which operates without any moving parts—a great asset for remote operation.

Mr J. Plevin (Space Application Division, ESRO) presented a very reasoned case for the provision of an aircraft facility with advanced sensors, for European Earth resource scientists, in preparation for a European satellite programme. Even if a European satellite does not materialize there is still an urgent need to provide these facilities for the research scientists and in view of the costs involved the idea of a "European" facility is most rational and economic.

Mr S. L. Entres (Royal Aircraft Establishment, Farnborough) presented a masterly paper on the applications of orbital remote sensing in which he illustrated the efficiency of the system for the rapid collection of huge masses of information and showed that even at "pilot project", "evaluation" levels people are being drowned in data. He stressed that much more effort must be devoted to data handling and analysis, especially in developing automated systems. This, he argues, should take priority in current and near future remote sensing activity. Professor J. Hannessian (National Science Foundation, Washington) generated considerable interest with his contribution on the international and legal aspects of Earth observation satellites. Aircraft surveys over "alien" territory clearly violate national boundaries, but how high does a remote sensing platform have to be before it can be considered outside national boundaries.

The aim in space and airborne remote sensing operations is, of course, to apply the information collected to a specific problem. The "applications" groups were well represented and were drawn from a wide range of earth and environmental sciences. Mr N. P. Press (Royal School of Mines) spoke about the detection of the toxic effect of metals on vegetation and exploded the widely held (and printed) myth of the relationship between plant disease and chlorophyll content in the analysis of false colour photography.

Two contributions dealt with the problems of producing maps from satellite imagery. Dr O. Kolbl (Swiss Forest Research) was concerned with improving existing maps by the combined restitution of aerial and satellite photographs, and Mr P. G. Mott (Hunting Surveys) presented the viewpoint of the photogrammetrist that enough ground control exists, or could easily be obtained, to permit small scale mapping of the unmapped territories of the world.

Atmospheric pollution at local, national and international levels is a serious and growing problem and there is an urgent need to develop efficient recording and monitoring systems. In this context Dr A. R. Barringer (Barringer Research Ltd) is one of the world's pioneers and he gave a fascinating account of some of the instruments and techniques he is developing for the remote measuring of certain types of atmospheric pollution.

The applications of remote sensing in climatology, vegetation, geology and hydrology were also considered and to illustrate further the broad interdisciplinary nature of the topic Dr W. G. Collins (University of Aston) outlined some of the work which is being carried out in the Remote Sensing Unit where the nine research students are drawn from seven different disciplines.

The symposium highlighted, and several contributors referred to, some of the most glaring defects in the remote sensing activities in Britain: its excessive fragmentation, poor communication and lack of any focal point.

Remote sensing involves instrumentation development, software development and applications, each of which, particularly the latter, cuts across the traditional discipline boundaries. This has resulted in a fragmentation of remote sensing activities in all agencies —universities, research councils, government departments and learned societies. Universities can do little by themselves (although the University of Aston has made a promising start) and although the research councils claim an interest in interdisciplinary research this has not been reflected in their support of interdisciplinary remote sensing research.

GEOPHYSICS

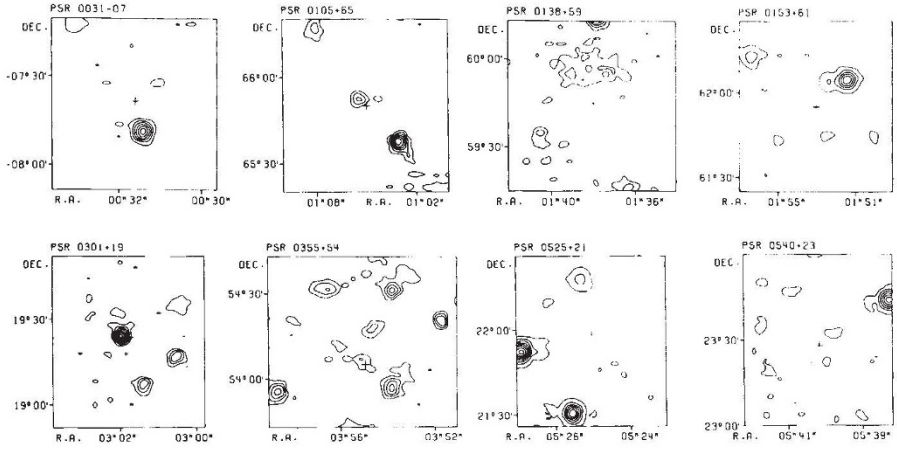
Volcanomagnetism

from our Geomagnetism Correspondent

Of the many potential methods of predicting seismic and volcanic activity, few can have proved more promising in theory and yet more discouraging in practice than that based on tectonomagnetism. It is now well established that when a stress is applied to, or removed from, a rock a small change in the remanent magnetization of the rock arises from the distortion of crystal structure (the piezomagnetic effect). Seismic and volcanic events reflecting changes in subsurface stress within the Earth should therefore manifest themselves as changes in the small part of the local geomagnetic field arising from the permanent magnetism in rocks. Continuous monitoring of the field should then lead to the observation of geomagnetic variations which reflect premonitory stress changes and thus possibly to a prediction of the time and location of an event.

Unfortunately, the phenomenon expected on the basis of theory and laboratory experiment is not easily observed in the field. For one thing, until recently, there have been practical problems associated with the measurement of very small field changes, distinguishing between the piezomagnetic signal and the much greater geomagnetic noise, and the insulation of magnetometers from mechanical vibration.

Continuum Radio Emission from Vicinity of Pulsars



The suggestion that pulsars might possess weak radio haloes has been investigated by Schönardt (see next Monday's *Nature Physical Science*, May 28). His results are disappointing, in that they show no evidence to support the hypothesis, recently put forward by Blandford, Ostriker, Pacini and Rees (*Astron. Astrophys.*, **23**, 145 ; 1973). But they provide an important contribution to the general pool of knowledge about pulsar properties.

In this figure, eight of the nineteen radio maps prepared by Schönhardt are shown. Each map covers about one square degree, centred roughly on the appropriate pulsar. Measurements were made with the Max-Planck 100 m, equipped with an 11 cm cooled parametric amplifier ; contour intervals vary from one pulsar to another, but these eight examples are typical in showing no shell sources associated with the pulsars.