THE UNACCEPTABLE FACE OF C.E.R.N.

CERN, the European Centre of Nuclean Research, has a reputation that other laboratories can only envy. And it is acclaimed for much more than scientific excellence alone. It is, we are told, a paragon of efficiency, consistently accomplishing its projects on time and within budget; it is a "European MIT", offering advanced courses in science and engineering to some 140 undergraduates each year; and it is a model of courtesy to the taxpayers who fund it, gladly opening its experimental control rooms to visits by parties of inquisitive French pensioners. Above all, it is wholly consecrated to the purest pure science conceivable—in the words of a 1982 publication, "it is not concerned with atomic weapons, nor with nuclear power stations". Such is the image that the Centre has assiduously cultivated. But does the reality of CERN match the myth?

Supporters of CERN are fond of comparing its work to the 19th century's researches into electromagnetism. Like the investigations of Michael Faraday and James Clerk Maxwell, they suggest, CERN's activities may not yield tangible benefits in the short term, but eventually they will lead to a myriad technological developments as marvellous and diverse as they are inherently impossible to foresee. Yet the analogy is misleading. The reason that an improved understanding of electromagnetism brought so many everyday benefits is that electromagnetism is the force that dominates nature at the level of everyday life. Faraday's experiments were, after all, performed with human-scale technology, so it was all but inevitable that human-scale technology should have profited from what he learned. But there is nothing human-scale about experiments performed at CERN. Particle physicists' studies of the nuclear processes of the microcosm, like astronomers' studies of the gravitational processes of the macrocosm, are essentially concerned with problems that are progressively further and further removed from the plane of daily existence, and therefore—again like astronomical researches—require apparatus that is ever more costly and colossal. It is overwhelmingly improbable that such work can ever bring practical benefits that are not equally megatechnological. Moreover, history makes it painfully clear what form such "benefits" must generally take. Not without good reason did H.B.G. Casimir, then President of the European Physical Society, warn in 1972 of the dangers that would arise if particle physics ever found a technological role.

In fact Casimir's words were already 30 years out of date when he wrote them. As early as the Second World War, it had become apparent that the particle accelerator was of the utmost military significance: from 1941 until the fall of 1943 accelerators were the sole source of plutonium, and it was research with an accelerator—the 184-inch cyclotron at Berkeley—which permitted the perfecting of the "calutron" isotope separation technique that supplied uranium-235 for the Hiroshima atomic bomb. And today the accelerator is regaining its old importance as a tool of fissile-material engineering. The superconducting magnets developed for it are also well adapted to the laser-electromagnetic enrichment of fissile isotopes, or to the magnetic-confinement fusion reactor; and in the form of the accelerator-breeder, it offers an inceasingly attractive route to the manufacture of plutonium. Already CERN has collaborated with West German scientists in experiments ultimately geared towards the construction of such new generation plutonium-breeders. This is merely one of several ways in which CERN is fostering nuclear proliferation.

No less disturbing are CERN's contributions to the post-nuclear technologies of the fast-dawning era of "Star Wars". Some will probably not bear fruit until the next century: CERN's invention of antiproton cooling, for example—the work which won Carlo Rubbia and Simon van der Meer the 1984 Nobel Physics Prize—has not "domesticated" antimatter sufficiently to allow the building of the long-awaited antimatter-triggered thermonuclear bomb without substantial further technical progress. But other research carried out at CERN will find military uses much sooner. Various types of beam weaponry, neutral hydrogen beams and free-electron lasers for instance, heavily rely upon precisely the accelerator technology which is actually CERN's principal sphere of activity. Most of the help CERN has given to beam weapon researchers has so far been only very oblique; but documents published by Los Alamos reveal some exceptions to the general rule. For instance the ray-tracing computer programme TURTLE, devised with CERN's assistance, has been used at Los Alamos in studies of the feasibility of focusing particle beams on very distant targets with arrays of magnetic lenses, while scientists at Los Alamos have been given pre-publication access to data concerning CERN's new proton linear accelerator—in effect a prototype of the kind of high beam-intensity linac that would be at the heart of an orbiting missile-killer. Givern that CERN and Los Alamos are obviously on such cordial terms with each other, it comes as no surprise to find them collaborating in the building of a radio-frequency quadrupole particle injector of essentially the same type as would load such a missile-killer's "ammunition".

To be fair, it must be emphasised that there is little clear awareness within CERN that its work has any military importance whatsoever. Equally, though, it cannot be denied that CERN's blindness is occasionally reminiscent of Admiral Nelson's. Clinging to an extreme—and arguably excessive—belief in particle physics's intellectual worth, CERN is unwilling to entertain any consideration that might in any way come to inhibit it; and this tends to make it overlook both the social implications of its researches and

their social context. Its disregard of the military significance of its activities is, unfortunately, only one manifestation of a strangely child-like single-minded ruthlessness. Another is its building of the new Large Electron Positron Collider without more than token, not to say cynical, consultation of the views of people in its host region; yet another is its abuse of its unique, quasi-diplomatic legal status to allow the contract workers on its sites to be paid less than France's statutory minimum wage. CERN's renowned efficiency of operation takes on a decidedly ironical aspect when, listening to the complaints of a local resident, one hears its behaviour being bitterly likened to that of a multinational on the Ivory Coast.

The angry frustration implicit in that simile is a feeling that many of CERN's critics must share. If objections to CERN's work are answered at all, it is often merely with a sullen resentment that they should ever have been framed in the first place. Nor can disquiet about CERN always be articulated through the normal channels of democracy: in securing executive approval for the LEP, for example, CERN largely succeeded in avoiding the project's submission to what Jean-Marie Dufour, its legal adviser, described as the "long and hazardous" process of parliamentary debate. And this is typical of the manner in which CERN is administrated. In effect the Centre is run not by its member nations' representative assemblies but by their ministers for science and foreign affairs, who, in practice, delegate their authority to committees of assorted "experts". The "experts" are generally so prejudiced in CERN's favour as to grant it more or less whatever it wants; and the ministers are generally so scientifically illiterate—or simply so busy with other matters—that they are seldom able to do much more than rubber-stamp their appointees' recommendations. CERN could not better illustrate the meaning of technocracy if it had been created for no other purpose.

The time is now surely long overdue for CERN to be brought under proper democratic supervision and control. A good beginning might be the convening of an international parliamentary committee of enquiry to seek answers to the questions raised in this article. Is CERN truly acting in the best interests of the people of Europe? Is it not riding roughshod over the rights of its workers and of its host community? In promoting both nuclear and post-nuclear strategic technology, is it not fuelling an ever-accelerating arms race towards a third (and final) World War? That CERN might be reluctant to face such questions is merely a reason for asking them all the more insistently. If CERN is indeed a "European MIT", it is helping to shape the minds of the coming generation of physicists; and we cannot allow these young people to be educated in an atmosphere of introverted social indifference, still less one of an amoral readiness to sacrifice all other human values to the gratification of academic curiosity. We can no longer afford to breed the kind of scientist who, in withdrawing ever further from the world of humble human reality, threatens to become the inadvertent instrument of that world's absolute destruction.

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