3° K, but cautiously pointed out that they did not interpret this as a temperature. The experiment was being repeated—of necessity, because it contradicts the consistent spectral data from CN, CH and CH^+ reported by P. Thaddeus.

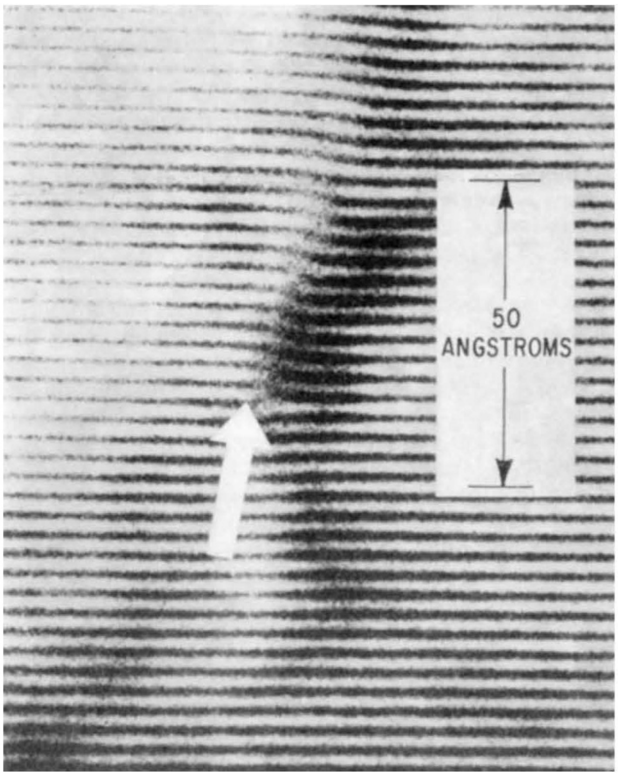
It should not be long before experimental tests of general relativity are sufficiently accurate to sort out different modifications of the theory. R. H. Dicke's observations of the solar oblateness have stood the test of time, but the group delay of radar echoes from Mercury can almost be measured with the required precision and an increase of sensitivity could be obtained by the use of widely separated transmitting and receiving antennas. A second interesting possibility mentioned by I. Shapiro was the use of VLB radio interferometers to detect the gravitational deflexion of radiation. The scheme was already in progress and preliminary measurements on the angular separation of *3C* 273 and *3C* 279 had already been attempted.

Other topics discussed included the isotropy of the 3° K radiation, which currently places an upper limit of 300 km s^{-1} on our velocity through it, the formation of galaxies, and the dubious interior of neutron stars. All in all, it is apparent that astrophysics is an exciting and booming field of activity.

SOLID STATE

Dislocation on View

THIS remarkable picture is one of the clearest yet taken of a lattice defect in a crystal of germanium. The extra half plane of atoms which ends at the point of the arrow can be clearly seen, and a dislocation can be visualized emerging from the page. The picture was taken by Dr V. A. Phillips and Mr J. A. Hugo of the General Electric (US) Research and Development Center, in Schenectady, New York, who used a Philips EM 300 electron microscope.



The photograph was taken by the "two-beam" technique, devised in 1963 by W. C. T. Dowell. In this technique, the central undiffracted electron beam is combined with only one of the many diffracted beams to form an image of the very thin germanium single crystal which is under observation. The picture which results is representative of the edges of the atomic planes. The picture will give particular pleasure to materials scientists, who for years have been drawing and studying diagrams identical with the picture which has now been taken. Dislocation theory, of course, no longer needs experimental confirmation, but the photograph is none the less extremely satisfying.

HIGH ENERGY PHYSICS

Muon Magnetic Moment

AN experiment has just been completed at CERN in which the magnetic moment of the mu-meson, affectionately known as the muon, has been measured with sufficient accuracy to put in question the validity of quantum electrodynamics as a means of explaining it. The factor of fifteen or so by which the CERN experiment betters the previous one of Charpak and others places the observed magnetic moment nearly two standard deviations outside the expected anomalous moment.

The experiment was carried out with the 28 GeV proton accelerator at CERN at an energy of 10·5 GeV. The protons were made to strike a target in the magnetic field and the pi-mesons which were produced in this process then decayed to give the required muons. The muons were stored in a circular path and a series of counters detected electrons produced by their decay. The effect of a magnetic field on the magnetic moment of the muon is to make it precess like a gyroscope. Electronic detectors were arranged so that they accepted only the highest energy electrons, which are those that come from forward decay of the muons. As a result, the counting rate was proportional to the precession frequency and hence the magnetic moment of the muon. A subsidiary experiment was also carried out at CERN to compare the magnetic moments of the positive and negative muon, and the results showed there to be no significant difference within the bounds of experimental error. This was as anticipated, and tends to confirm that the errors quoted are not substantially underestimated.

How then can the discrepancy between the observed value and the anomalous magnetic moment be explained? And does this result throw new light on the differences between the electron and the muon? Although physicists are always cautious of sweeping deductions based on discrepancies of less than a handful of standard deviations, it seems that there are several ways of answering these questions. The quantum electrodynamic calculation contains two terms which may be the cause of the failure, and both of them are proportional to the square of the mass of the muon. Because the mass of the muon exceeds that of the electron by more than 200, this would explain the difference of behaviour of the two particles without having to invoke any esoteric theories.