

## More than most will remember

*Collected Papers of Sir Harold Jeffreys on Geophysics and Other Sciences.* Vol. 2: *Observational Seismology*; Pp. xxi+697; £20.10. Vol. 3: *Gravity*; Pp. xviii+661; £19.60. (Gordon and Breach, London, Paris and New York, 1975.)

HAROLD JEFFREYS is truly one of the giants of 20th century science, although he ploughed a fairly lonely furrow between the wars at a time when bright young men were expected to go into atomic and nuclear physics. But now geophysics is the most fashionable of subjects and many of its practitioners rely, consciously or unconsciously, on the foundations that Jeffreys built. His writings both on geophysics and beyond (even to an appraisal of the psychoanalytic significance of a label on a beer bottle) have been both prolific and a delight to read. The seven textbooks are easily accessible, but the rest is scattered around more than 40 different journals. So is there maybe a case for the publication of his collected papers?

For all that Jeffreys has published widely, four fifths of the papers in these volumes (of the six that will ultimately appear) come from the *Monthly Notices of the Royal Astronomical Society* and its *Geophysical Supplement* (later the *Geophysical Journal*). (There were times when Jeffreys practically kept the *Geophysical Supplement* going single-handedly!) Thus, if you have access to a complete run of these two journals you are paying a lot for the other one-fifth of his published papers. And the editing is relatively slight.

One of the fascinations of science is the way things age rapidly—particularly the interpretation of observations; it is, then, of interest to learn what, in retrospect, scientists would stand by, and what they think is no longer tenable. For instance, I should have liked to know how Jeffreys thought the J-B tables of 1940 stood now that there are newer tables by Herrin (at least, I do know, but I wish he'd put it in print). But where Jeffreys does add a modern footnote—and this is infrequently—it is brief and not very helpful. For example: "Some stations, mainly southern ones, received much higher reliabilities when the ellipticity of the Earth was allowed for", at the end of a 20 page paper.

One footnote, though, is pure Harold Jeffreys and touches on the question of the WKB approximation. In a 1969 note on a section in a 1915 paper, Jeffreys writes "This was my first discovery of what is best described as the Green-Liouville approximation. I

rediscovered it in 1923, having twice forgotten Green's equivalent treatment of tidal waves in a canal of slowly varying sections". He has forgotten more than most of us will remember.

Alas, the price of the complete set is such that the only geophysicists with that sort of money to spare are not those who will think of acquiring these volumes. And librarians can with justification say that all the papers are accessible somewhere—except perhaps the beer-bottle one.

David Davies

## Marihuana

*Marijuana: Effects on Human Behaviour.* Edited by Loren L. Miller. Pp. xiv+405. (Academic: New York and London, December 1974.) \$29.50; £14.95.

*The Use of Marihuana: A Psychological and Physiological Inquiry.* Edited by Jack H. Mendelson, Michael Rossi and Roger E. Meyer. Pp. x+202. (Plenum: New York and London, 1974.) £17.00; \$44.00.

OVER the last few years, research on cannabis has burgeoned astonishingly. This has not come about by the slow process of natural evolution, but very obviously because grant money has flowed in that direction, particularly in the United States and Canada. For anyone with a really well developed eye for a bandwagon, the ultimate would now be to obtain grant money for a study of the social and political determinants of this granting. The story would provide a fascinating case-study.

When, for basically political reasons, a great deal of research money is suddenly pushed in a particular direction the prognosis is always uncertain—the result may be a lot of mediocre research or, alternatively, rather good things may happen. With research into the effects of cannabis the outcome has been of the latter and more fortunate kind. In several different scientific areas cannabis research is beginning to have about it a modest feeling of excitement.

The range of this research and something of the promise, is well conveyed in the volume on cannabis which is edited by Dr Loren Miller. Edited volumes on cannabis are now appearing thick and fast, but so far this is undoubtedly the most interesting and authoritative array of papers on this topic to have been put together in one book. The 14 chapters each either report the contributor's original research with adequate delineation of context, or review a particular sector. The laboratory dissection of the psychological aspects of cannabis is the theme

of several different chapters, and one feature of recent work is that experiment on the drug's interference with complex mental functions is providing a useful tool for basic study of those types of function. Chapters on the influence of cannabis on memory and on attention, nicely illustrate this development. Other contributions at the laboratory end of the spectrum deal with neurophysiological research and possible interference with neurotransmitter mechanisms; again these are not just 'drug studies' but use of a particular substance as an investigating tool. We have moved on from the days when study of CNS function was largely based on physical ablation of its parts, but the analogy is close.

This book also deals with some more social-medical questions. A chapter on the drug and psychiatric illness, gives a particularly sensible appraisal of issues which have not always attracted the coolest discussion. Progression to other drugs, cannabis and violence, and cannabis and car driving, provide the matter for further chapters. Too easy an acceptance of the inevitability of that approach to research which is always one removed from the social reality (drinking experiments, as it were, in the simulated laboratory bar rather than at the Pig and Whistle), receives a healthy jolt from an account of driving research in which experimental subjects drove round town in dual control cars after smoking, with careful real-life observation being backed by physiological measures made at the same time.

In *The Use of Marihuana* Professor Mendelson and his colleagues give an account of a project which yields a mass of data on a number of separate aspects of the drug's effect on the human subject. Even leaving aside the specialism of the content, this is a book which deserves notice as a superbly competent piece of scientific investigation. Some years ago Mendelson and his collaborators made an important contribution to alcoholism studies by observation of, and multiple measures on, alcoholics drinking in an experimental ward, which provided an operant-conditioning paradigm: the same type of design has now been applied to the influence of cannabis on man. In tolerant individuals, marihuana intoxication sustained over a period of 3 weeks and with dose on occasion going up to 200 mg THC a day, produced remarkably little disturbance. As the investigators themselves say, their work leads to no closure of the cannabis debate but only points to the necessity for "more sophisticated questions". Any assertion that cannabis is a drug which cannot produce tolerance, is after this study certainly no longer credible. Griffith Edwards