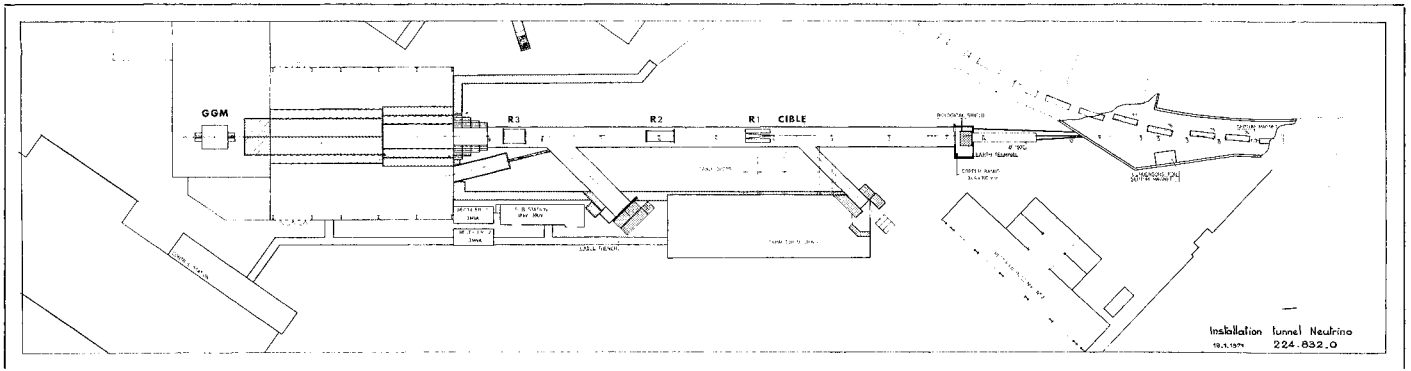


Plan of the new neutrino beam-line. On the left is positioned the heavy liquid bubble chamber, Gargamelle, behind a steel shield 22 m thick. The proton beam is ejected from the synchrotron on the right and directed onto a target positioned inside a magnetic horn. Two further focusing units (R) guide the neutrino parents towards the chamber.

5/2a



aluminium (boron carbide), horn current 340 kA (300 kA).

The new neutrino beam-line uses most of the components of the previous one (see vol. 6, page 215). The main differences are :

- the shape of the focusing horn has been slightly improved
- the horn can now be changed for a spare (since this is a comparatively fragile unit because of the high current density).

The replacement of the horn involves disconnecting the water and power connections, moving a 100 tonne surrounding shield, removing the target, moving the horn with the aid of the overhead crane (using TV cameras to supervise and control the operation), and then installing the replacement horn in the reverse sequence. All this takes only half an hour as against at least a day which was previously needed because of the need to allow the area to 'cool down' before starting work.

The power cables supplying the horn, the insulation of which was damaged by radiation, have been replaced over a length of 13 m by long sandwich plates with a cross-sectional area of $400 \times 15 \text{ mm}^2$ (separated by a few millimetres of insulating material).

A new steel shield built of parallelepiped blocks (3000 tons, 22 m long) has replaced that of the old line. Transverse channels have been built through the shield where different

types of detectors providing information of the muon spectrum (and thus of the neutrino spectrum) are installed. The detectors, which are connected to an on-line computer will monitor the beam so that any necessary corrections may be made. A mercury-filled tube passes through the shield along the beam trajectory and can be partially emptied periodically to allow muons through in order to calibrate the chamber. There is also an oblique passage from which the shielding can be removed to allow the chamber to be supplied with high-energy proton, pion and muon beams when required.

The number of neutrino events anticipated in Gargamelle will be 1 per 20 photographs, as against 1 per 1000 during the last neutrino experiment in 1967 (using the CERN 1.2 m heavy liquid chamber). This is due to the increased volume of the chamber, the lengthened distance between target and chamber, and the fact that the experiment will be carried out at an initial proton energy of 24 GeV instead of 20 GeV.

Progress on the commissioning of Gargamelle itself is proceeding satisfactorily, and the first tests with neutrinos are due to begin at the end of January. Two six-hour testing periods, each taking all twenty bunches from the PS are scheduled for January and February. The neutrino experiment is scheduled to begin early in May.

Council elections

At the 45th Session of the CERN Council held on 22 December, elections were held for the senior positions of the Council and its Committees. Professor E. Amaldi (Italy) was re-elected President of the Council for the coming year and the Vice-Presidents, Mr. A. Chavanne (Switzerland) and Mr. H. Haunschild (Federal Republic of Germany) were also re-elected.

After several years of excellent service as Chairman of the Finance Committee Professor W. Kummer (Austria) is succeeded by Mr. P. Levaux (Belgium). Professor W. Gentner (Federal Republic of Germany) remains Chairman of the Scientific Policy Committee.