NATURE

50 Years Ago

Hospital Infection: Causes and Prevention. A systematic approach to the causes and prevention of hospital infection is much to be welcomed. Accurate records are meagre and the problem is one which belongs to everybody and, consequently, to no one. Since streptococcal infections now cause no real difficulties—they still respond to penicillin and have acquired no resistance to the drug—the book is mainly concerned with the staphylococcal infections which, because of their resistant strains, are the main source of infection and worry in hospitals today... The text is clear and logically presented, and adds to the value of a book which should be useful not only to pathologists and bacteriologists but also to surgeons, paediatricians, sister tutors, hospital administrators, and equally important, hospital architects.

From *Nature* 8 April 1961

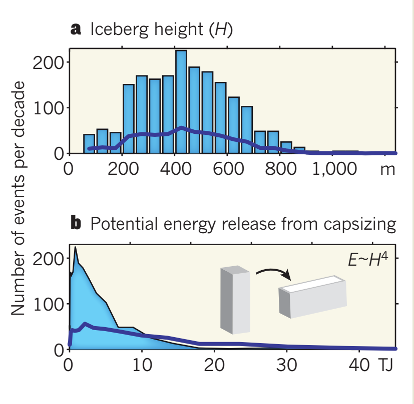
100 Years Ago

Dr. A. C. Johansen gives a summary account of the recent investigations on plaice and plaice fisheries in Danish waters... It includes an account both of the market statistics of plaice landed and of the special scientific investigations and experiments which have been carried out. The market conditions in Denmark are exceptional ... the chief demand is for fish that are landed alive... [As] there is a size limit (25.6 cm.) below which they are not allowed to be landed, and the fish under this size are returned to the sea, the actual destruction of small fish is insignificant. It appears that since the introduction of the size limit the Danish plaice fisheries in the North Sea have increased, and the report speaks in favour of an international size limit for plaice for all countries carrying on fisheries in the North Sea.

From *Nature* 6 April 1911

BOX 1

Iceberg height and capsize energy



These results come from simulations for the Antarctic made at my institute with the Potsdam Parallel Ice Sheet Model[3,4]. **a,** Frequency distribution of iceberg height, *H*, in discharge events per decade, assuming a quadratic ground area proportional to H^2. Iceberg discharge is computed from the vertical extent of the ice sheet and its velocity distribution in the present-day equilibrium state. The results show a peak in the abundance of icebergs with a height of around 400 metres. This differs from observations of icebergs that are freely floating in the ocean[5,6], and is probably due mainly to the assumption that icebergs break off only in whole slices. But it provides an indication of how much discharge occurs at various heights of the ice-sheet margin at which iceberg calving occurs. **b,** Potential energy, *E*, released from capsizing of these icebergs, with $E \sim H^4$. The shading depicts results for an aspect ratio (thickness/height) of ¼. Maximum energy is released for an aspect ratio of ½ (thick blue lines in both **a** and **b**). 1 TJ = 10^{12} J. For comparison, 4.2 TJ is the energy released by the explosion of one kilotonne of TNT. **A.L.**

this energy is available for tsunami generation. The authors suggest at least five other ways in which energy can be dissipated, ranging from the small rocking motion of the capsized icebergs themselves to mesoscale turbulent friction within the ocean. On the basis of a scaling analysis and by analogy with submarine landslides, however, the authors propose that several per cent of this energy can be translated into a tsunami wave. This is the crucial and most complicated part of the problem.

Once the energy transfer is known, the question arises of what height of tsunami is produced by an iceberg capsizing. The authors find that in typical iceberg regions located off the coast, but not yet over the deep ocean, the tsunami crest can reach up to 1% of the initial iceberg height — that is, 4 metres for an average iceberg from Antarctica (Box 1) but possibly up to 10 metres for the tallest icebergs on Earth. These numbers are comparable to the open-ocean crest heights of the devastating tsunami in the Indian Ocean in 2006 and the recent event in Japan. But they need to be understood as simple estimates — as ballpark values that show that capsizing icebergs may cause considerable tsunami waves. MacAyeal and colleagues provide a clean and beautifully simple theoretical framework for further studies of the subject. As stated by the authors, laboratory experiments, field observations and model simulations are essential to better understand the phenomenon.

Tsunamis generated by sudden iceberg motion have been reported to cause severe but localized damage in some Greenland fjords, where harbours have been destroyed by the wave[2]. Whether they pose a threat to more populated areas remote from their point of origin merits investigation. In principle, tsunamis pass across the deep ocean with practically no dissipation because friction there is low, and they are hardly disturbed by ocean currents such as the Antarctic Circumpolar Current or the North Atlantic Current.

We will need a great range of scientific insights — from iceberg-calving physics to wave generation from sudden iceberg motion — before we can say whether such glacial tsunamis will become more abundant in a world experiencing global warming. In principle, it is possible that iceberg-generated tsunamis could travel across the oceans and reach areas more populated than Antarctica. But as MacAyeal and colleagues speculate[1], even in the south polar region, explosive energy release might have wider effects by causing the collapse of floating ice shelves, thereby influencing global sea-level rise. ■

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