

declared that the government accepts, in general, the Swann committee's proposals for the control of antibiotics but that "some of the committee's more detailed recommendations and longer term proposals on research and veterinary epidemiology will need further study". Manufacturers will be given a reasonable period of grace to run down feed stocks which contain the prohibited "therapeutic" antibiotics; these include penicillin, the tetracyclines, tylosin, the sulphonamides and certain nitrofurans.

OPEN UNIVERSITY

How to Get a Degree

THE Open University will accept applications from prospective students in January 1970, and will begin in earnest a year later. It seems that the plans have been made for a comprehensive selection of courses, and the student will graduate by building up a number of credits, each of which is awarded for successful completion of a one-year part-time course. Six credits are needed to qualify for a BA degree, and eight for a BA degree with honours. Because no more than two courses may usually be taken in any one year, the minimum period for achieving a degree will be three years, but it is expected that many students will take courses one at a time over several years.

Tuition will consist of a system of correspondence courses, radio and television programmes, a summer school, and regionally organized counselling. Students will probably spend about ten hours a week on their studies, including an hour's television and radio courses. The first year will be spent on "foundation" courses, which will be repeated every year for new students, while successful students will carry on to second, third and fourth level courses. Two credits from foundation courses must be achieved before a student can qualify for a degree, and an honours qualification will include credits from third or fourth levels. Apart from these restrictions, a student will be free to choose his courses, and he will therefore be able to combine a variety of subjects, for example, science and humanities. This is one obvious advantage that the Open University can offer, compared with conventional universities.

The university later hopes to introduce postgraduate and post-experience courses, and also "updating" courses which will be intended for people wishing to keep pace with advances in their professions. In addition, already qualified teachers will be awarded one credit for every year that they have spent in a college of education, thus enabling them to qualify for a BA degree on successful completion of only three courses.

Students will be accepted for the 25,000 places that the Open University hopes to have available, on the basis of their occupation, age, preparedness, region, and the subjects which they hope to study, but Dr Walter Perry, Vice-Chancellor of the Open University, said that the weighting given to each of these criteria could not yet be determined. The cost of qualifying for a degree will vary according to whether a student takes one or two courses a year. There will be an initial registration fee of £10 and a single foundation course will cost £40. This fee will be payable in April, however, to allow students, who find that they do not want to carry on, to drop out before they have committed themselves financially. Second, third and fourth

level courses cost £20, and it is therefore possible for a student to acquire a degree in three years for £140, or a BA with honours for £180, inclusive of accommodation fees at the summer schools.

SEISMOLOGY

Setting the Moon Ringing

from our Geophysics Correspondent

IT is, of course, too early to do more than say "whoopce" and jump on the speculative bandwagon after the remarkable results from the lunar seismometer last week. We have been lucky in getting a comprehensive press coverage so soon, with comments from Drs Latham, Ewing and Press, but newspaper descriptions can only titillate the imagination—all geophysicists and planetary physicists will be itching to see the records for themselves. The hard facts that we have so far are that when the ascent stage of Intrepid was rammed back to the Moon's surface, it produced a crater twenty feet across and two feet deep, some forty miles from the Apollo 12 seismometer. The impact generated seismic waves which continued for thirty to forty minutes.

On Earth, this would be unthinkable. An explosion of modest size on the Earth's surface—perhaps a few tens of tons—could simulate this event, but a recording station a mere forty miles away would record signals for perhaps a minute or two as the surface waves passed by. After that there would be silence—and not just because the instrument would be not sensitive enough but because the next arrival of energy would be an hour or more later, from surface waves that had gone round the Earth the other way, and these would be so heavily damped by imperfections in the elasticity of the Earth (which has a Q between 200 and 500) that for practical purposes the waves would be completely blotted out.

How is the Moon different? If we assume as a starting point that the elastic properties are comparable, surface waves should get round the antipodal path much more quickly because the radius is smaller. These could certainly contribute to the signal, provided the an-elastic properties are not as marked as on Earth. For example, the presence of a low seismic velocity layer on Earth, probably the result of partial melting between 100 and 300 km, is widely believed also to lead to a low Q layer. This region of high seismic wave absorption dominates the attenuation of surface waves. On the Moon, things may be different. If there is no partial melting near the surface—and there is no reason why there should be an analogy with the Earth—then it is possible that Q is high throughout the Moon—maybe as high as a thousand. The Moon is then nearly as resonant as a bell, and any small disturbance will set it ringing for a very long time.

It would be foolish, however, to state at this stage that the results unequivocally favour the "cold Moon" theory, as one or two enthusiasts have already claimed. Much of the Earth's crust has a Q in the region of a thousand and the low Q zone may be a coincidence of thermal conditions, pressure and petrology. It is impossible to say at this stage whether the apparent absence of lunar absorption has any bearing on internal lunar temperatures.

Without the seismograms themselves, we can only