

High-energy physics

Future accelerator plan

Chicago, Illinois

AN enormously powerful colliding particle accelerator, the Superconducting Super Collider (SSC or the "desertron"), may still be only a gleam in the eye of US physicists but last week a workshop on the options for the proposed machine brought its construction a little nearer. SSC, at 20 TeV per beam, would be 20 times more powerful than even the Fermilab collider, which is still under construction.

The workshop, held at the University of Chicago and co-sponsored by Argonne National Laboratory, brought together about a hundred high-energy experimenters and theorists to sharpen the arguments on the relative merits of proton-proton colliders and antiproton-proton colliders. Either could still be the basis of SSC, which was recommended last year by the US high-energy physics community as the next big step in US accelerators.

Antiproton-proton colliders — such as the one at the European Organization for Nuclear Research (CERN) at Geneva and that being built at Fermilab — can circulate both types of particles within the same beam pipe and thus need only one ring of magnets. At 90 km in circumference, a one-ring SSC could cost considerably less than a two-ring proton-proton machine. However, antiprotons cannot be produced as copiously as protons. Antiproton colliders thus have lower luminosities and produce fewer particle interactions.

But the disadvantages of an antiproton collider may not be so great as had been thought. For example, the antiproton source group, headed by James Simpson of Argonne and Thomas Collins of Fermilab, concluded that antiproton sources can be built that would provide luminosities greater than 10^{32} per cm^2 per second. This approaches the 10^{33} that has generally been assumed possible in a proton-proton machine and necessary for much of the expected physics. In addition, most of the groups reported that luminosities much above 10^{32} would usually be unnecessary.

A proton collider can always be made more luminous than an antiproton machine, Collins told his audience. "But let's not choose a machine based on capabilities that we don't really need." However, the groups studying tests of electroweak interactions and potential new particles and interactions decided they could sometimes use all the luminosity they could get. Others, according to Robert Cahn of the Lawrence Berkeley Laboratory, really would like both types of collisions. But when the next major workshop on SSC takes place in June at a three-week meeting in Snowmass, Colorado, the participants will have two strong candidate accelerators to consider. **Larry Arbelter**

UK pollution control

Commitment urged

THE Royal Commission on Environmental Pollution, in its 10th report, published this week, urges the British Government to "play a more positive role" in promoting environmental issues in the European Community. In a survey of its 14 years of offering advice on matters of pollution, the commission concludes that British commitment to international action "has not always been as strong as it might be". And on the vexed question of acid precipitation, concern over which is currently spurring several EEC draft directives on air pollution, the commission says that the Central Electricity Generating Board (CEGB) should within the next five years introduce pilot plants to investigate the various options for reducing emissions of sulphur dioxide from its power stations.

The EEC draft directives on air pollution controls, which are being pushed hard by West Germany, are currently the subject of an inquiry by a House of Lords Select Committee. This week the committee will hear a CEGB claim that one of the major proposed directives (on large combustion plants) misquotes figures from a cost-benefit analysis of sulphur emission reductions. The Confederation of British Industry and the Chemical Industries Association will join CEGB in condemning the draft directive as "excessive" and "very damaging". It calls for, among other things, a 60 per cent reduction in total national emissions of sulphur dioxide and fixed emission limits for sulphur dioxide from large plant. A separate draft directive on air quality limits for nitrogen oxides is also attacked for being too stringent.

The Royal Commission on Environmental Pollution has very widely drawn terms of reference and has never been afraid to use them. The commission, whose present chairman is Professor Sir Richard Southwood, Linacre Professor of Zoology at the University of Oxford, delivers a well-aimed swipe at Whitehall officials who have allowed ministers "unfettered discretion" over timetables to frustrate the wishes of Parliament. Implementation of the 1974 Control of Pollution Act has been piecemeal and incomplete, according to the commission, and "reflects little credit on successive administrations". Such action as has been taken is ascribed to pressure from the EEC. The lack so far of any government response to several of the commission's earlier reports is described as disappointing.

Official secrecy over pollution control has long been a controversial issue in Britain, and the latest report from the commission reaffirms its position firmly on the side of the "right to know" camp. No less than ten detailed recommendations urge greater public access to information compiled by pollution enforcement authorities. The commission says that "a guiding principle

for all legislative and environmental controls . . . should be a presumption in favour of unrestricted access" with provision for secrecy only in exceptional cases. Observing that secrecy fuels fear, the commission draws attention to public anxiety over nuclear power and calls for greater public representation on bodies concerned with managing nuclear waste.

Recognizing that there is a growing awareness of the urgency of international pollution problems, the Royal Commission advocates more forward planning of measures designed to avoid pollution before it becomes a problem. Thus it recommends government support for research into new potential pollutants from high-technology electronic and biotechnology processes, as well as more "traditional" pollutants in air and water. The government should also study how pollution control equipment is subsidized in other countries with a view to introducing subsidies in Britain. The commission says the politician faced with decisions on pollution control "cannot wait for rigorous proof": prudent abatement practices must be instituted when perceived risk of damage justifies the cost of alleviation. It therefore proposes that decision makers should be guided by principles of the best practicable environmental option and the best practicable environmental timetable. The commission ends by lamenting the decreasing emphasis on environmental protection in Britain and the concomitant decrease in resources. **Tim Beardsley**

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... Astrology Unit. Was this just a typographical error or some mysterious intervention that defies scientific explanation?

I suspect it is now too late to stem the flood of applications from would-be experts in the occult, but may I use your columns to point out to them that, had they been in possession of such skills, they would have known that their applications would be rejected: they should therefore not be surprised if they hear nothing further from us.

Yours etc,
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