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by Bernard Dixon

THE CRUEL CAPRICE OF SCIENTIFIC FASHION

Although they deny it sedulously, scientists are almost as vulnerable to fashion as are composers, actors, and clothes designers. Internal logic is not the only force that propels their craft forward. Random happenings and fashionable notions, whether internal or external, play their part too. So, from time to time, particular ideas and even words come to exercise numinous power over the scientific enterprise. I happened to be doing my doctorate during the cancer craze of the 1960s and saw all too clearly how this influenced the phrasing of both grant applications and research papers. Still vivid in my memory is one funding request which argued that, because biotin-starved yeast grew poorly, and because malignancy could be categorised as disorderly growth, a famous charity concerned with cancer should finance intensive investigations into biotin metabolism in *Saccharomyces cerevisiae*.

Sensitive souls have always agonized over whether or not to play the fashion game. Nowadays, surrounded by biotechnological hype, the choice is even harder. Do you join in, program your word processor with symbolic buzz words, and promise limitless energy today and an end to world hunger tomorrow? Or do you embrace realism, caution, and honesty instead? Take the first course and you may prosper—or come a fearful cropper over spectacular expectations duly unsatisfied. Take the second and you may miss the boat—or receive unexpected plaudits for your sober practicality.

The dilemma is even starker for someone working in a climate of government parsimony towards science and at a time when shrinking resources are being channeled increasingly towards work with clear industrial implications. Consider the saga of John Palmer, professor of plant biochemistry at Imperial College London. Since 1980, in response to pressure on U.K. universities to undertake "useful" research, he has been studying and revealing how ligninase from the white-rot fungus *Phanerochaete chrysosporium* breaks down lignin. Demonstrating en route that the enzyme is best categorized as a peroxidase and not (as previously thought) an oxygenase, he and his team have won an international reputation for studies whose potential practical applications range from upgrading low-value oil residues to detoxifying environmental pollutants.

But Professor Palmer has always tempered enthusiasm with reticence—especially in the face of sporadic media frenzy about all of those benzene rings, locked up in lignin molecules throughout the biosphere and just waiting to be released. Even *New Scientist* (16 May, 1985) has announced that ligninase "could make biotechnologists rich," that "white-rot fungus could revolutionise the chemical industry," and that "it is difficult to overstate the importance of lignin as a natural aromatic polymer." Well, maybe. But during their early years the Imperial College researchers have been content to focus attention on a more immediate conundrum. How, in light of the exquisitely orderly stereochemistry that usually governs the interaction between an enzyme and its substrate, does lignin's chaotically random structure succumb to enzymatic attack? As described at length in *FEBS Letters* (**183:**7 and 13, 1985) Palmer and his colleagues Pat Harvey and Ruth Bowen, together with Hans Schoemaker of Dutch State Mines, have now largely answered that knotty question. At the same time, they have developed a general theory of peroxidase action which may prove valuable in harnessing other such enzymes for industrial purposes.

In other words, John Palmer's team has been engaged in a typical example of strategic research. Neither mission-oriented applied science, nor curiosity-oriented pure science, this is the sort of investigation that yields the understanding of underlying phenomena which—one day—will be turned to practical advantage. Its promise and relevance are obvious, though no one can make an infallible forecast of the precise date upon which the benefits or profits will begin to emerge. Equally, this is the type of activity which any financing body, whether private or public, can terminate overnight with no adverse repercussions whatever—other than to morale within the laboratory concerned.

That is what has now happened. The U.K. Science and Engineering Research Council (SERC), which backed the Imperial College project at the outset, has decreed that in future Professor Palmer's ligninase work ought to be supported mostly by industrial companies. At the same time, industry insists that the SERC should provide the greater proportion of funds. Both wish to see it continued. Yet neither seems prepared to provide adequate finance.

The loss is largely a loss to Britain, however, rather than to bioscience as a whole. John Palmer has not only seen newly-fledged Ph.D.s leaving immediately after qualifying to work in the U.S. (there's nothing new about that). He has also had to witness the gradual translocation of this particular specialty across the North Sea to a friendly but more far-sighted neighbor, the Netherlands. Collaboration with Dutch State Mines came about as U.K. funds began to expire, with industry and the SERC disputing who should pick up the tab. Now, as domestic finance has dried up altogether, Palmer has had the bitter-sweet experience of receiving cash from the Dutch company for one of his team specifically to assist in transferring the ligninase technology to the Netherlands, where the work will continue.

In one of their recent papers (*Ann. Proc. Phytochem. Soc. Eur.* **26:**249, 1985) John Palmer and his colleagues suggested that their enzyme "lends itself to the process of systematically developing new structures of the polymer, thereby leading to the development of new products from lignin." They must now be wondering whether greater textual flamboyance might have served their interests better than this cool reserve and objectivity.

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