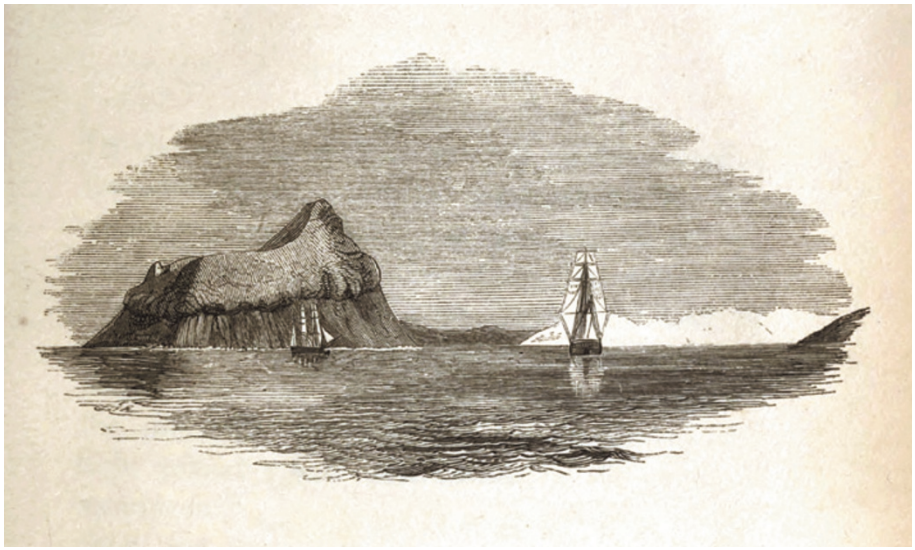

Figure 1 | Voyage of discovery. This image from James Clark Ross's *Voyage of Discovery*[1] shows Admiralty Sound blocked by ice in 1842. Cockburn Island is shown on the left, with vessels *HMS Erebus* and *HMS Terror* in the foreground. The edge of James Ross Island is visible on the right. An ice-core temperature record[2] from the summit of James Ross Island shows that recent warming in this area has been unusually rapid.

ice core as palaeothermometers, the authors show that warming began at James Ross Island in the 1920s, well before the advent of chlorofluorocarbon production and the development of the stratospheric ozone hole. This timing is in good agreement with the only long instrumental temperature record available anywhere near the Antarctic Peninsula — on the sub-Antarctic island of Orcadas, some 1,000 kilometres to the northeast[9]. It is also in agreement with instrumental records for the Southern Hemisphere as a whole, and with the ice-core record from the West Antarctic Ice Sheet[10].

Although temperatures on the Antarctic Peninsula comparable to those of the present have certainly occurred in the past, the last time that century-average temperatures were as warm as those of the twentieth to early twenty-first centuries was about 2,000 years ago — corresponding with evidence from marine sediment cores indicating that this was the last time Prince Gustav Channel was open[11]. Thus, the growth and decay of Antarctic Peninsula ice shelves have followed temperature variations over thousands of years.

Mulvaney and colleagues' results provide evidence that the modern occurrence of exceptionally warm temperatures on the Antarctic Peninsula may not be attributable solely either to the decline of stratospheric ozone — the warming trend begins too early — or to natural decadal climate variability. Indeed, one could postulate, as a null hypothesis, that warming on the Antarctic Peninsula is independent of the global-warming trend of the past century. However, the rate of recent warming at James Ross Island is highly unusual, falling within the uppermost 0.3% of all century-scale temperature trends of the past two millennia, which would compel us to reject the null hypothesis with confidence. A caveat is that this conclusion applies only to mean annual temperatures; obtaining seasonal information from ice cores is difficult. These results cannot, therefore, be considered definitive evidence for exceptional long-term trends in summer temperature.

It does not necessarily follow that current warming trends and associated ice-shelf losses will continue. A pivotal influence on Antarctic Peninsula climate, in addition to the effects of greenhouse-gas forcing and ozone changes, are the atmospheric-circulation anomalies that result from climate changes elsewhere, particularly in the tropical Pacific[5,12]. How such anomalies will evolve in the future is highly uncertain[13]. Nevertheless, the unusual temperature increase over the past century suggests that relatively modest radiative forcing from the global increase in greenhouse gases has had a significant effect on the Antarctic Peninsula. Continued increases in both mean annual and summer temperature on the Antarctic Peninsula are a common feature of projections from climate models, given continued increases in greenhouse gases[14]. Mulvaney and colleagues' observations make such projections difficult to dismiss. ■

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50 Years Ago

'Antibiotic activity of various types of cannabis resin' — The differences in chemical composition shown by various types of cannabis resin may be explained by the stage of development of a phytochemical process by which cannabidiolic acid is gradually converted to cannabidiol, tetrahydrocannabinols and finally to cannabinol … referred to as 'ripening' of the resin … According to the results obtained, antibiotic activity decreases together with the progress of phytochemical conversion of cannabinols, that is, together with the increase of hashish activity. Antibacterial agent (cannabidiolic acid) is by the ripening process obviously converted into hashish-active constituents (tetrahydrocannabinols). The antibiotically active unripe cannabis seems to be more common in regions having unfavourable climate, whereas tropical samples more often correspond to the ripe, hashish-active drug.
A. Radošević, M. Kupinić & Lj. Grlić
From *Nature* 8 September 1962

100 Years Ago

We are glad to see that progress is gradually being made with the synchronisation of clocks … Last year a committee of the British Science Guild … recommended that, as a beginning, it would probably be well to have a few large public clocks in London synchronised, and that these should be set apart and considered as "standard time clocks." An electric clock which may be used for the purpose suggested by the committee has just been built by the Silent Electric Clock Co. … We understand that this electric clock … is also to be controlled by a master clock directly synchronised from Greenwich. The clock thus represents an up-to-date form of public timekeeper which is likely to be extensively adopted in the future.
From *Nature* 5 September 1912