

programmes are still essential parts of their military research and development. So long as most nations are prevented by the non-proliferation treaty from acquiring materials with which to make weapons, while Britain seems to have lost interest in nuclear testing and while only France and Mainland China conduct modest programmes, it seems quite safe for the two super-powers to push vigorously ahead with the development of anti-ballistic missiles, multiple warheads and even the improvement of existing military nuclear explosives. The snag, as both of them are now beginning to discover, is that it is virtually impossible to reconcile such programmes with the need which both powers recognize to create means of restraining their mutual destructive capacity as in the SALT negotiations. And, of course, it is becoming plain that an efficient test ban treaty could go a long way to do what is likely to emerge from any agreement in Vienna. At the very least, it would tie both nations' hands behind their backs. In circumstances like these, of course, there is theoretically a danger that one side or the other might be able to steal an advantage, either by a premeditated abrogation of the treaty or by sheer cleverness and stealth, but these are exceedingly improbable calculations. What seems to be happening now is that the super-powers are beginning to see the errors of their previous ways.

It goes without saying that the benefits of a comprehensive test ban treaty would outweigh those of even the considerable measures of arms control which have been

implemented in the past few years or which seem just over the threshold—the non-proliferation treaty itself, the agreements on nuclear weapons in the Antarctic and in outer space, the discussions on the demilitarization of the sea bed and the various ways which have been proposed for strengthening the Geneva Protocol on chemical and biological weapons. In particular, a comprehensive test ban would help to get rid of the asymmetry built into the non-proliferation treaty, which gives the major powers pride of place. (Nations which have bombs already can continue to develop them, but nations without bombs must stay that way.) It would also be an improvement on the partial test ban, which forbids the testing of nuclear weapons in the atmosphere, especially as it is now becoming unclear what significance should be attached to underground explosions which vent radioactivity to the atmosphere. But then, to the extent that a comprehensive test ban treaty would limit the capacity of the super-powers to develop new kinds of warheads, it would subsume agreements such as that on the demilitarization of the sea bed. But finally, there is the more mundane but equally telling consideration that a test ban treaty, by removing the need to verify that the non-proliferation treaty is being honoured by its signatories, would allow the International Atomic Energy Agency to abandon a programme of inspection (among the nuclear have-nots) that threatens to become as much of an international hazard in its own right as any violation of the treaty.

Weather Watching

WITH all the fuss there has been in recent months about the possibility that carbon dioxide in the atmosphere may affect the climate on the surface of the Earth, it is something of a surprise that so little attention is being paid to the long-term climatology which must, most people would suppose, form the basis for objective assessment of the effects of recent changes in the constituents of the atmosphere. Even in the United States, where the concern about what is called the greenhouse effect appears to be strongest, the research programmes being undertaken by various federal agencies are more concerned with such things as the detailed measurement of dust particles in the stratosphere or the construction of mathematical models to predict the consequences of changes which may be brought about. By comparison, comparatively little effort has been devoted to the long-term historical studies which could, in principle at least, help to throw light on problems of immediate concern. After all, the fluctuations which there have been in climate in the past two centuries, many of them now well documented, are often greater than those expected to be caused as a result of atmospheric contamination of the most serious kind. Going further back, the fluctuations in the centuries immediately following the melting of the ice 8,000–10,000 years ago were—perhaps understandably—even more dramatic. In all these circumstances, it is a great surprise that simple climatology is so neglected. After all, in the nature of things, the benefit of more research of a quite orthodox kind could easily be not merely some measure of understanding of recent fluctuations of climate but also an answer to the question whether the Earth's climate is

now comparatively stable or whether the present period is merely an interstadial, an interval of recession between two ice ages. Whatever the Jeremiahs may say about the dangers of climatic change brought about by carbon dioxide, there is no question that the return of the ice would be a greater calamity. To be sure, while offering few immediate short term advantages, prior warning of such an impending disaster might prove of no small practical value. And that is a powerful case for more climatology.

100 Years Ago



NOTES

A PROPOSAL has been made that certain Medical Schools on the north and south sides of the river should be amalgamated, in order that, by concentration of power, the teaching shall be made more efficient than it is at present, the teachers being able to devote themselves more unreservedly to their duties than they possibly can do under existing arrangements. The absolute necessity of some such arrangement as this is obvious.

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