

US biotechnology

Research centre gets fixed home

Washington

ON an unseasonably cold, blustery day last month in the Washington suburb of Rockville, the proud parents of the Center for Advanced Research in Biotechnology (CARB) held a ceremonial groundbreaking of what will some day be CARB's new home. A joint venture of the National Bureau of Standards, the University of Maryland and the local county govern-

Information technology

New institute

FINAL preparations are being made for the opening of Britain's first higher education institute devoted to the research and teaching of information technology (IT), the marriage of telecommunication and computer disciplines, supported entirely by industry and by its users.

The new institute, to be based in Milton Keynes in Buckinghamshire just north of London, has been possible through an initial tranche of £3.5 million from more than 25 companies in the IT field, in an attempt to reduce the growing shortage of IT skills in the United Kingdom.

The institute has been created in partnership with the Cranfield Institute of Technology in Bedfordshire, whose vice-chancellor, Sir Henry Chilver, has been the chief driving force behind the project.

The institute is a new dimension in British higher education and one that has provoked detectable hostility from some in established academic institutions who suspect that industrially-funded education, the preference of the Prime Minister Mrs Margaret Thatcher, will undermine the already shaky finances of the British educational establishment.

Supporters of the institute, however, consider that its curriculum will be more appropriate to the needs of an industry already desperately short of key skills, and that its existence will lighten the burden now falling on traditional education institutions, which have been unable to satisfy the appetite of industry.

The future of the institute will depend on whether it proves to be commercially viable, which is reflected in the management structure. A managing director, Dr Allan J. Fox, reporting to a board, replaces the conventional hierarchy of vice-chancellor and senate. Fox was previously deputy director (applied physics) at the Royal Signals and Radar Establishment at Malvern.

Initial areas of research are to include software engineering, parallel processing, artificial intelligence in computers and the communications of computers linked through networks.

Bill Johnstone

ment. CARB will focus initially on protein engineering and rational drug design.

For now, CARB is housed in temporary quarters in Gaithersburg, Maryland, on the campus of the Bureau of Standards. CARB director Kevin Ulmer says the centre will take advantage of the bureau's expertise in fine measurement technologies, essential to making detailed protein structural determinations. The bureau also possesses a CYBER 205 supercomputer needed to make calculations for modelling of atomic interactions in protein molecules. Ulmer says that CARB will provide the bureau with a window into biotechnology, an area in which it has not traditionally had a very large presence.

For the University of Maryland, CARB is only one aspect of a major thrust in the realm of biotechnology. The Maryland Biotechnology Institute includes centres devoted to marine biotechnology, agricultural, medical and ethical aspects of biotechnology in addition to CARB. The university's 1987 budget allots \$5.6 million to these institutes, including provision for 75 full-time positions. Rita Colwell, university vice president for academic affairs, says Maryland is a logical place to house these centres, because the 50-mile corridor between Washington and Baltimore is rich in biotechnology companies and government research laboratories.

Montgomery County, where CARB is located, is also trying to take advantage of the population characteristics of the Baltimore-Washington corridor. The county has created the Shady Grove Life Sciences Center, and is providing funds and space to both the University of Maryland (50 acres) and John Hopkins University (35 acres) for new campuses, has begun work on what will be a teaching facility for high-technology graduate programmes, and the University of Maryland has begun CARB. County officials say the idea is to compete with the San Francisco Bay area and the Boston area for biotechnology companies. Montgomery County is home for the National Institutes of Health, the National Bureau of Standards and the Food and Drug Administration. Some four dozen biotechnology companies have already located in the county.

CARB's major initial thrust — protein structure — has in just the past two years been an area of intense interest. Thomas Steitz of Yale University calls the resurgence of structural biology "spectacular". Steitz attributes the renewed interest to strides in molecular biology that have provided large quantities of molecules of interest for study. Ability to perform site-directed mutagenesis has spurred efforts to derive a theoretical understanding of how DNA sequence changes would affect

the structure of the resulting protein.

