

BEIJING Chinaware

Good progress is being made for the BEPC Beijing Electron Positron Collider, designed to provide beams of between 2.2 and 2.8 GeV in a storage ring supplied by a linac taking the electrons and positrons to 1.4 GeV.

Civil engineering work for the linac was completed in the middle of last year, eighteen months after a memorable ground-breaking ceremony attended by many high-ranking party and government officials. The rapid pace of the construction work demonstrated how much importance the national authorities attach to basic research, with the local government according the project high priority in the face of a heavy demand for dwelling construction.

The linac building is 217 metres long and with the accelerator tunnel and klystron gallery occupies 2400 square metres. Installation in the klystron gallery began in January 1986, and in the tunnel the following May while water supply and air conditioning systems were still incomplete. The initial few months were difficult, with an abnormally wet summer, while the high humidity inside the non-air-conditioned tunnel stopped installation work for about 50 days. However subsequent progress has been quite good.

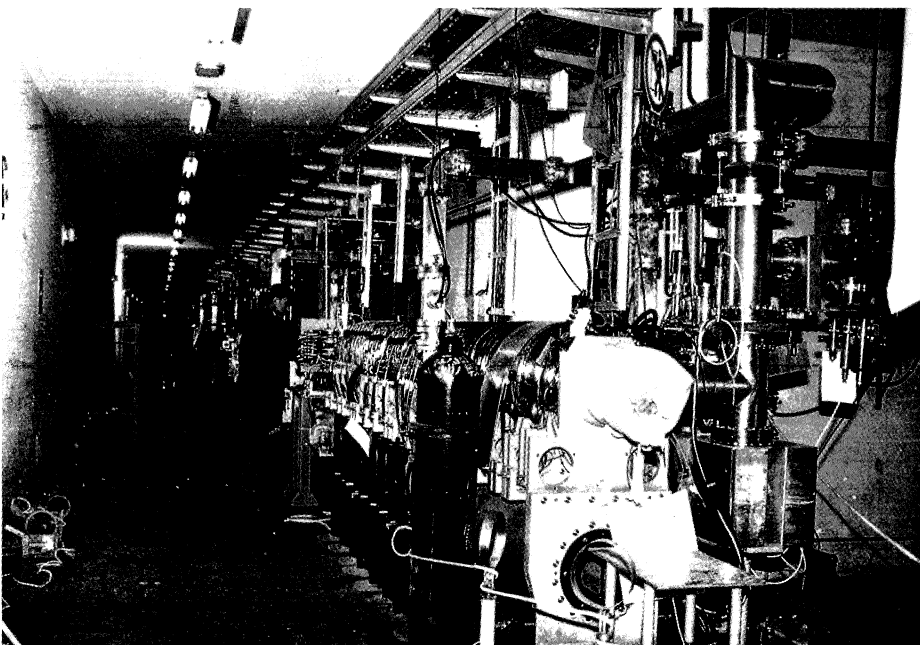
All linac components have been received and transported to the site. Accelerating sections are being installed in parallel at both ends of the linac. Equipment at the north



