

ANTARCTIC SCIENCE

Brief Reports from the Literature

Triassic Tetrapods from Antarctica: Evidence for Continental Drift

During the austral summer of 1969-1970, bones of Lower Triassic vertebrates were excavated from coarse quartzose sandstones forming stream channel deposits of the Fremouw Formation at Coalsack Bluff, in the Transantarctic Mountains of Antarctica. This is the first assemblage of fossil tetrapods of significant geologic age to be found on the Antarctic Continent. The fossils include labyrinthodont amphibivians, presumed thecodont reptiles, and therapsid reptiles, including the definite genus *Lystrosaurus*. This genus is typical of the Lower Triassic of Southern Africa, and is also found in India and China. *Lystrosaurus* and associated vertebrates found in Antarctica were land-living animals; therefore their presence on the South Polar Continent would seem to indicate the contiguity of Antarctica, Africa and India in Early Triassic times.

from *Science*, 169, 1197, 1970

Ice Caps – Selenium Pollution?

From the purely scientific point of view the relative permanence of the major ice caps is one of their most endearing properties. For much of the ice which formed perhaps many thousands of years ago still lies buried beneath subsequent annual layers, each of which is in some way typical of the age in which it was produced. Each layer will, for example, have sampled the atmospheric fallout appropriate to the time of its formation. The analysis of dated ice samples thus means that today's atmospheric pollution can be compared with that of the recent past or even with the "standard" atmosphere before the industrial revolution. As a result, it is now known that the quantity of sulphur entering the atmosphere as a consequence of fossil fuel combustion is about the same as that arising from natural causes such as volcanic activity and the oxidation of organic matter.

Although sulphur may be the most severe of the polluting chemicals, what of lesser elements? An ice sample analysis of 14 different ages from 800 BC to the summer of 1965 shows that selenium, which is also emitted during the burning of fossil fuels, has not entered into the atmosphere to the same extent as sulphur, implying that selenium hardly circulates at all.

from *Nature*, 231, 218, 1971

Glacier Sounding in the Polar Regions

For many years radio echo sounding techniques have formed an important part of the scientific programme of URSI (International Union of Radio Science) and its national committees. Such techniques have been used with success in the investigation, for example, of the troposphere and of the characteristics of the ionosphere on a world-wide scale as well as its vertical structure.

Until now, URSI has not been particularly concerned with the sounding of glaciers and ice sheets by means of radio waves, but notable progress in this field has been made in recent years in several countries that are interested in surveys of the Arctic and Antarctic regions. There are certain obvious similarities between the propagation of radio waves in ice and in non-ionized media. For this reason, an informal link has been established between URSI and the Scientific Committee on Antarctic Research, SCAR. Besides the use of radio waves for sounding glaciers and ice sheets, the possibility is being considered of investigating the characteristics of pack ice by illuminating the ice with radio waves and studying the radiation scattered from the rough surface. This technique is already being developed for making surveys of crops on land and the characteristics of ocean waves.

from *URSI Information Bulletin*,
no. 175, 21, 1970

Observations of Ice Stalactites in McMurdo Sound

Dayton and Martin have reported observations that have been made of ice stalactites with lengths of 1,5 to 6,0 meters and diameters of 10 to 25 cm, growing under pack ice in Antarctica. These stalactites form channels through which brine drains from the ice to the water. This has important implications for studies of the natural desalination of sea ice. Little is known about the way in which sea ice becomes less salty; furthermore, most models of this process take place far too slowly to account for the observed rate of salt loss. The presence of these channels must certainly be considered in future models of the desalination process.

from *Journal of Geophysical Research*,
76, 1595, 1971