But the increased interest in structural biology means that CARB will face stiff competition for personnel and funds. CARB has offered positions to seven scientists to form its senior staff, but so far only one has accepted. Ulmer admits it is hard to persuade industry to enter collaborative projects without a full staff on board. The National Bureau of Standards and the University of Maryland will together provide CARB with about \$3 million annually, but Ulmer hopes to increase that figure several-fold through contracts and grants from both government and industry.

Raymond Salemme, who directs Du Pont's efforts in protein structure, says

Alaskan environment

Long row ahead

Washington

THE first salvo in what is likely to be the major energy debate of 1987 was fired last week when the Department of the Interior recommended leasing 1.5 million acres of the Arctic National Wildlife Refuge in Alaska for oil and gas exploration. The government believes the land lying along the northern Alaska coast could be "the most outstanding oil and gas frontier in North America". But environmental groups call the same land a unique treasure house of wildlife, and doubt whether the area can be developed without severe ecological disruption.

Since 1980, when Congress set aside 17.9 million acres of Alaskan land for a wildlife refuge, the government has been struggling over what to do about its coastal plain. Environmental groups wanted the land declared a national wilderness, putting it off limits for oil and gas exploration. But the Interior Department's report proposes a full leasing plan, arguing that industry can conduct its operation in a way that will minimize environmental damage.

The report argues that the national need for oil and gas makes development of the coastal plain essential. A 150-mile pipeline would carry oil from the eastern boundary of the coastal plain to the head of the trans-Alaska pipeline at Prudhoe Bay.

Alaskan politicians are enthusiastic about the Interior Department's plans. The Alaskan economy is in the doldrums. The government's report maintains that oil exploration in the coastal plain will reduce US dependence on foreign oil, enhance national security and bring a more favourable balance of trade.

The coastal plain is inhabited by a wide variety of fauna, including bears, polar bears, musk oxen, foxes, sheep and migratory birds. But development will have the greatest impact on the Porcupine herd of some 180,000 migratory caribou. Appro-

most industries have been disinclined to contract with start-up operations, choosing instead to launch in-house divisions. Salemme believes the interest now being shown by the Howard Hughes Medical Institute in structural biology will create academic laboratories that will compete with CARB.

Interest in protein structure is not limited to the United States. Japan has created the Protein Engineering Research Institute that Ulmer says will have an annual budget of \$10 million. In Europe, John Tooze of the European Molecular Biology Organization says that more attention will be directed towards structural work at his facility.

Joseph Palca

on oil leases

ximately 272,000 acres, or 78 per cent, of the herd's core calving area lies within the section of the refuge proposed for leasing. The report acknowledges that the impact on caribou number is "uncertain" even if care is taken to avoid disrupting the herd's movements. The report cites successful industry wildlife management at nearby Prudhoe Bay as evidence that the caribou population will not be decimated.

But Susan Alexander of the Wilderness Society says the experience at Prudhoe Bay is not relevant to the coastal plain. She argues that the principal herd at Prudhoe Bay, the Central Arctic herd, is resident, whereas the Porcupine herd is migratory. The Porcupine herd is also much larger than the Central herd but has a relatively small core calving area. Both factors, Alexander says, make the Porcupine much more susceptible to environmental change. Although assistant Interior secretary William Horn has proposed leasing the calving area last, Alexander says the damage will already be done if leasing is permitted on the range.

There is a 60-day public comment period for the report that expires on 23 January, after which it will go to Congress, sometime in the spring. Congress must approve the plan, and will probably hold its own hearings.

Representative Morris Udall (Democrat, Arizona) is likely to reintroduce legislation that would convert the land from wildlife refuge to wilderness, forestalling energy exploration. Similar legislation died earlier this year. As chairman of the Interior committee, Udall will have a powerful voice in the ultimate disposition of the land.

Alexander says a "suck-America-dry-first" policy is folly, because even Alaskan oil reserves will run out eventually. The coastal plain is a unique place, she says, one "we can afford to leave until the end".

