

most industries have been disinclined to contract with start-up operations, choosing instead to launch in-house divisions. Salem 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.

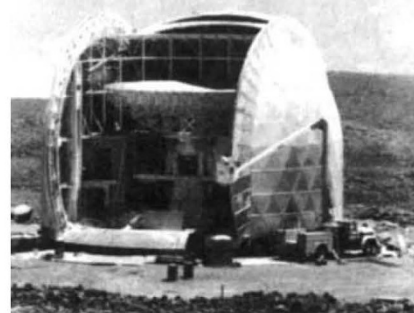
In retrospect, it has emerged that Slutsky's earlier work shows small discrepancies, as when the same data have been reused or the statistical significance of a result exaggerated. In the end, says Friedman, it emerged that the experiments simply had not been done.

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. □