

magnetic storms, but perhaps the most practical application of solar data is expected to be an improvement in the ability to predict or control certain aspects of our terrestrial environment. US weather statistics have already found correlations between solar disturbances and the frequency and intensity of Earth storms, and some theories suggest that climate, earthquake activity and even life pattern and growth rates are directly related to solar activity.

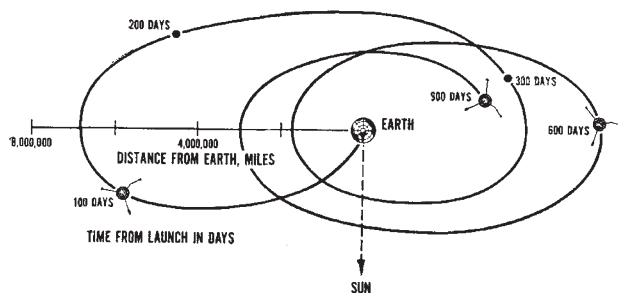


Fig. 1. Pioneer 10 positions relative to Earth for first 2.5 years of mission.

The Pioneer programme has already provided information with immediate practical application. During the Apollo landings, hourly reports on solar activity were sent to Houston to guard against any unexpected arrival of intense showers of protons, and this type of monitoring will become more important as supersonic aircraft fly on the fringes of space. And a geomagnetic storm, forecast six days in advance from solar disturbances picked up by Pioneer spacecraft, took place within three hours of the predicted time.

This mission does not, of course, possess the glamour of manned flights, but it could be just as valuable in terms of results which have immediate application on Earth. The Pioneer programme, if it leads to a clearer understanding of the links between solar activity and the climate on Earth, will strengthen the case for concentrating on unmanned explorations, rather than repetitions of the lunar stakes.

RESEARCH

Who Does What Where?

THE Department of Education and Science and the British Council have again published their annual three volume guide—*Scientific Research in British Universities and Colleges, 1968–69* (HMSO, Vol. 1: Physical Sciences, £3 5s; Vol. 2: Biological Sciences, £3 2s 6d; and Vol. 3: Social Sciences, £3). In spite of its usefulness, the guide is as usual marred by minor irritations and inconsistencies—the fact that some of the entries are out of date, and the infuriating practice in a few cases of lumping all research projects together under the head of a department instead of crediting the individual members of the department. These inconsistencies are perhaps inevitable in a series which has to rely on the cooperation of individual institutions, but the editors could surely smooth out a few of the irregularities. On the grounds of cost, the subject index cannot be expected to be fully comprehensive, but some categories are defined precisely and others much more broadly. One lapse which has persisted from the

previous year is the absence of an index entry for anti-lymphocytic serum which is currently the subject of so much exciting research. ALS cannot be traced under either antibodies or lymphocytes but only under serum (where seven projects are indexed).

In spite of criticisms, however, the guide is invaluable, and it must be wished that there were a similar comprehensive guide to research in progress in Government departments and research institutes. Social scientists are better served in this respect than biological or physical scientists, because the compilers of the social sciences volume in this series, helped by the Social Science Research Council, have continued their useful practice of including some of these and other institutions. It also includes research projects of PhD students. This volume has nearly 100 pages more than the last edition—it includes about 30 more institutions—and with some justification the publishers have increased its price by £1. The first two volumes have also increased their coverage by including more of the designated polytechnics such as the Leeds College of Commerce, the John Dalton College of Technology in Manchester, and the Oxford College of Technology, but with only 52 (Vol. 1) and 39 (Vol. 2) more pages there is less justification for a 30 per cent increase in price.

BRAIN DRAIN

Doctors Departing

A SURVEY of the present whereabouts of medical graduates of Aberdeen University who received their degrees in 1956–58, which was published in last week's *Lancet* (ii, 427; 1969), has once again drawn attention to the large losses of medical graduates. A third of the 186 graduates included in the survey are no longer working in British medicine. Forty-nine of the graduates are now living permanently overseas; thirty-eight of these are emigrant Britons and eleven are people from other countries who were trained at Aberdeen and have since returned to their homelands. Of the emigrants the largest group chose Canada (13), followed by Australia (8) and the United States (6), and only three graduates emigrated and then returned. Eighteen of the emigrants had received some sort of postgraduate qualification before emigrating.

The reasons for emigration given by the twenty-one emigrants who completed questionnaires are all familiar; the GPs reported their frustration with the National Health Service, in particular the size of the executive council lists, the unlimited demands of patients and the lack of access to hospitals. Those who had been in hospital practice described the usual grievances of lack of prospects for promotion, the rigid career structure and the low wages. Emigration has provided not only better facilities and more satisfying work but also more pocket money. Family considerations tinged with a sentimental attachment to Britain kept forty-nine of seventy-five men who had considered emigrating from doing so.

Of the fifty women in the survey, thirty-three who were living in Britain replied. Only four were in full-time medical employment, nine had regular part-time employment, four took occasional jobs and eight had nothing to do with medicine. The married women, of course, hope to return to medicine when their children