International collaboration

SIR — The letter fron J. Sylvan Katz and Diana Hicks (*Nature* **375**, 99; 1995) underlines some of the reasons why the Burroughs Wellcome Fund, a non-profit foundation in North Carolina, United States, provides approximately $1.3 million each year to support international and domestic collaborations among scientists.

In response to the need for scientists to exchange views with and obtain research techniques from colleagues in other countries, the Wellcome Trust in England and the Burroughs Wellcome Fund created in 1979 an exchange programme called Wellcome Research Travel Grants. Intended to advance medical science by speeding the transfer of knowledge and skills, the grants provide US and UK researchers in the health sciences with travel and subsistence support for periods ranging from 2 weeks to 6 months. More than $100,000 in grants was awarded in 1994.

Other fund award programmes to support international and domestic collaborations include the Hitchings-Elion Fellowships, which provide US scientists early in their careers with training in the United Kingdom, and visiting professorships. They also enable researchers from the United States and elsewhere to spend time at US medical schools, universities and other non-profit research institutes. The Hitchings-Elion Fellowships enable postdoctoral fellows to work in a UK laboratory for 2 years and return to the United States for the third year of the award. More than $900,000 was awarded in 1994 for these scientists.

The Wellcome Trust, our sister foundation and the world's largest medical charity, also provides substantial support for a variety of other programmes that foster international collaborations.

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Popov and Marconi

SIR — In this centenary year of wireless, Oerst G. Vendik is justified in commemorating Popov as a pioneering physicist and electrical engineer[1]. Nevertheless, his portrayal of Popov's achievements, distorted by their dissociation from historical context, perpetuates the controversy engendered by the Soviet authorities in 1945 about who invented radio. The question of Popov's contribution to radio was comprehensively and objectively examined by Susskind[2] in 1962. The conclusions were: (1) According to the criteria of priority of publication, Marconi invented radio communication by making a successful application for the world's first patent for wireless in June 1896. (2) On the basis of historical research there is indirect evidence that Popov transmitted intelligent signals before that, in March 1896, but there is comparable evidence that Marconi did likewise at an even earlier date[3].

Both Popov and Marconi, without knowledge of the other, developed radio receivers based upon the coherer design and decoherer invention of the Englishman Oliver Lodge[4]. Popov's first receiver (demonstrated in May 1895) was flawed. In Popov's words, its use for the transmission of signals over a distance might be achieved "as soon as a source of such oscillations with sufficient energy will be discovered"[4,5]. Sufficient energy was found in powerful discharges of lightning and Popov's receiver was successfully used as a storm detector.

Meanwhile, Marconi had appreciated what Popov had failed to recognize — that intelligent communication required a sensitive receiver and not a powerful transmitter. Marconi had improved Lodge's coherer so much that during 1895 he transmitted Morse signals over a distance of 3 km and by February 1896 he was sufficiently confident with his invention that he left Italy for London to exploit a patent application[6].

Marconi, in his own words, was "an ardent amateur of electricity" with an independence that allowed him to pursue his ideas. Popov was an eminent academic scientist, possibly constrained by being employed by the Russian Navy. As Susskind pointed out in 1962, the Russians have good reason to be proud of a pioneer of Popov's calibre, but to enlarge his reputation out of proportion to his achievements amounts to a deviation from objectivity that must be deplored[2].

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Polio vaccines

SIR — The eradication of poliomyelitis by early next century (*Nature* **374**, 663; 1995) seems likely, but the end of the road is unlikely to be smooth and straightforward. This is obvious from a recent episode.

Two days before the start of a special drive against poliomyelitis in India, 42 children were inoculated with polio vaccine at Nadia primary health centre (PHC) in West Bengal: within 24 hours, eight had died and 34 were seriously ill. This incident will have deterred hundreds of parents from vaccinating their children, thus wrecking their lives. Any immunization programme for successful eradication requires coverage of the target population. More than 75 per cent of new polio cases reported annually are from India, Pakistan, Bangladesh, Burma and Nepal. Because of poverty, a low rate of literacy and insanitary conditions, the wild virus thrives in this part of the world and poses a threat to regions free from polio. There were national polio immunization days all over the subcontinent in April. Middle East and Central Asian countries planned to immunize 70 million children, according to the World Health Organisation.

Many of the Indian daily newspapers on 5 April 1995 made the deaths at Nadia PHC their lead story. In fact what the PHC had used was not a vaccine at all. Even outdated polio vaccine is not lethal. Corruption in public health departments in some countries is another limiting factor in prompt and effective implementation of any massive programme. Large-scale theft and black market resale in Burma, and perhaps elsewhere in South-East Asia, of expired and potentially toxic vaccines for tetanus and diphtheria (see *Nature* **374**, 669; 1995) is a glaring abuse. Criminal misuse and adverse publicity can cause parents to shun vaccination and jeopardize both the health of their children and the immunization programmes.

It is in everybody's interest that poliomyelitis should be eradicated as fast as possible. The money saved could be diverted to immunological studies. A better understanding of the immune system, which has evolved to combat pathogens, may help to deploy the future peptide vaccines efficiently against malaria and other eukaryotic parasitic diseases that have eluded control through vaccination by defined antigens. This type of investment, along with the European Commission plans for vaccine development (*Nature* **374**, 663; 1995), should encourage pharmaceutical industries to manufacture newer and better vaccines that are expected to be developed more rapidly with advances in molecular biology.

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