

COMMENTARY //

BIOTECHNOLOGY IN BALANCE

by Bernard Dixon

Over the years, readers of this journal will all have endured at least a few silly conversations about biotechnology. Some of the most frustrating of mine have been with a particular subset from the extreme Green end of the European political spectrum. The people I have in mind are those lobbyists, self-elected to represent the interests of the Third World, who portray genetic manipulation and allied techniques as symbols of nothing but capitalist acquisitiveness, global plunder, and environmental catastrophe.

Characterised by a fierce and totally humorless determination never to concede the tiniest point to an opponent in debate, members of this subset positively thrive on the unyielding dogmatism with which they caricature biotechnology as wholly reprehensible. Some such activities are employed in policy studies departments of institutions of higher learning. Many come over well on television. All are good for newspaper quotes.

Fortunately, the latter attractions tend to be short-lived, as interviewers grow bored with Messianic certainty. Yet the image of biotechnology as a formidable threat to sustainable economic development on planet Earth continues to circulate. It has been able to take root because, set against an impressive catalogue of promise in crop production, vaccination, and other fields, there are *genuine* concerns about ways in which applied molecular biology, harnessed in short-sighted or feckless ways, could harm the environment and have adverse social and economic effects.

Seldom if ever has this balance of potential for both benefit and harm been more vividly or responsibly portrayed than in *Miracle or Menace?—Biotechnology and the Third World*, a report to be published next month by the London-based Panos Institute (9 White Lion St., London N1 9PD, U.K. Price: £5.95). An independent body funded by benefactors such as the Swedish International Development Authority, the Panos Institute acts as a bridge between non-governmental organisations and official agencies on aspects of development and the environment. It operates through meticulous research and what it describes as the "forceful dissemination" of information—an epithet which the institute has certainly justified during its recent work in highlighting the horrendous problem of AIDS in Third World countries.

One would not have been surprised, therefore, if the Panos Institute, turning its attention to biotechnology, had focused primarily on apprehensions over ways in which this new raft of industrial crafts could aggravate the growing North-South economic imbalance. In fact, the report is remarkably even-handed, coupling graphic descriptions of beneficent technologies with well informed warnings in areas where adverse consequences *can* be foreseen, and with calls for genetic manipulation to be targeted on agricultural, medical, and other goals that are specifically appropriate to the needs of the less developed countries. It suggests, for example, that the yield of

cassava, the root which provides 40 percent of the calories consumed in sub-Saharan Africa, could be quadrupled if genetic engineering techniques, already used to make tomatoes and tobacco withstand viral attack, were harnessed to render the plant resistant to African cassava mosaic virus.

At the very outset, the report rejects the simplistic assertion that biotechnology is simply for "the rich North, whose major companies already control most of the key technologies and aim to turn them into sizeable profits." Instead, readers are briefed on a substantial portfolio of imminent and possible benefits. Some, such as crop improvement, are well recognised. Above all there is the enormous promise of genetically engineered vaccines to combat what WHO Director-General Hiroshi Nakajima calls the "silent genocide" caused by communicable but preventable diseases among children in the South.

Less familiar is the assistance which biotechnologists could provide in programs to save the world's forests—e.g., by making clones of old, highly productive trees. At present, tree breeding programs are rather hit-and-miss because cuttings taken from mature specimens usually fail to thrive. Although cuttings from juvenile trees do grow, it is difficult to predict whether or not such trees will be highly productive. Biotechnology could also enhance the rooting and survival of trees in unfavorable terrain.

A particularly attractive feature of *Miracle or Menace?* is the inclusion of many short case histories from around the world. Who knows, for example, that in one rural valley in North Vietnam, tissue culture of virus-free, high-yield potatoes has become a cottage industry, producing millions of plants for the region's farmers more cheaply than imported seed potatoes? Or that Malaysia is planning to establish a complete tissue culture and regeneration process for rattan, a climbing palm used in making furniture and partitions for the Japanese market?

There are just a few sour notes in this crisply written document. Thus a member of the Oxford Forestry Institute in the U.K. is quoted as blaming "commercial greed" for technical setbacks to Unilever's (London) oil palm cloning project, but he or she is not named. Neither are "other scientists" who were "amazed that Unilever risked changing the culture regime"—although what this means is simply that the company tried (and failed) to scale-up its system for producing elite palms. Likewise Donald Boulter's work with cowpea trypsin inhibitor (*BioTechnology* 7:630, July '89) is described as "gene plunder."

Nevertheless, the Panos Institute's overall conclusions are as admirable as its central analysis is sound. Biotechnology is "neither a demon nor an angel. It should not be attacked as entirely a scourge of the poor, or as an unmitigated environmental disaster. Neither should it be uncritically embraced as a panacea, an instant provider of food, medicine, and wealth." Those sentiments bear repetition—not just in the Third World, but in the privileged North, too.