step in translation instead of or in addition to any transport from the nucleus. And Gillespie *et al.*, not to be outdone, speculate that the particularly large amount of poly A in tumour virus RNAs may reflect some failure in cleavage maturation processes which result from infection by tumour viruses.

Obviously until more data about the function, origin and sequence of poly A tracts in messengers of cell and viral origin are forthcoming these speculations will abound. But with so many groups turning their attention to the hunt for poly A tracts it should not be long before at least some of these ideas can be eliminated. Determination of the sequence of a poly A tract would be particularly instructive and might throw much light on the central question of whether or not these tracts are genetically coded.—From our Cell Biology Correspondent.

MAGNETOSPHERE

Data from Imp 5

from our Magnetosphere Correspondent

THE parts of the Earth's magnetosphere above the polar caps are almost unexplored. It has long been expected that magnetosheath plasma would enter geomagnetic field lines passing near the "neutral point" which appears in theoretical models that ignore the existence of an interplanetary field. This may be even more significant when the interplanetary field is taken into account. Such plasma was reported last year and named the "cusp". The ESRO satellite HEOS 2 is the first spacecraft to have a highly eccentric orbit with its apogee at a high latitude and should give a systematic survey of the neutral point which it passes closely. Meanwhile, some magnetic measurements near the neutral point have been obtained from the satellite Imp 5 (Fairfield and Ness, *J. Geophys. Res.*, **77**, 611; 1972).

Imp 5 was launched in June 1969 and although its apogee is at quite a low latitude it has a near polar inclination. It is on the day side of the Earth in northern summer and its inbound passes have high northern latitudes at the magnetopause. Only data "confidently felt to be within the distorted geomagnetic field" are included in Fairfield and Ness's report, but these measurements fit theoretical predictions with a degree of variability which might be reasonably expected. Outbound passes are at low latitude and show the well known compression of the dipole field. Inbound passes at high latitude show weakening of the field and more variability in its direction, the average direction being roughly that for the dipole. Fairfield and Ness published detailed data for parts of four orbits and they mark the boundaries found by Frank (*ibid.*, **76**, 5202; 1971) from his plasma and energetic particle detectors.

Orbit 5 is characteristic of middle latitudes and resembles observations at low latitudes. The plot suggests, however, that magnetosheath plasma and turbulence extend within the boundary exhibited by the magnetic data, and this situation possibly indicates day side reconnexion.

The magnetometer was saturated in the cusp on this orbit, but the other orbits shown include the cusp and "polar cap" given by Frank. In the magnetic data the polar cap is characterized by quiet, the cusp by turbulence and the field strength is usually depressed more in the cusp than in the neighbouring polar cap. Large fluctuations were observed in the cusp on orbit 4 in spite of a low *Kp* value of 0+. On orbit 9 Frank finds a transition from magnetosheath to cusp, but the magnetic data show no marked change though they are noisy. The changes in magnetic field direction occur in the middle of the cusp.

Orbits 7 and 9 each show a large spike in declination located in the cusp. Fairfield and Ness interpret this in relation to a double layer of field aligned current and compare it with observations on a low altitude satellite (Armstrong and Zmuda, *ibid.*, **75**, 7122; 1970). They find good agreement between the magnitudes of the field perturbations, but the Imp 5 spikes should map into narrower layers than that studied by Armstrong and Zmuda. The signs of the perturbations agree, the current being downward at the higher latitude, so that the electric field in the ionosphere should correspond to an electric potential which is higher on the field line entering the ionosphere at the higher latitude.

FORENSIC SCIENCE

Microscopes and Crime

from a Correspondent

THE forensic scientist's most basic instrument is the microscope. Advances and techniques in forensic microscopy were the subject of a symposium on the microscope in crime detection at Micro 72, the international meeting organized by the Royal Microscopical Society at Oxford Polytechnic on April 10–14.

Working on the theory that "every contact leaves its trace", a common application in forensic science is the comparison of material found at the scene of a crime with material found on, or connected with, a suspect. The types of "material" include hair, fibres, blood, wood, paper, glass, paint and bullets. It was the problem of comparing the firing marks on bullets that led to the construction of the first split-field comparison microscope in the United States in the early nineteen-thirties and commercial production by Leitz from 1935. The two objects are presented to the two halves of the field of view and can be manipulated on separate stages, enabling an immediate comparison to be made of size, colour and structure. The various marks found on fired ammunition were described by Mr J. D. McCafferty (Metropolitan Police Laboratory). Assigning a bullet to a barrel depends on a comparison of the unique rifling marks, which are usually constant over many hundreds of rounds fired from the same barrel.

Mr B. R. J. Morgan (Home Office Forensic Science Laboratory, Cardiff) spoke of the problems of comparison microscopy on other materials. Here the value of the evidence often lies in a positive match between a large number of specimens, which individually may be quite common. With certain speci-

30 Doradus Observed in the Infrared

INFRARED observations which provide a clue to the structure of the 30 Dor nebula in the Large Magellanic Cloud (LMC) are reported by I. S. Glass in next Monday's *Nature Physical Science* (May 1).

The 30 Dor nebula is the most conspicuous object in the LMC at both optical and radio frequencies; Glass has found that infrared radiation from the same region comes from a source 1 arc min across centred on the nebula, which is 25 arc min in diameter. The equivalent radio source seems to be associated with a thermal source 4 arc min in diameter within a non-thermal source 24 arc min wide and an HII region of 45 arc min full width at half maximum. The whole complex is similar at radio frequencies to the centre of our own Galaxy, and the new observations at 1.2 to 3.5 μm provide further support for this idea.

So observations at radio frequencies and at a few microns both now show that 30 Dor and the Sgr A complex at the centre of the Galaxy contain similar thermal and non-thermal sources. If similar results can be obtained at intermediate frequencies there will be considerable justification for regarding 30 Dor as the centre of the LMC, and hopefully further studies will reveal characteristics of 30 Dor and the LMC which will lead to a better understanding not just of that galaxy but also of galaxies in general and our own Galaxy in particular.