

inflation in the years ahead. That should make possible a sensible programme. A more serious need is that NASA should be provided with more effective means for defining objectives as it goes along. Where basic science is concerned, for example, it would probably have been possible to avoid some of the mistakes of the past few years if NASA had been more closely in a relationship with the scientific community. Some of the Biosatellite experiments would have had a poor showing if they had been put through the kind of intellectual mill to which academic research proposals are usually subjected, and is it really sensible to go looking for magnetic monopoles in samples of moon dust recovered from the Moon this week? In this field, as in others, the President's advisers could do a great public service by helping to provide NASA with a wider base in the rest of the community. Such a move should also be more acceptable now that the immediate task has been accomplished.

Implications of Spaceflight

So does it follow that NASA must become—as many other public organizations are—the prisoner of a network of advisory committees? That is the wrong end of the telescope. There is no reason why the organization should not be strengthened as it is changed. Having made space possible, as it were, somebody must now show what it is for. Much of the past criticism of the way in which things have been done stems from the willingness with which NASA has echoed the surprisingly irrational declaration with which President Kennedy declared that there should be a journey to the Moon. The trouble is that the recipe will not work more than once. What is to take its place? Much of the pleasure in the first successful landing has stemmed from the hope that it will now be possible to change the perspective with which familiar terrestrial problems are regarded. Will this be true? Will it now be easier for rival nations to sink their differences, for example? Will disarmament be easier? Will poverty, national and international, now be less respectable? History provides no solid ground for thinking that the pendulum will now swing right over. The most cheerful precedent of all may be the discovery of North America, for there, after a long interval which is almost best forgotten, there did emerge an enlightened means of government, that which has made it possible to build the Apollo programme. So can the builders now give substance to the hope that this is also a turning point in history? Dr Paine has been talking of the ways in which the doings of his agency may be able to spread all kinds of benefits elsewhere in the world than the United States, and it is plainly the case that European science has been helped along significantly by what has happened in the past few years. For many people, however, the acid test will be the extent to which it is now possible to work out some kind of collaboration with the Soviet Union. One gigantic programme of exploration may be justifiable, but two can only be a kind of folly.

Dr Paine is also the most intelligent spokesman so far for the belief that the arrival of spaceflight will work an intellectual transformation comparable with revolutions now attributable to Columbus, Galileo, Newton and Darwin. There may be much in what he says. Certainly there is no denying that developments like these can profoundly alter the character of intellectual life. Certainly, it would be dangerous at this stage to dismiss everything that has been happening as a futile prank—a way of spending large sums of public money. It is too soon to know. Yet there are some influences which argue that spaceflight is rather a part of an intellectual revolution than an entire revolution on its own account. It will be a long time before the range of the spaceships catches up with the boundaries of that part of the universe of which there is already an understanding of sorts. It may be different when the first discovery is made of living creatures on some other planet, whenever that may happen. To say all this is not to crab spaceflight but merely to assert that it is one of those developments whose influence will depend on the use which is made of it. Nuclear energy is in the same case, although spaceflight has the advantage that there are no obvious military applications. No one can deny that Armstrong and Aldrin have given the enterprise a splendid start, but it is only a beginning.

MOON ANALYSIS

Enzymes at Houston

ONE unexpected beneficiary of the Moon Show was Smith Kline Instrument Co., whose 'Eskalab' clinical chemistry system has been chosen by NASA for analytical work associated with Apollo 11's lunar samples. This news seemed to have come as something of a surprise to Smith Kline itself when it was first released a few weeks ago.

There are several clinical chemistry systems available now for the analysis of blood glucose, serum enzymes and the like, and they range from automated monsters which look after themselves for hours to the conventional trio of spectrophotometer, technician and pipette. Smith Kline's 'Eskalab' is somewhat nearer the latter end of the scale, but it embodies several new features. The company believes this instrument commended itself to NASA because, first, it is small and can easily be sterilized and operated in a vacuum chamber and, second, because it is flexible and can be changed from one assay to another in a matter of seconds.

Optically, the 'Eskalab' system comprises a solid state spectrophotometer, an interference filter as monochromator, a double light beam generated by a chopper mirror and an extended range photomultiplier tube. All this is fairly conventional, and the novelty resides in the way the basic spectrophotometer has been adjusted to the needs of a hospital laboratory. Specially formulated reagents, cuvettes and pipettes come in a package deal with the machine, and together they take the Principle of Disposability to new lengths. The reagents come as stabilized tablets, one tablet per test, while the Lucite cuvettes—transparent down to