state & society

Digging continues at CERN II: 400 GeV expected by 1976

The CERN 300-GeV Program is on schedule with respect to both calendar and finances and is expected to produce 400-GeV protons in 1976. For a while there were thoughts of having the 300-GeV synchrotron produce 500-GeV protons by filling half its ring with superconducting magnets (PHYSICS TODAY, December 1972, page 17), but this proposal has been abandoned. Some consideration has already been given to the form a 1000-GeV machine would take.

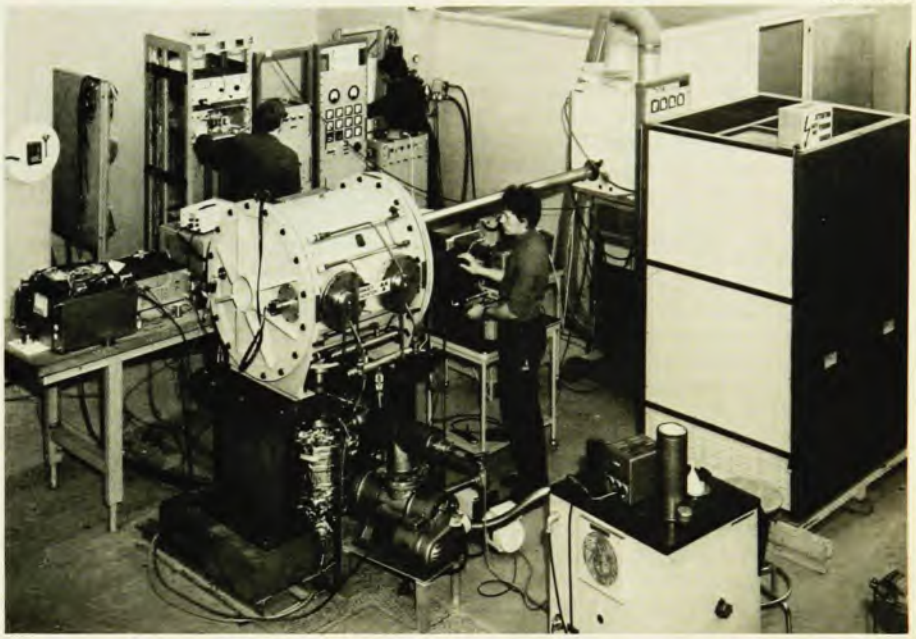
When we recently visited CERN Laboratory II, the organizational entity established to build the Super Proton Synchrotron, we visited the construction sites and chatted with the director, John Adams. He volunteered to let us visit the tunnel, provided we were willing to walk up. A staircase is provided, he noted, but the tunnel is as deep as the height of the highest building in Geneva—60 meters. The alternative is to ride the bucket on a crane, but Adams discourages such peregrinations. So we elected to view the tunnel from outside.

The site is not very striking from the air because there is no bank of earth around its huge circumference. Instead the tunnel is sunk below the moraine into the rock for reasons of stability, and to reach the rock it is necessary to go 60 meters below the surface at the deepest point and 25 meters at the shallowest. The ring itself is 2.2 km in diameter. By now the tunnel boring has gone halfway round the ring. Adams notes that some people call the SPS, "Subterranean Proton Synchrotron."

Last year most of the manufacturing orders were placed, and some items have been received. We saw magnets, for example, already being tested in a huge hall on the site. Four hundred magnets were ordered, initially, and now an additional 400 have been ordered. The beam lines use about 200 more.

Superconductors. When the decision to build the SPS was made in February 1971, the exact form of the synchrotron was left flexible, to leave all technical options available. A missing-magnet scheme was adopted, in which only half the bending magnets would be installed; these would be conventional iron-core magnets. Then in mid-1973 the decision would be made whether to make the other half iron-core magnets or superconducting magnets. With the first option, the machine could reach 400 GeV and with the second, 500 GeV.

CERN PHOTO



Testing a prototype radiofrequency cavity at the CERN Super Proton Synchrotron. The 400-GeV accelerator will have three rf cavities, each 20 meters in length.

To prepare for the decision, a committee called GESSS was established, with representatives from the Rutherford High Energy Laboratory in England, the Karlsruhe Laboratory in Germany and the Saclay Laboratory in France. The three laboratories coordinated their efforts in designing superconducting magnets suitable for the SPS. By the beginning of 1973 each had produced one or more superconducting magnets and tested them. The magnets were pulsed for hours and weeks at a time at the cycling rate

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Peace Corps calls for volunteers

In a time when physics jobs are hard to come by, the Peace Corps may serve as an outlet for some physics talent. Developing countries around the world are beginning to make requests for large numbers of science and mathematics personnel—more requests than the Peace Corps can handle. A number of problems exist, however, including the placement of Peace Corps physics volunteers in jobs after their two years of service and the need to inform some countries that really need highly trained science personnel that they may be available through the Peace Corps.

For the 1973–74 school year, 131 requests arrived for physicists with bachelor's, master's or PhD degrees. Zaire has requested the most—needing 20 people for physics and 45 to combine physics and mathematics. Requests have come from other places including Malaysia, the Philippines, Ghana, Afghanistan and Kenya. Very few requests, so far, have come from Latin America.

