

# British Biologists Learn Small Is Not Beautiful

*A plan to end the "Balkanization of biology" would sweep small departments into large units of at least 20 faculty*

Nottingham, UK

THE PRINCIPLES OF EVOLUTION are thick in the air of Nottingham University's genetics department these days—not as they apply to lower organisms but to the department's eight scientists, who are caught in their own struggle for academic survival.

Their existence as an independent academic group—and the future of genetics itself as a distinct discipline—is endangered by a campaign to sweep the richly evolved phyla of academic biology into no more than two tightly knit family groupings—"B" departments that would concentrate primarily on cells, whole organisms, and ecological topics, and "M" departments that would be organized around molecular biology.

"For some people, big departments may be best, but in other cases, small is best," says Bryan Clarke, genetics department head at Nottingham. Extending the evolutionary metaphor, he says: "In an environment which is not remaining constant, it is the smaller groups which are more easily adaptable and can change direction more quickly." Since, to Clarke, genetics is a field in flux, the conclusion is clear: "In the most active parts of science, you want the most flexible groups. The most important thing is to have diversity, because if you remove diversity, you remove the possibilities for evolution."

Lecturer Thomas Day draws on similar language to make his case. "If people are working highly productively in a small unit, for God's sake don't break it up. Let natural selection take its course."

The focus of the Nottingham scientists' concern is a report sent 2 weeks ago to the vice-chancellors of all British universities by the Universities Funding Council (UFC)—established in 1989 to take over responsibility from the previous University Grants Committee for distributing government funds to universities. The chairman of the authoring committee, Sir Richard Southwood, Linacre Professor of Zoology at the University of Oxford, writes that the objective—already recognized by some major universities in the United States and the UK—should be to reverse the "Balkanization of biology."

Like previous reports on the earth sciences, physics, and chemistry, this one is intended to be the first step in a rationalization of university biology departments, reflecting pressure from the government to improve the management of science education.

In Britain today there are almost 300 departments engaged in different aspects of biology, operating under at least 100 different titles, many with only a handful of

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academic staff. "This fragmented pattern in the biological sciences is in stark contrast to that found by our colleagues in reviewing physics and chemistry, and one has to ask whether this is a necessary and beneficial feature of the biological sciences," writes Southwood in his report. "We are convinced that the answer is in the negative."

Southwood proposes that all biological activities be brought together into unified departments of at least 20 faculty members each, compared to a present median size of 10 to 12 staff.

More controversial is Southwood's recommendation that biology departments be classified into B and M departments, one concentrating on cells and organisms and the other on molecular biology. All universities considered strong in biology would be expected to have at least one department of each type, linked together in a single school of biology. Conversely, a university would only be permitted to maintain one type of biology department if it also had an active chemistry department.

Many UK biologists support the idea of closer integration. "It seems to have been some strange evolutionary quirk that set British biology off in the direction of a large number of small university departments," says Brian Follett, professor of zoology at the University of Bristol and biology secre-

tary of the Royal Society. "Most of us are more struck by the unity of biology rather than its diversity, and in many cases it is worth cementing this unity."

Steven Rose, professor of biology at the Open University, agrees that both teaching and research in biology can suffer from excessive fragmentation and from the intellectual reductionism that often results. "Any move towards an integrated biology makes sense; I agree with Southwood that we should be setting up large biology faculties with bits of everything being covered."

At Nottingham, however, small remains beautiful. "There is evidence that small departments can be very efficient in both teaching and research," says Day. "We are about half the size of other biology departments in the university, but we have no problems with administration. We do it all over a cup of coffee."

And others in the department say that there are intellectual advantages in keeping groups small, particularly in a field such as genetics which requires a cross-fertilization between different approaches. Population geneticist John Brookfield points out that since no genetics department in Britain has more than 20 staff members, Southwood's proposal would eliminate them all as separate academic units.

"The danger is that geneticists would always be in a minority in larger departments," he says. "There is always a basic feeling of what a department is about, and if you are in a department with three geneticists and twelve zoologists, then the zoologists' agenda is going to become the one that matters, and the geneticists are likely to be reduced to a service role."

But even if many biologists disagree on the question of size, there is broader support for the Nottingham scientists' second criticism, namely that separating the "molecular" from the "whole organism" approaches to biology could undermine the close linkage between the two that genetics and modern biology require. "Such a division would be tragic for genetics departments, almost all of which would be split into two," says Brookfield.

David Cove, professor of genetics at the University of Leeds, says he agrees with the basic criticism. "Dividing biology departments into two distinct types, the 'molecular' and the 'whole organism' approach, is ridiculous, particularly since most of the major advances in biology tend to come from the interface between the two areas," he says.

According to Cove, the view expressed at a recent meeting in Birmingham of over 50 heads of university biology departments indicated that, "apart from those at the two

extremes" of pure molecular biologists or field biologists, respectively, "the bulk of scientists feel that the [proposed M/B split] is the wrong approach."

