

News from abroad

ANTIXI ZERO

The one remaining undiscovered particle in the list of quasi-stable, or so-called 'elementary' particles (those in table 1 of the listing in our May issue — p. 66) has been detected in an experiment at Brookhaven, U.S.A., reported in *Physical Review Letters* on 15 August.

Using a beam of separated antiprotons, of momentum 3.69 GeV/c, from the 33-GeV AGS (alternating-gradient synchrotron), physicists from the Brookhaven National Laboratory and Yale University obtained some 300 000 photographs showing interactions between the antiprotons and protons in a 20-inch (51-cm) liquid-hydrogen bubble chamber. Three photographs were found in which the tracks left by charged particles enabled the physicists to deduce that production had taken place of an antixi particle with no electric charge, the antixi zero.

An antixi zero, produced by antiproton annihilation, leaves no track in a bubble chamber, and the antilambda zero and pi zero into which it decays also leave no tracks. However, in one of the photographs in particular, the positive pion and the antiproton from the decay of the

antilambda were identified, as well as the negative xi also formed by the annihilation. Measurements on the tracks of these particles then established the chain of events, leading back to the production of the antixi zero. The measurements also enabled the lifetime of the new antiparticle to be determined, confirming the expected value of about 10^{-10} second.

Although predicted some years ago, on the basis that every 'particle' has a corresponding 'antiparticle', there is a certain satisfaction in actually 'seeing' an example or two of this rare and somewhat elusive form of matter. What is perhaps more important is that the particles and antiparticles so far discovered now form a complete 'family', with no gaps, and the discovery of any further particles with a lifetime of this order or longer would require the creation of completely new groupings.

NIMROD

The proton synchrotron, 'Nimrod', at the Rutherford High Energy Laboratory at Chilton, U.K., produced its first fully accelerated beam on Tuesday, 27 August, with an energy of 6.5 GeV and intensity of 4.9×10^9 protons per pulse. Within an hour

an energy of 8 GeV had been achieved, and the beam current was later increased to 10^{10} protons per pulse at the design energy of 7 GeV. Development will now be concentrated on increasing this intensity to 10^{12} protons per pulse and preparing the programme of high-energy physics experiments.

Nimrod, which cost some £11 million (135 million Swiss francs), is the second accelerator to be operated by the National Institute for Research in Nuclear Science (N.I.R.N.S.), the organization set up in 1957 to provide for common use by British universities and similar institutions the large and costly equipment needed for fundamental research which is beyond the scope of individual universities.

The accelerator has a single ring-shaped electromagnet, 47.25 metres in diameter and weighing 7000 tons. Its toroidal vacuum chamber is made from epoxy resin reinforced with glass fibre. Protons are injected by a 15-MeV linac, and make about a million revolutions, in rather less than three quarters of a second, before reaching full energy. The accelerator produces 28 pulses of protons each minute at its design energy. (U.K.A.E.A.)

in 1964, would add another 8 MW to this load and obviously allow no possibility of any other extra demands from new buildings or equipment. The new sub-station has therefore been planned, in co-operation with the 'Services Industriels de Genève' and the canton of Geneva, to accept current from a new 130 kV power-distribution line from the generating station at Verbois, and transform it to an 18 kV supply for primary site distribution. Initial operation would make available up to 38 MW, thus solving the immediate supply problem, while later a maximum of 90 MW is envisaged, should this be needed for running storage rings for the synchrotron.

Further round the new road from the East gate, work was also begun in June on the Surface-treatment Building (2). This will be a single-storey building of about 750 square metres floor area, bringing together all the various operations which have to be carried out on metallic and other surfaces. These include such things as sandblasting, polishing and electroplating of large surfaces, as well as more delicate treatments involving photo-engraving and etching. A special section will deal with the production of 'printed circuits' used now in large numbers for the 'wiring' of electronic apparatus. Special drainage and ventilation facilities have had to be provided.

Just out of the picture, at (4), work was begun in June on an extension to the NPA Building, on the new piece of land made available to CERN by the canton of Geneva. Partly an enlargement of the equipment hall, partly new laboratories and offices, the total amount of extra floor space will be about 2500 m². Although the hall will be just a continuation of the existing building, the adjoining office section will be one floor higher than the present one and will also have a basement.

A less obviously visible alteration has been made in the West workshop (5), where an intermediate floor, of reinforced concrete supported on steel columns and beams, has provided an extra 540 m² of working area.

On the other side of the site (7), modifications are being made to the carpenter's shop of the Site and Buildings Division, and in the same area a small annexe is being put up to the SB workshop to provide special facilities for changing transformer oils and other such work. Nearer the road, a third fuel-oil storage tank will be erected next to the existing pair (6), of the same diameter but 15 metres high instead of 10 metres ●