

two should work separately from non-military communication did not seem to interest anyone involved. Military codes are still the only guarantee of secrecy and when future satellites, not many years from now, have 48,000 circuits or more, it will be hard to believe that the military have that much to say to one another to justify the sole occupation of a valuable parking space in equatorial orbit.

CERN ACCELERATOR

No Room for the Ring?

THERE is a danger that the discord over the siting of the proposed 300 GeV CERN accelerator may cast a shadow over the role of West Germany in European scientific collaboration. In German eyes, the issue revolves around the glaring imbalance between the economic and political influence of West Germany, whereby the Federal Republic shoulders the largest financial burden in European scientific ventures and yet has no important European project on its soil.

A meeting is being held in Geneva on January 28 and 29 between ministers of the six countries backing the accelerator. France will be represented by M. Robert Schumann, the Foreign Minister, and West Germany by either Dr Leussink, the Science Minister, or Dr Walter Scheel, the Foreign Minister. The need for such a meeting became clear when the CERN Council felt unable to reach a decision on the siting of the accelerator at its December meeting. On December 11, the West German Government made it clear that the Federal Government would have to reconsider its allegiance to the project if the German site at Drensteinfurt near Munster was not selected.

The CERN Council has always maintained that the location of the accelerator must be decided on scientific grounds alone. The West German view, however, is that any of the five sites put forward by the participating countries is suitable. (Switzerland is excluded from the auction.) It is pointed out that none of the important European scientific centres is in West Germany—the IAEA is in Vienna, Euratom in Brussels, ESRO in Paris, CERN in Geneva, the FAO in Rome and Dragon in England. Another point that is likely to be discussed in Geneva is the absence of German as an official language at CERN; at present, only English and French are official languages.

Superficially, the West German Government has a fair case, and the CERN Council might well have selected the Drensteinfurt site in any case. But the whole concept of scientific cooperation is placed in jeopardy once a major partner starts trying to impose political decisions on a joint scientific project, and the French Government clearly regards the issue as one of many crises of confidence within the European community. Many other joint projects are in the pipeline—the giant computer project involving Siemens, ICL, CII, Philips and Olivetti, and the Franco-German plan for a joint telecommunication satellite among them—and both the French and German Governments are keen that the impasse over the accelerator should not impair the climate of scientific and technological cooperation. Another collaboration recently announced between France and West Germany is for the construction of a trainer aircraft to replace the twin jet Fouga Magister. This could pave the way for closer ties between the air forces of the two countries.

CHANNEL TUNNEL

Is there a Light at the End?

THE outcome of the competition among three international groups of companies with plans for financing the Channel Tunnel project will probably be a merger. According to a spokesman for the Channel Tunnel Company Ltd—a member of one of the groups—talks have been going on for some time and are now in their final stages. The British and French Ministers of Transport were expected to choose one of the three proposals by the end of last year, but it now seems that their decision is likely to be whether to accept a combined plan.

The initiative for joining forces came apparently from Mr Richard Marsh when he was Minister of Transport. As early as October 1968, he said in reply to a parliamentary question that the three groups were being asked to revise their original proposals and added that they were invited, "should any of them prefer to do so, to combine for the presentation of fresh proposals". Since then, competition has gradually changed into cooperation. Although the talks have not yet reached a conclusion, there is said to be little likelihood that they will break down.

Still more planning will be necessary if the British and French Governments accept the group's proposals. The first stage will be for the group to make another study of the economics of a Channel Tunnel—including revised estimates of the traffic it would carry—to "bring the thing up to date", as Mr Fred Mulley, Minister of Transport, said in Parliament on November 11, 1969. This will take two years. Only then will the final decision be made about whether to go ahead with building the tunnel. There is thus still time in theory to consider alternatives such as a bridge, some kind of combination of bridge and tunnel or even a dam.

Plans for building the rail terminals, however, are already well advanced, with Cheriton in Kent chosen as the British site. The exact land requirements are not yet known, and there will be no compulsory purchase of land until the final decision on whether to bore, but in the meantime the Ministry of Transport is keeping in touch with the local authorities.

TOBACCO

Smoking over Peak

THE latest collection of statistics put out by the Tobacco Research Council (*Statistics of Smoking in the United Kingdom*, Research Paper 1, fifth edition) show that tobacco consumption in Britain is now slightly below the peak of the early sixties. The consumption of tobacco among men is now in fact lower than at any time since the early twenties. According to an analysis of a survey carried out by the Tobacco Research Council, consumption per adult male in 1968 was 8.8 lbs per year, representing a steady decline since the annual consumption of 10.6 lbs per head in 1960. The peak of tobacco consumption in Britain seems to have been in 1945 when consumption worked out at 12.5 lbs per head per year. The end of the Second World War probably explains the decline in tobacco usage, which amounted to only 9.3 lbs per head per year in 1950. If men are smoking less, however, there seems no consistency in

the pattern of smoking in Britain—since the mid-fifties, consumption has been within 10 per cent of 3.3 lbs per head.