The primary work of most volunteers is teacher training. Volunteers will work with local teachers to develop education programs that will continue after they leave. John G. Watson, who is now doing graduate work at the University of Toledo, was directly involved

One man's experience

We spoke with David Berkowitz (Mitre Corporation, Bedford, Mass.) about his experiences as a Peace Corps volunteer. He lectured at the University of the South Pacific (Fiji) from 1970 to 1972 and conducted laboratory sessions such as the introductory electronics lab shown in the photograph. He reports that he had an excellent experience during his stay: "If you elect to work as a Peace Corps volunteer, it's immediately much more of an experience than just going somewhere and lecturing. It implies getting much more into the culture, learning the language and having a living experience." Berkowitz, however, cautioned prospective volunteers that there can be a great financial sacrifice involved, especially for a more established scientist. He was with his wife and two children and had to live frugally, which did have an advantage—their living style was more comparable to local people and helped to reduce social distance.

Berkowitz talked also about his students: "They were extremely well motivated. They were eager to learn and their eagerness helped them to overcome great obstacles insofar as preparation was concerned. Mostly they were very weak in mathematics."

An important project that Berkowitz worked on involved increasing educational communications in the Pacific. PEACESAT (Pacific Educational and Communications Experiments with Satellite) uses a NASA synchronous satellite to allow students on islands many hundreds of miles from Fiji to talk with faculty at the university. "It is illustrative of the fact that in many of the developing regions, communications out to the region are very poor, and frequently nonexistent," he said. "The influence of the university is felt only in the local metropolitan area, unless something is done to increase communications."

—RAS

in teacher training during a Peace Corps stint in northern Peru (1969–71). Watson reports in the October 1973 issue of *The Physics Teacher* that the Peruvian physics teachers initially did not know their subject matter adequately—Spanish editions of the PSSC text were to become a cornerstone of the subsequent enlightenment. Team problem solving, daily quizzes and practical methods of constructing laboratory equipment from available materials all helped to make the Peruvian teachers more effective. Watson comments that these techniques served well with much carry over into the classrooms throughout Peru.

Depending on the physicist's training, different levels of teaching are possible. Elementary schools, high schools and universities have openings. Depending on the requirements of an area, a bachelor's degree or master's degree is needed for the high-school level and a master's or PhD is needed for the university. In some areas where university teachers are scarce, the Peace Corps volunteer may teach classes in addition to his training teachers.

Physicists who become Peace Corps volunteers have, for the most part, been recent degree recipients. A program to encourage even more young physicists to go overseas is being developed by the Committee on International Education in Physics of the AAPT. A Peace Corps Science Associates program where a postdoctoral fellow spends the initial or middle two years of a four year university fellowship in the Peace Corps is one of the possibilities that the committee is considering. A university commitment of this sort would help to alleviate a major problem that some Peace Corps physicists might have—finding a job after being away for two years.

Committee Chairman Michael Moravcsik (University of Oregon) commented to us about another issue of concern. Most countries must initiate requests for Peace Corps volunteers. In many cases, local governments have never had PhD physicists as Peace Corpsmen and do not think to request them. One solution proposed is that US scientists use contacts they have in various developing nations to stimulate requests, particularly for physics activities other than teaching (including research and applied science projects).

Peace Corps volunteers sign up for a two-year stay. Husband and wife teams are acceptable; only a limited number of positions are open to couples with children, however. Orientation and language training is done as much as possible on site. All expenses are paid and $75 a month is put away for the volunteer until he returns. Interested? Write to Action, Washington, D.C. 20525 or call toll free (800) 424-8580.

—RAS

Four USSR hunger strikers interrogated by police

Early in December four of the seven Soviet scientists who went on a two-week hunger strike last June (PHYSICS TODAY, September 1973, page 78) were interrogated by the police. They were told they are being investigated on charges of parasitism. The four men, physicists Mark Ya. Azbel and Alexander Voronel, cyberneticist Viktor Brailovsky and mathematician Alexander Luntz, had lost their jobs when they applied for exit visas to Israel. In a related matter, a Sverdlovsk engineer, Leonid Zabelishensky, who had been teaching computer theory, lost his job and was sentenced on 17 December to six months for parasitism.

Azbel and Voronel, who have been appointed professors at Tel Aviv University, have also received job offers from the University of Washington. Azbel is an eminent solid-state theorist. Voronel has been collaborating for a long time with Moshe Gitterman in research on critical phenomena.

Gitterman, who was also one of the hunger strikers, was allowed in September to emigrate to Israel, along with his wife, two children, aunt and mother. He is now a professor at Bar-Illan University near Tel Aviv. When Gitterman visited the US in November we discussed the question of why Voronel has not been permitted to leave. For the last 12 years Gitterman and Voronel have studied the same scientific problems, working in the same room at an "open" institute, and publishing their results in the open literature. Gitterman is completely puzzled that he was given permission to leave whereas his closest friend and collaborator has been waiting to go to Israel since March 1972.

Weinberg appointed to US energy R&D position

Physicist Alvin M. Weinberg has been appointed director of the energy research and development office in the Federal Energy Office. Weinberg was director of Oak Ridge National Laboratory from 1955 through 1973 and is succeeded there by Herman Postma (see page 83). Since 1 January Weinberg has been director of the new Institute for

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