated in the GDR's plasma furnace at Freital, lies the conscious policy of the Council of Mutual Economic Assistance countries to promote technological advances and the scientific creativity on which they depend. The official wide-circulation press of the GDR, for example, has been the forum for a public discussion by that country's scientists on the necessary conceptual approach to scientific progress.

In the daily *Neues Deutschland* Jan. 15, Professor Guenter Kroeber contributed a commentary on the personal qualities necessary for scientists: persistence and personal involvement in the task of applying fundamental scientific progress to change technologies. But the scientists "human creative capacity" plays the leading role, stressed Kroeber, "since new knowledge only occurs through creative intellectual achievements." The potential for perfecting the creative capacities of scientists is "practically without limit," he said. "What is required is efforts to constantly expand one's own scientific horizon and to perfect the methodology of scientific work. The potential of scientific creativity grows, if the individual or group makes