during weightlessness will be the first ever made by NASA. The brain will be monitored for the four types of brain waves during sleep, wakefulness, anxiety and when the monkey performs his two tasks, to test short term memory and eye–hand coordination. The monkey will have spent 18 weeks learning these tests, which involve matching four symbols and pushing a button when a hole concealed by two sectored disks rotating at different speeds appears in line with the button once every fifty-six revolutions.

One criticism of manned flights has been that NASA throws away valuable physiological data by jettisoning astronauts' urine, but in this experiment the monkey's urine will be analysed for calcium, creatine and creatinine during the flight by an automatic analyser and some will be stored. All the faeces will be returned to Earth and the flight should provide data on net calcium and nitrogen losses because the food intake will be known precisely. Unlike all previous satellites this will be the first with a two-gas atmosphere. The monkey will be breathing 80 per cent nitrogen and 20 per cent oxygen at sea level pressure of 14·7 pounds per square inch.

It is hoped that the satellite will be recovered after its 469 orbits by mid air pick up, but if that fails it will come down in the Pacific. At this stage it would be churlish to wish anything but success to the satellite, but whether the biosatellite programme should be continued is another matter. There is no case for wasting money on satellites similar to Biosatellite II and it is arguable whether putting a monkey in orbit for 30 days will yield the sort of information that is needed to assess the hazards of prolonged space flight. Surely the Biosatellite programme, if there is to be one at all, should be confined to experiments with primates in orbit for periods at least an order of magnitude greater than the length of an Apollo flight.

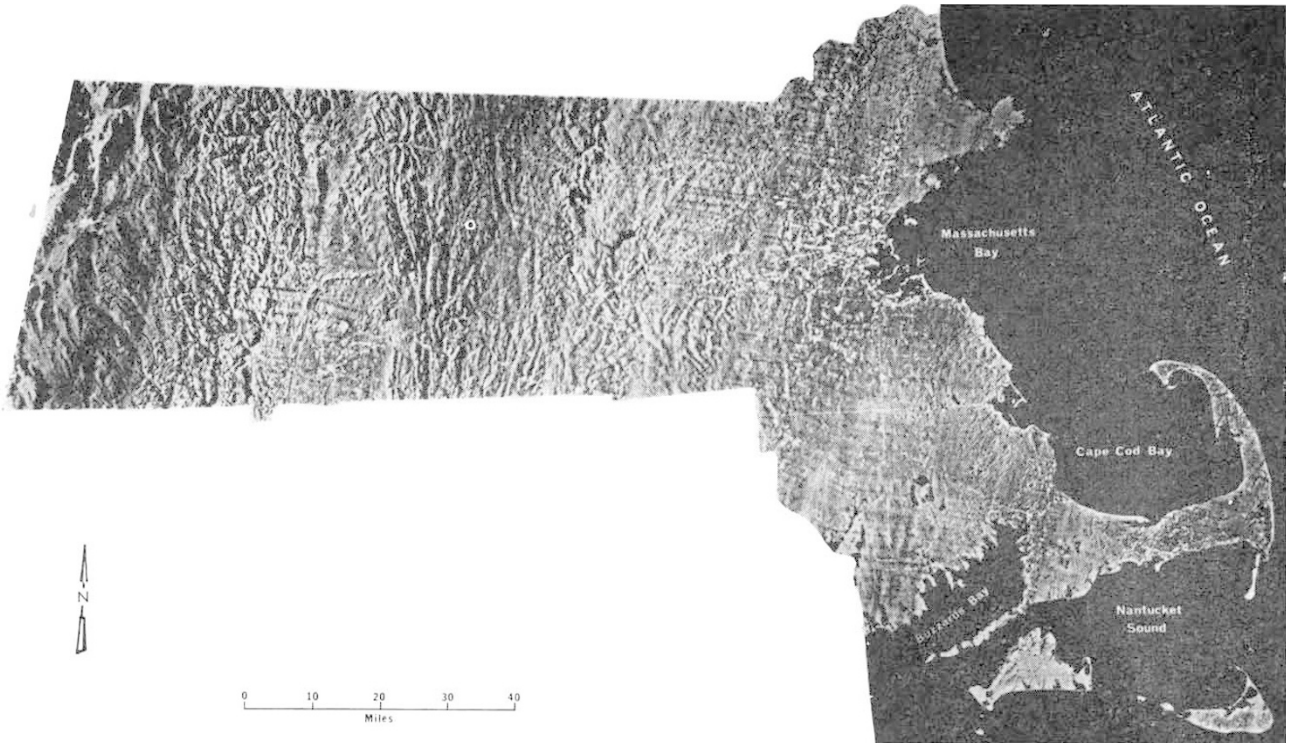
MAPS

Massachusetts by Radar

from our Geomagnetism Correspondent

ONE of the first practical results of a United States programme to evaluate the usefulness of radar and remote sensing in general in studies of the Earth from space is a unique radar map of the entire Commonwealth of Massachusetts. The map is actually a mosaic made up of fifteen-mile wide strips parallel to the Berkshire and Taconic Mountains, each obtained with airborne radar operating at an altitude of only 7,000 feet. The immediate aim of the exercise, which took three weeks to complete, was to determine whether the new view would give additional information which could not be obtained from conventional airborne photography, but without the expense of an Earth satellite. The hope is that by enhancing the topography, the geological relationships betwe n folds, fractures, glacial deposits and other surface features will become more apparent over a wider area.

Although instigated by the US Geological Survey in cooperation with the US Army and the National Aeronautics and Space Administration, the work was done under contract by the Grumman Aircraft Engineerin; Corp. Unfortunately, none of these organizations has yet discovered that geology abhors the straight line. In common with geological map makers during the past century they are mesmerized by those political abstractions—state boundaries.



View of the Commonwealth of Massachusetts compiled from radar images obtained at an altitude of 7,000 feet. The topography is accentuated in comparison with views from conventional airborne photography, thereby revealing major folds, fractures and glacial deposits which might not otherwise have been observed. (Photo : US Department of the Interior, Geological, Survey.)

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