

The relation of cyanide to breakage is, however, complex, for when X-rays are used in conjunction with the other treatments, the effect of cyanide with oxygen disappears. Instead, there is an effect with cyanide in the absence of oxygen. These irradiation results will be the subject of a later report.

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Living and Fossil Pollen from Macquarie Island

THE use of palynology to investigate the ancient floras of antarctic and subantarctic regions and to aid in explaining the present distribution of the living flora has been largely ignored. Auer¹ made use of pollen analysis to describe the fluctuations of forest and steppe vegetation in Tierra del Fuego in postglacial time. Cookson² described the pollen occurring in the tertiary lignites of the Kerguelen Archipelago. So far as I am aware, no workers have undertaken similar studies in any other part of this zone.

Macquarie Island (lat. 54° 30' S., long. 158° 57' E.), volcanic in origin, dates back to Early Tertiary or Middle Mesozoic time. It has been much reduced in size by block faulting and has undergone extreme glaciation during the last Ice Age. Fluvio-glacial deposits, considered by Mawson³ to be postglacial in age, are fairly common and include well-developed bands of lignite.

While a member of the 1951 Australian National Antarctic Research Expedition based on Macquarie Island, I was able to obtain a series of lignite samples for examination. By extraction of pollen by the acetolysis method of Erdtman⁴ and by comparison of the types discovered with those of the existing vascular flora (some thirty-eight species of grasses and small herbs), it has been possible to show an apparently complete disaffinity between the past and present vascular floras of the island. This finding strongly suggests that the lignites represent the remnants of a preglacial flora. Altogether seventeen main fossil pollen types were found, and it is of interest that these did not include *Nothofagus* or Gymnosperm-type pollens.

During the Ice Age, when the area of land in the vicinity of Macquarie Island was much greater than

it is to-day, it is probable that, notwithstanding the severity of the glaciation, parts of the land mass were capable of supporting plant life. Such conditions exist at present in several parts of the sub-antarctic zone. With the recession of the ice sheet, it is reasonable to assume that the limited plant life began to colonize the freshly exposed land-surface. At the time when faulting and subsidence were practically complete, it is probable that small plant communities were able to survive in more favourable sites on the now much smaller land mass. Those communities may have formed the bands of lignite still preserved at Macquarie Island.

With the land mass greatly reduced in size, a reversal of conditions might readily result in complete extinction of the remnant flora. That such a reversal may have taken place is indicated by the fact that the lignites were found to be covered with considerable layers of fluvio-glacial rubble. Should this explanation be correct, then the fossil pollens may be closely related to the Tertiary floras of the Antarctic.

It is of interest that no definite affinities could be found between the fossil pollens of Macquarie Island and those described by Couper⁵ from New Zealand. Although he has recorded compositous grains in deposits ranging from Miocene to Recent in age, without detailed descriptions it is not possible to decide whether any of these are identical with those occurring in the lignites of Macquarie Island.

A search of the available literature^{4,6} has shown that the pollen of many species of the antarctic vascular flora has not been described. Until such descriptions become available, the identification of recent fossil pollen from this zone must remain uncertain.

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A Direct Method for the Measurement of Cerebral Blood-flow

THE blood-flow through the rostral and parietal parts of the heparinized cat's brain has been measured by cannulating the sagittal sinus. This flow has been correlated with the systemic blood pressure and the electroencephalogram.

After longitudinal craniotomy in the midline, the sinus was ligated at its caudal end. On the rostral side of the ligature a thin polyethylene catheter was introduced into the sinus. The blood was directed to an electric drop recorder, connected with an 'ordinate recorder' which operated a galvanometer. The blood was then returned to the animal by intravenous drop infusion. The craniotomy interrupted the most