cotton cultivars. This may be partly due to the ability of 'resistant' walls to bind rapidly more PG than 'susceptible' walls, and the release of extra proteins, including peroxidase and IAA oxidase (both of which may be involved in symptom expression) from susceptible walls by PG.

Intriguing results were reported on host–symbiont interactions in which recognition and attachment of compatible rhizobia is the first stage before infection and nodulation of root hairs. Most evidence implied that recognition may depend on interactions between root lectins and bacterial surfaces. For example, W. D. Bauer (C. F. Kettering Research Laboratory, Ohio) found that soybean lectin only binds to living cells of symbiotic strains of *R. japonicum* and not to non-symbiotic strains, although there were some exceptions reported by J. Paxton (University of Illinois) and F. B. Dazzo (University of Wisconsin). Albersheim's results implied that the active bacterial surface component is LPS, as lectins from four legume species only interacted with the LPS of their corresponding symbionts. These lectins also had enzymic activity (against LPS) which may be a prerequisite for infection as intact LPS of *E. coli* elicits phytoalexin production; thus lectins may provide not only a physical linkage between surfaces but could trigger other critical events including a localised swelling of bacteria and decrease in respiration rate. Dazzo extended these studies using immunochemical techniques and found a surface antigen unique to infective strains of *R. trifolii* which cross reacted with antigens on roots of its symbiont clover; mutation to loss of infectivity resulted in loss of the antigens. A surface protein from clover roots, trifoliin, is specifically able to bind to the polysaccharide antigen and to agglutinate infective cells, and this probably explains specific adsorption by providing a bridge between the clover and rhizobial antigens. □

Antarctic ice and desiccation in the Mediterranean

from A. Hallam

ONE of the more spectacular results of the Deep Sea Drilling Project has been the confirmation that the deep Mediterranean basins are underlain by a thick layer of apparently shallow water late Miocene (or 'Messinian') evaporite deposits of the type previously known from neighbouring land areas such as Italy. These evaporites are covered by Pliocene muds containing microfossils indicative of deep water conditions. For several years widely differing views have been put forward to account for such a peculiar deep sea occurrence. Hsu and his associates have argued that the northward convergence of Africa on Europe effectively cut off, about 6.5 million years ago, a series of deep topographic depressions in which, following desiccation, halite and calcium sulphate salts were precipitated in shallow salt pans many hundreds of metres below ocean level. Following the opening of the Straits of Gibraltar in the early Pliocene, Atlantic waters cascaded in to fill the basins and restore more or less normal oceanic conditions. Another school of thought rejects this interpretation, maintaining that the deep sea evaporites were originally deposited close to ocean level and occupy their present position as a consequence of substantial post-Miocene tectonic subsidence.

One means of deciding between these alternative hypotheses is to examine microfossils from deep sea core samples taken from the normal marine deposits directly below the evaporites. If these fossils are closely related to groups known to live at great depths in the present world ocean then it becomes difficult to argue that a shallow Miocene sea dried up and the present Balearic, Tyrrhenian, Ionian and Levantine basins were created by subsequent tectonic subsidence. In the proceedings of a micropalaeontologists' symposium held in Tunis (special issue of *Palaeogeography, Palaeoclimatology, Palaeoecology*, **20**, 1/2; July 1976), Benson reports on ostracods and foraminifera obtained from sub-evaporite core material in the Balearic Basin, which appear to indicate unequivocally water depths in excess of 2,000 m. Similar microfossils have been found in contemporary sediments in the Guadalquivir Basin of southern Spain and suggest a continuous oceanic passage through that region from the Atlantic to the western Mediterranean in pre-Messinian times.

Most of the symposium was devoted to discussing the profound effect that the so-called Messinian 'salinity' or 'desiccation crisis' in the Mediterranean had on marine faunas. The pre-Messinian microfaunas, such as ostracods and planktonic and benthonic foraminifera, were very similar if not identical to Atlantic types. Mass extinction took place during the desiccation catastrophe but repopulation from the Atlantic source commenced in the early Pliocene once normal marine conditions were restored. The effects of the catastrophe on the evolution of individual species could well be intriguing but has still not been fully evaluated.

Most scientists who have considered these extraordinary events in the geologically recent history of the Mediterranean have not sought for a world context, but there appears to be good support for Berggren's suggestion that the Messinian evaporitic phase corresponds with a global fall of sea level. Ecological analysis of foraminifera suggests a 40 m drop, which is in remarkably close agreement with the eustatic fall inferred from oxygen isotope data, due to a phase of growth of the Antarctic ice sheet at this time. It seems as though the structural and topographical situation of the Mediterranean region was such that a comparatively modest drop in sea level was sufficient to isolate it substantially from the world ocean, and well over a million years passed before a further eustatic rise allowed a normal connection to be renewed.

A hundred years ago

THE BRITISH ASSOCIATION

GLASGOW, *Tuesday*

THE Association finds a fitting home in Glasgow, which has few rivals either in earlier or later scientific reputation. The force of long-continued scientific traditions, added to the present encouragement given to science, and I must also say, to the nearness of the finest holiday localities, makes this one of the most brilliant of recent meetings. Not only is the total number of members and associates attending very high, over 2,700, but the true chiefs of science are present in great strength. It cannot be said that the Association itself is this year at all below its high aims. The majority of papers are really scientific, and do not emasculate the truth in the effort to popularise it. Discussions have been very interesting, judging from the perseverance with which they have been listened to. The reception given by the people of Glasgow is worthy of the city, although it is possible that in the details and refinements of arrangement, Bristol excelled. This was especially manifested in regard to some of the excursions. But it is evident that the very best efforts of the north have been put forth in every way, and the general result is undeniably successful. The charming situation of the University Buildings, in which all the sections but one hold their meetings, is a very great advantage.

From *Nature*, **14**, September 14, 425; 1876.