The change in smoking habits seems more remarkable than the slow decline in the total amount of tobacco used in Britain. Among the public as a whole, the total consumption of cigarettes has been declining since the early sixties and is now 20 per cent less than the peak of 243 million lbs reached in 1961. Among men, the consumption of cigarettes has fallen from 8.7 lbs per head in 1960 to 7.1 lbs per head in 1968. There has, however, been a persistent tendency to smoke smaller cigarettes, and sales of cigarettes in Britain have actually increased in the past decade to 121,000 million, more than two-thirds of them tipped. Cigars have caught on even faster and consumption has multiplied fourfold in the decade.

Although the flight from tobacco has made its mark on the total consumption, the tendency for young people to start smoking early apparently continues. Among fourteen year olds, for example, average weekly consumption among boys has risen from 1.9 cigarettes to 2.4 in the past two years. The research paper shows quite clearly that among fifteen year olds, girls as well as boys, the incidence of the smoking habit is between four and five times as great among those who have started work than among those who remain at school. In short, although public opinion has begun to respond to propaganda about smoking and its medical consequences, there is obviously a long way to go before a radical change of habit is brought about.

ANTIBIOTICS

Swann under Attack

VETERINARIANS gathered at the Royal Society of Medicine in London on January 19 expressed some strong criticism of the recent British Government report which proposes the restriction of certain antibiotics to therapeutic uses (see *Nature*, 224, 835; 1969). They are annoyed that Professor Michael Swann and his colleagues on the committee wish to prevent the use of certain antibiotics, including tetracyclines and penicillin, in animal feeds, because of the danger of the spread of resistant strains of bacteria from animals to man.

Professor T. H. Jukes (University of California) said that he knew of no evidence of any public health problem. For nearly eighteen years, he said, antibiotics have remained effective as promoters of animal growth, and to restrict tetracyclines and penicillin to a veterinary surgeon's prescription, so that they are only used for therapeutic purposes, would be unduly severe. Jukes was supported in this contention by Dr R. Braude (University of Reading), an expert in the husbandry of pigs, who called for more reliable information to challenge the value of antibiotics in feeds before any of them are banned by legislation.

The critics agreed with Swann that transfer of resistance between intestinal bacteria has been demonstrated *in vitro*, but disagreed that there is adequate evidence for any but very low transfer in the human alimentary tract. Jukes also pointed to recent findings that transfer of resistance from *E. coli* to *Salmonella* is a hundred times more frequent in rough non-virulent strains of the recipients than in smooth pathogenic strains. This they claimed as an indication of a sort of

genetic drift towards a predominance of rough non-virulent strains as more bacteria become resistant.

This idea, however, was dismissed as irrelevant by the only vociferous supporter of Swann present, Dr E. S. Anderson (Enteric Reference Laboratory, Colindale). He said that it is not the rough but the smooth virulent strains that we must worry about, and there are enough of these to make resistance a threat to health. Anderson also denied that there is any lack of evidence of the dangers of bacterial resistance and the spread of zoonoses to man. Ample evidence, he said, lies in the high proportion of strains of *Salmonella typhimurium* in human infections which belong to known bovine types.

The fears of agriculturalists who see themselves being deprived of a useful means of boosting productivity and controlling disease were clearly summarized by Dr R. H. White-Stevens (Rutgers University), who spoke on the topical subject of man in his environment. After a few words about expanding human populations, he went on to discuss the need to increase production of meat protein. This will necessitate large herds and flocks, in which risks of disease will increase, and for which therapeutic treatment will be impossible. The Swann Report, he said, gave the impression that diseases should be allowed to penetrate herds and flocks before any measures are taken against them. This he did not approve, and he expressed the hope that the British Government in implementing the recommendations would not make any blunders, by banning on insufficient evidence, such as the recent decisions on cyclamates.

HISTORY OF SCIENCE

Work in Progress

Thomas Cheek Hewes, Robert Angus Smith and Johann Tobias Mayer are going to be somewhat better known in the near future. At the moment they can be found in the minds of some of the postgraduate students listed in a catalogue of work in progress just issued by the British Society for the History of Science. Compiled by Dr W. H. Brock, a lecturer at the University of Leicester, the catalogue is the first full-scale attempt to detail all the theses in the history of science currently being written in British universities. It can be obtained, free, from the society's assistant secretary at 393 Cowley Road, Oxford.

The list is surprisingly readable, for there seems to be a tradition that scientific historians should furnish their labours with evocative titles. Some are predictably solid and respectable (*The Role of Granite in Early Nineteenth-Century Geological Theory*); others hint at more esoteric realms of experience (*History of the Uses of Gutta Serena*). Now that the numbers of people studying the history of science are growing, the research topics are becoming correspondingly more specialized. At University College, London, for example, chosen fields include English dietary advice in the sixteenth century, the astronomers of Pulkovo from 1839 to 1918, and a comparison of how the librarian and medical professions have evolved. Darwinism and religion—everybody's favourite undergraduate essay subject—now has just one student, and even she is using Victorian periodicals as source material.

Dr Brock says that his catalogue is as complete as possible, and the absence of a few theses is caused only