

THE LAST WORD

A LITTLE KNOWLEDGE IS DANGEROUS

by John Collins

A little knowledge is a dangerous thing," so the saying goes. To overcome this danger, the scientifically minded would propose searching for further knowledge through research. For others, however, the possibility of danger mitigates against the acquisition of even a little knowledge. This is certainly the case in Germany: an aversion to scientific investigation in general, and to gene technology in particular, is severely shackling German biotechnology.

As reported in *Bio/Technology* (7:1213, Dec. '89), approval for the Hoechst insulin production plant originally given by the local government of Hessen has been blocked by a second, local court, a decision that can be repealed only at the level of the Federal Constitutional Court. Also awaiting approval are applications from BASF for tumor necrosis factor (TNF) production (initiated August '88, facing 1,800 objections) and from Behring for erythropoietin (EPO; April '87). In the meantime Bayer, BASF, and Hoechst have planned production and research facilities abroad. The German pharmaceutical industry has essentially stopped hiring new researchers, although this follows a year of unprecedented profits. A national law (first reading November 15, 1989; 250 proposals for alterations from local governments) defining the modality and requirements for approval for production facilities is being formulated to control use of recombinant organisms in accordance with the European Directive on contained use.

The arteries of academic research, too, are becoming constricted by the tourniquet of public pressure. Grant proposals involving large-scale sequencing are refused at the administrative level, before peer review, on either the lack of medical relevance, or if medically relevant, on grounds of eugenic tendencies. Any grant application implying environmental release is simply refused.

How, in a technologically advanced, economically stable and philosophically mature country like Germany, could these shackles have been forged?

The problem may be rooted, in part, in the classic dichotomy between arts and science. Herman Hesse's parodies on higher education and elitism have much to answer for: in *Magister Ludi* the ultimate academician is isolated from the realities of his environment; and in *The Prodigy* the joys of study are criticized as displacing the "natural" childhood pursuits. The local philosophical matadors, Christina and Ernst U. von Weisaker, have taken up this theme and extended it to "natural" ecosystems, portraying them as inherently fragile entities in need of artificial protection in order to preserve their irreplaceable genetic material. This, when examined closely, is a dangerous concept; if applied to human society, it supports apartheid and ghetto systems. It also ignores the essentially infinite variety inherent in biological systems and the remarkable elasticity of biological communities.

There has too, of course, been a global trend towards public mistrust of the political and industrial establishments. A series of political scandals, industrial spills, and disasters like Chernobyl prepared fertile ground for the growth of environmental awareness. In Germany, Jost Herbig and Jeremy Rifkin (early works) have provided manure for Green evangelism and vigilante mentality. They portray industrialization as one of society's main ills,

in which the profit motive obscures all considerations of public welfare. Other forms of misinformation are rife. Erika Hickel, professor for the history of pharmacy at Braunschweig University, publicly declares that acquired immunodeficiency syndrome is a product of gene technology and that insulin isn't required since diabetes is only a dietary problem.

Extended and committed attempts by researchers to inform the public have had little effect. A negative press—perhaps less hampered than elsewhere in its use of hyperbole—has mobilized public opinion. Media discussion of gene technology—consistently accompanied by loaded images of fetuses, arthritic pigs, and agricultural workers in moon suits spraying strawberries—has eroded the rationality of biotechnology's critics. In the complete absence of any evidence of negative effects of recombinant organisms, some students still feel motivated to hang banners proclaiming production-plant approval as a "license to kill." Predictably, there have been demonstrations about environmental release and the human genome program.

In a survey of German public opinion on current technology in which both the likelihood of a mishap/misuse and the extent of a resultant catastrophe arising from such a mishap were evaluated, gene technology ended up in a "danger class" of its own, far above nuclear energy, lasers, chemistry, and microelectronics.

Within this context it may be easier for those abroad to understand the motivation behind terrorist bombings/attacks that have taken place at Cologne University (1985), Darmstadt (1989), Heidelberg (Gene Centre, 1986), and Braunschweig (GBF, 1987, and University, 1986). Easier, too, to comprehend why there was no general outcry when *Weiner* magazine in its December 1989 issue circulated a hit list of the main institutes, companies, managers, and researchers to the 4,000 (its estimate) eco-terrorists in Germany.

The state of affairs in Germany has rarely been presented in public; there is no wish to discourage foreign investment or encourage the opponents of gene technology in their belief that they are succeeding.

For Germany, I offer no optimistic prognosis. The political administration in an election year appears powerless to act. In analyzing the problem and seeking a solution, I entirely agree with Jerry Caulder (*Bio/Technology* 8:80, Jan. '90) that what is lacking is the ability to distinguish the possible from the probable, an ability which must be reinforced as the basis for participating in democratic decision-making. In Germany, this lack is combined with a tendency for dogmatic ideology which is anathema to democratic action; this may be lethal for the development of the technical structures on which the country is so dependent.

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