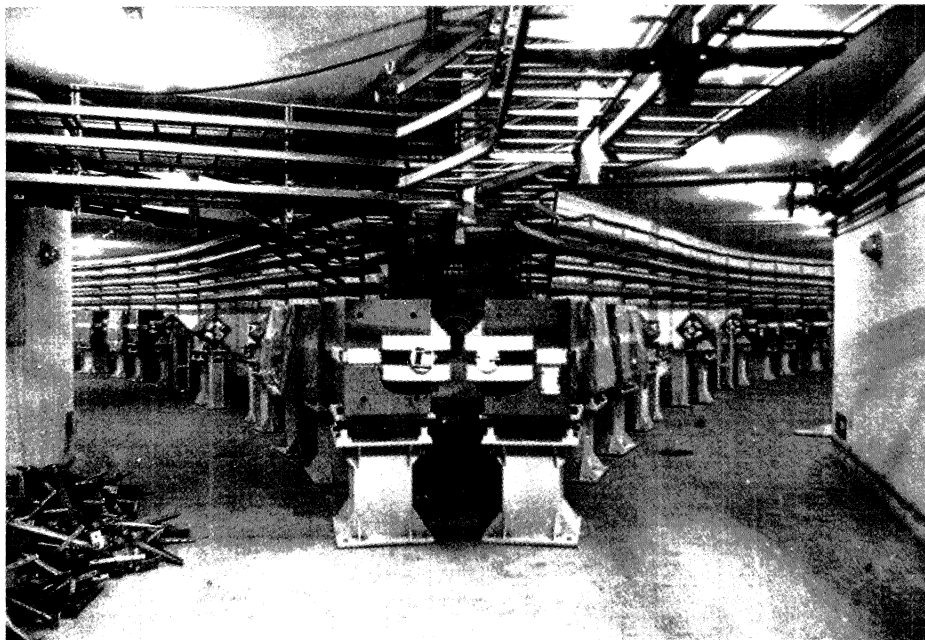
(electron gun) end includes eight accelerating sections powered by four klystrons, and has provided 250 MeV electrons. All subsystems — radiofrequency, vacuum, water cooling, beam control and measurement, local control, etc. — are working well.

The largest coil in China — 32 ton solenoid for the Beijing spectrometer — en route from the winding factory to the Laboratory.

First detector to use the BEPC beams will be the BES Beijing Spectrometer based on a conventional solenoid coil producing a field of 0.4 tesla. The coil — the largest in China — was designed by a group from the first physics division of the Institute of High



Installation for the 1.4 GeV electron/positron linac for the Beijing Collider is progressing well.



The parting of the ways — the Beijing electron and positron injection tunnels.

Energy Physics (IHEP), responsible for the detector, but manufactured by the Institute of Atomic Energy (IAE).

The solenoid has an outer diameter of 4.2 metres and weighs about 32 tons. About 4000 metres of hollow aluminium conductor of cross-section 20 square centimetres (purchased from the US) were wound at IAE.

Transportation of the finished coil was a major local event. Even though IAE and IHEP are only 50 kilometres apart, the epic journey took two days and 150 stops, and involved several hundred people.

Once safely in the experimental hall, the coil was covered with its iron yoke consisting of 300 tons of Japanese steel processed by Xinhe shipyard in Tianjin, northern China.

CORNELL Record

Cornell's CESR electron-positron storage ring reached new heights recently with a peak luminosity of $5 \times 10^{31} \text{ cm}^{-2} \text{ s}^{-1}$ during runs at the fourth (4S) upsilon resonance at 10.58 GeV, a world record for electron-positron collisions*. It was



**CERN's ISR machine, turned off in 1984, achieved a maximum proton-proton luminosity of $1.3 \times 10^{32} \text{ cm}^{-2} \text{ s}^{-1}$.*

achieved with seven bunches in each beam, and an average of some 50 mA per beam.

Both the CUSB II and CLEO experiments operate in 'micro-beta' mode, squeezing the beams tightly together at the collision points. Both experiments have been taking data at 1.5 pb^{-1} per day. Future efforts to boost the luminosity still higher will concentrate on shortening the bunch length (presently 2.2 cm). The present beam current is limited by problems due to higher-order mode fields induced by the beam bunches in electrostatic separators and radiofrequency cavities.

(The DORIS electron-positron storage ring at the DESY Laboratory in Hamburg achieved 1.563 pb^{-1} over one day in 1984, while the PEP electron-positron ring at Stanford had a 1.6 pb^{-1} day in 1983.)

Operating crew of Cornell's CESR electron-positron ring celebrate a world record (peak luminosity $5 \times 10^{31} \text{ cm}^{-2} \text{ s}^{-1}$): left to right R. Eshelman, M. Billing, Barbara Gardner, D. Kemmick (seated at console), D. Rice, D. Morse, R. Littauer and D. Sagan.