Joseph Palca

Laboratory fraud

Another damned by publications

San Diego

THE University of California is still trying to pick up the pieces after what appears to have been an extensive scientific fraud which has left the medical school at the campus here (UCSD) severely shaken. Although the case has nothing in common with that which came to light two weeks ago at the Dana-Farber Cancer Institute of the Harvard Medical School (see *Nature* 324, 197; 1986), scientists are asking if the two cases may have been caused by pressure on investigators to publish.

The now-published report of the university's investigating committee, chaired by thoracic surgeon Richard Peters, into the San Diego fraud has revealed that as many as 68 papers published by former UCSD cardiologist Robert A. Slutsky must be considered questionable. Some of them contain fabricated data.

One of the distinctive features of the Slutsky case is Slutsky's use of what the committee calls "gift authorships", the practice of listing as co-authors colleagues who had made little or no contribution to the work, who could not vouch for its accuracy and who, in some cases, were not aware that their names had been used until the papers carrying them had been submitted for publication.

According to the committee, in the period 1983-84 Slutsky (then 37) was averaging one published paper every 10 days. The committee notes that this pace of publication went unremarked.

Although some of the co-authors were at the outset unaware of the 'gift' of co-authorship, the committee says that others questioned during its year-long investigation freely admitted to the practice of listing as co-authors senior scientists who had contributed nothing more than equipment or laboratory space to the work reported. This practice, it says, is "commonplace and condoned".

As a remedy, the committee recommends that each university department should take responsibility for specifying the participation of each faculty author in the work described in every paper submitted for publication. It says that co-authors should be responsible for reviewing all manuscripts carrying their names and should be able to vouch for the accuracy of the work. During the investigation, the committee says, it summoned Slutsky's co-authors to defend the papers on which their names appeared, but some of those concerned objected. Peters says that the notion of "innocent until proven guilty" does not apply in science.

Peters also says that the problems at the San Diego medical school could and should have been discovered earlier. The failure, he says, is less in the research

enterprise than in the senior scientists who lead it. Paul Friedman, the medical school's dean for academic affairs, said that some of Slutsky's colleagues had been suspicious of the quality of his work but that they "were simply bowled over by his energy, his enthusiasm and the size of his bibliography".

Slutsky's fabrications were apparently uncovered when he was being considered for possible promotion. Radiologist Elliot Lasser set two Slutsky papers side by side and noticed that, in two overlapping data tables dealing with control animals, the numbers of animals were different but the standard deviations were identical.

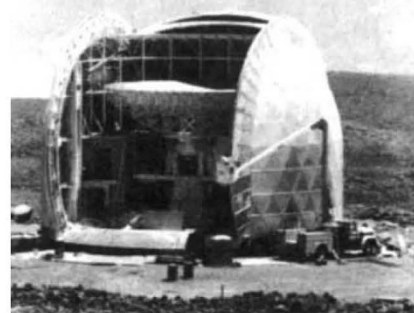
In retrospect, it has emerged that Slutsky's earlier work shows small discrepancies, as when the same data have been reused or the statistical significance of a result exaggerated. In the end, says Friedman, it emerged that the experiments simply had not been done.

Friedman says that Slutsky was caught because he did not understand statistics, and that he had survived for so long only because journals' reviewers also lack statistical expertise. Slutsky seems to have been successful because he stuck to experiments that he knew would work.

But Slutsky regularly ignored requests for supporting data, for which reason Friedman suggests that the retention of raw data should be a university requirement. He also says that young researchers should be given an estimate of what would be a realistic output of publications.

Friedman is concerned that Slutsky's unsound papers may be only the tip of an iceberg. He says that only the blatant fabrications are usually caught, so that nobody knows how many more cautious investigators cook their data in ways that escape detection. He says that the familiar use of expressions such as "dry-labbing" suggests that fraud is "not an extremely rare phenomenon".

Robert Locke



THE California Institute of Technology (Caltech) Submillimeter Observatory (shown during construction), a 10.4 metre dish that will operate at wavelengths down to 200 micrometres, was dedicated on 22 November on Mauna Kea, Hawaii. □