

ciate is that basic research is indeed a powerful source of innovation even if it is sometimes hard to quantify the economic benefits. Even recondite speculations such as the mechanism of pulsating stars (see page 161) are of considerable value to society; if the outcome is a better understanding of the difference between pulsating stars and other kinds of stars, people of all kinds, not merely astrophysicists, will find the Universe a more comfortable place in which to live. But it would be a rash man who would say that a better understanding of how stars function may not in the long run be of economic benefit. The practical problem, therefore, is the present lack of criteria, agreed between governments and the scientific community, about the scale on which basic research should be carried out. Before anything much is said, there is a need for a careful investigation of the place of basic science in modern life and then for a moderate but forceful statement of the need.

Other institutions within the scientific community can do a lot to help. Within the university system, but especially in Britain, it is important that scientists should recognize the need for selectivity and concentration. No great harm would come about if it were openly acknowledged that only some university departments in particular fields of science were important centres for research (which does not of course imply that academics in other departments need or should opt out of scholarship). In Britain, this is especially important now that the polytechnics are bent on following universities along the path of uniformly distributed research funds. The grant-giving committees of the National Science Foundation and the National Institutes of Health in the United States, and of the research councils in Britain, have a similarly important part to play in implementing such a policy. And for as long as the budgetary pressure on research funds remains as powerful as it is, the temptation to secure a lien on government funds by the setting up of research institutes separate from universities should be resisted. Especially because policies like these will require that individual researchers should frequently be prepared to forgo personal advantage for the common good, it is of the utmost importance that the steps to be taken to meet the pressures on research should be publicly discussed and widely agreed.

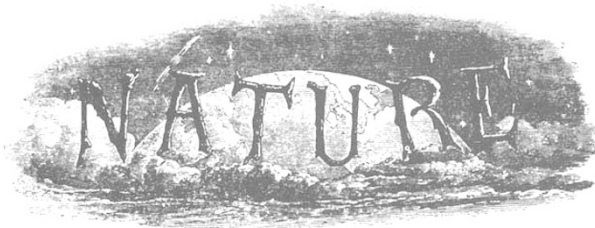
## Dr Medvedev in London

THE Soviet government has done well to allow Dr Zhores Medvedev to spend the coming year at the National Institute for Medical Research at Mill Hill, London. For several years Dr Medvedev has been campaigning for more liberal arrangements for Soviet scientists to communicate with colleagues elsewhere, and has suffered much inconvenience as a result. Perhaps the Soviet government has wryly calculated that it will be best for both of them if Dr Medvedev now spends a year rusticated in Britain and there is always of course the chance that he may find the traffic is not an unmitigated blessing, that even Western scientists are sometimes over-reticent and that the common concern about research budgets can depress the spirit. Yet the Soviet government should know that giving a passport and an exit visa to Dr Medvedev and his family will go a long way to ease

relations with the scientific community in the West. For Dr Medvedev has been something of a test case, and in the past few months there has been much muttering about the wisdom of participating in international conferences organized in the Soviet Union. This should now be in large measure dissipated (which is not to say that Western scientists would not welcome much less formal means of spending time with individual Russian scientists and of communicating with them). And it goes without saying, of course, that if the Soviet government's liberal action in the past few days should be followed by a revocation of his exit visa, unthinkable though that may be at present, there will be a howl of protest and lasting damage to cultural relations with the Soviet Union will be done.

By his own account, Dr Medvedev is a Russian patriot and is determined to return to the Soviet Union when his year is up. It is therefore important that he should be helped as much as possible to devote himself single-mindedly to his research, and that he should not be drawn into situations which could be interpreted as disloyal to the Soviet Union. For, however much people in the West may think it their right to go abroad and criticize their governments, it is well known that the Soviet government takes a different view.

## 100 Years Ago



### THE NAVY AND SCIENCE

IT would be difficult to estimate the many excellent effects that are likely to result from the establishment of the Royal Naval College, which, as has been at last authoritatively intimated, is to be opened on February 1, in those noble halls at Greenwich that for so long have been associated in another way with the British Navy. Her Majesty's Government deserve the highest praise for the wisdom—provokingly tardy though it has been—displayed in the thorough and handsome provision they have made for the scientific education of our naval officers. Much that is sarcastic, no doubt, might be said on this tardiness of a Government which seldom moves until it is driven; but as we fear this would do little good, we shall only express a hope that in future when they are compelled to take action in any matter, especially if it be scientific, they will do so as decidedly and sweetly as they have done in the present instance.

#### Movements of the Earth's Surface

It is, I believe, commonly supposed by geologists that the movements of the surface of the earth are caused by the refrigeration and contraction of the interior. But since the glacial epoch the surface of the earth has become warmer; consequently since that time a heat wave must have been passing from the surface towards the centre; and consequently since that time no refrigeration nor contraction of the interior can have taken place. If, therefore, movements of the earth's surface were due to this cause only, no such movements should have taken place since the glacial epoch.

F. W. HUTTON  
Wellington, New Zealand, Nov. 10, 1872

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