general, to proteolysis is, of course, a long-established principle.

It may be noted that normal proteins are also catabolized, though slowly, in cells in stationary phase, presumably to provide an amino-acid pool for the next bout of synthesis. The process of eliminating defective proteins occurs with equal efficiency in growing and stationary cells, and may be subject to a quite different mode of control. The suppression of the degradation process by oxidative phosphorylation inhibitors suggests that it may involve an energy-consuming ATP-regulated step.

CONSERVATION

Reconstructing Nature

from a Correspondent

THE terms conservation and preservation were for long virtually synonymous in the minds of British ecologists, but recently it has become increasingly recognized that conservation must be an active rather than a passive process. This shift in ecological thinking is partially the consequence of the recognition of the impact of man on the environment and also of the realization that nature untended can produce a uniformity of habitat which man finds uninteresting. Thus conservation has come to mean management and management presupposes a value judgment as to the direction in which control is to be exercised.

The desires and aims which underlie management programmes are varied; often they seek environmental stability, sometimes high productivity. In the nature reserves of Britain, however, one high priority has been the maintenance of species diversity, which in turn implies habitat diversity. In the current issue of *Biological Conservation* (**4**, 135; 1972) M. Rawes and D. Welch of the Nature Conservancy describe some experiments concerned with increasing floristic diversity on the Moor House National Nature Reserve in Westmorland.

This upland area, in common with most hill regions of Britain, is poor in plant species, a poverty which may well have resulted from centuries of heavy grazing by sheep and cattle. A further problem is that many plant species which seem to be potentially capable of survival under such conditions are now extinct in the area. In order to see if there was a relation between grazing and the paucity of plant species at Moor House, sample plots which excluded grazing animals from the vegetation on a variety of soil types were set up fifteen years ago. Several upland plant species which now have restricted distributions were also introduced into the "exclosures". A recent survey of these plots, now reported by Rawes and Welch, shows that many of the introduced mountain plants thrive at Moor House in the absence of grazing, suggesting that their demise may well have been caused by domestic animals. Other plants, however, have failed to establish themselves because of competition from coarse grasses and sedges which have also benefited from the lack of grazing.

Fifteen years is a relatively short time in terms of the development and maturation of an ecosystem and it is possible that more species will be eliminated as climax vegetation is achieved. At present it is not known what this climax will be in the absence of sheep, but it is likely that either dwarf shrubs or coarse herbs will assume dominance and this could lead to further extinctions among the introduced species.

Besides the interest of this work in reconstructing the "natural" vegetation of the North Pennines, it brings to the fore the question of policy in reserve management. By the local exclusion of grazing and the introduction of a flora from another geographical region, habitats can be diversified and both the attractiveness and the interest of a nature reserve are thus increased. But should this be the highest aim? Having accepted man's obligation actively to manage reserves, should limits be set to the extent of his biotic manipulations?

The value judgments demanded by these questions are fundamental to the concept of conservation.

PALAEOHYDROLOGY

History of the Black Sea

STUDIES of the distribution of oxygen and isotopes in organic matter from a sediment core suggest that the Black Sea was a brackish freshwater lake up until 9,000 years ago. The core ($15 \times 15 \times 600$ cm), one of several collected during the cruise of RV Atlantis in the spring of 1969, has been analysed at Woods Hole Oceanographic Institution by R. G. Deuser, who has found that it covers the past 17,000 years of the sedimentary history of the Black Sea (*J. Geophys. Res.*, **77**, 1071 ; 1972).

The core, like others from the Black Sea, is divided into three easily recognizable layers: first, a series of alternating thin light and dark layers of high carbonate content (coccolith ooze); second, a dark region rich in organic matter (called sapropel); and at the bottom a series of light and dark bands containing rather less carbonate and organic material (lutite). The beginning of the top zone is date at 3,000 yr BP, and that of the middle zone at 17,000 yr BP. But why were there abrupt changes in the type of sediment being laid down at these dates?

Deuser has tackled this problem by analysing $^{18}O/^{16}O$ and $^{13}C/^{12}C$ ratios throughout the core. In carbonate samples, the ratio of oxygen isotopes is roughly constant except in the upper 1.5 m of the core, above which there is a very rapid increase of ^{18}O. Carbon isotope ratios from the same carbonates show a more complex variation with

Enzyme of a Superphage

THE bacteriophage PM2 which lives on pseudomonads may not yet be as familiar to the spectators and practitioners of molecular biology as QB, R17, T4 and the other coliphages, but there is every reason to think that it soon will be. PM2 seems to have more or less everything a molecular biologist could ask for: it consists of a covalently circular, double stranded DNA molecule in an icosahedral particle with four species of polypeptide, one of which is a glycoprotein and, most importantly with an internal lipid bilayer, a membrane.

In short, PM2 is a bacteriophage which has many of the structural features of the enveloped viruses which infect animal cells, and as Datta and Franklin report in next Wednesday's *Nature New Biology* (April 5), like the enveloped animal viruses, PM2 phage particles apparently contain a nucleic acid polymerase activity.

According to Datta and Franklin, when highly purified PM2 particles are exposed to a non-ionic detergent, an essential step, and then incubated in a polymerase assay medium containing Mn^{2+} and the four ribonucleoside triphosphates an acid precipitable RNA is made. The synthesis of this RNA is blocked by incubating the disrupted phage particles with DNAase which indicates the phage DNA is the template from which the RNA is transcribed; the polymerase activity chromatographs with the PM2 phage particles.

The relationship between the RNA made by the phage polymerase and the phage DNA has yet to be established by hybridization experiments. Likewise the origin of the polymerase, whether it is a bacterial rather than a virus-coded enzyme, has still to be determined as has its function during the phage's replicative cycle. But that PM2 particles contain, internally, a DNA dependent RNA polymerase seems beyond dispute, and the parallels between this phage and the enveloped animal viruses become even more striking.