Supporters of Southwood point out that the Southwood report itself draws attention to the need for core studies in both B and M departments to include topics belonging to the other. The recommendations also tie in with arguments in favor of giving responsibility for funding all biological research—now divided among four councils in the UK—to a single council.

Whether the reforms will take hold is not yet clear. Officials at the UFC in London are now waiting for comments from the universities before deciding whether Southwood's proposals should be accepted as the broad framework of a more detailed review of individual biology departments. The universities have until the end of July to respond.

The Nottingham geneticists, having watched recent moves by the UFC to close down or merge small earth science, physics, and chemistry departments, fear the worst. "People may say that our arguments are just those of geneticists who are trying to defend their interests, and to an extent that is true," says Clarke. "But our interests are based on what we believe is the right arrangement for genetics; after all, that is the way we have evolved."

■ DAVID DICKSON

## Space Council Backs Landsat

As its first official act, the new National Space Council has unanimously recommended long-term federal support of the Landsat remote sensing satellites. The vote was taken at a 12 May meeting of the interagency group in the offices of its chairman, Vice President Dan Quayle.

If accepted by President Bush, the council's recommendation would translate into \$25 million for the continued operation of the current satellites, Landsats 4 and 5, plus \$73.4 million for the completion and launch of Landsat 6 in 1991. The money would be paid as a previously agreed upon subsidy to the EOSAT company of Landover, Maryland, which has been working since 1985 to commercialize Landsat.

The recommendation would also mark a sharp reversal of the Reagan Administration's efforts to cut Landsat loose from that subsidy. The council was reportedly convinced by the fact that few private Landsat customers have emerged, whereas federal agencies are spending \$7 million per year to use the data for environmental, resource estimate, and classified applications.

■ M. MITCHELL WALDROP

# Fire Devastates Jackson Lab

*If you have a standing order for a hundred mice every Monday morning, you're in trouble*

FIVE HUNDRED THOUSAND research mice perished when fire swept the mouse production building at the Jackson Laboratory in Bar Harbor last week. Although a few breeding pairs of every type are safe, as are the lab's array of chromosomal mutants including NOD, motheaten, and quaker, scientists who count on a weekly care package of 100 nude mice are out of luck.

The Maine laboratory, which routinely exports more than 2 million mice a year to researchers in 33 nations, is one of the world's preeminent mouse suppliers. For the present, virtually all shipments of science's work-force mice such as the immunologically deficient nude mouse, and the basic C57Black, are on hold. Jackson scientists say it is "very optimistic" to estimate that the production facilities will be back up to 50% of capacity within a year. Other suppliers of science's most trusty mice may not be able to gear up production quickly enough to avoid delays in some areas of research.

The fire started about 1:15 in the afternoon on 10 May, apparently caused by the explosion of a propane tank in an area of the mouse house that was being renovated. Within minutes a human chain of mouse caretakers and researchers was on the scene, literally passing precious "foundation stock" of breeding pairs of the lab's mutant strains from hand to hand to get them out of the burning building. About 300 boxes, or some 1200 mice, were rescued.

This is the second time fire has taken its toll on the laboratory. In 1947 a raging blaze that caused major destruction over miles of Mt. Desert Island wiped out the lab's entire mouse colony. Then, researchers all over the world who had JAX mice voluntarily returned breeding pairs so the colony could be restored.

This time, the chore of reproducing millions of mice will be made easier by the fact that the foundation stocks and unique chromosomal mutants are intact. Nevertheless, the challenge to research is substantial.

Larry Mobraaten, who heads the breeding program, has already put out the word that the lab would welcome any donated space from institutions that might have some unused rooms in their own animal facilities. In addition, Jackson mouse breeders will be contacting their research customers to see whether some people will be able

to carry on by breeding their own animals until the lab's supply is built up.

However, the best guess is that this might work only on a hit-and-miss basis. Several strains of mice are notoriously difficult to breed, and it may not be possible to duplicate the unique environment of the Jackson



**Mouse catastrophe.** Hundreds of thousands of animals were lost in the 10 May fire.

mouse house which caters to a mouse's every whim when it comes to diet, lighting, and temperature. As Yale University mouse geneticist Frank Ruddle puts it, the lab's inbred mice, by very virtue of inbreeding, are not always "sturdy" creatures and getting them to reproduce can be tricky.

And cost is an issue. To get a C57Black shipped from Bar Harbor costs less than \$5 a mouse. A nude mouse, more difficult to breed, goes for \$25. But the cost of setting up even a small mouse room is substantially more. The standard cost of mouse maintenance is 15 cents per mouse per day; a modest breeding colony can cost \$100,000 or more a year.

Researchers, meanwhile, have few options.

They can defer experiments, scale them back, or try to purchase animals from other