

Academics agonize about weapons labs

Livermore and Los Alamos up for grabs

San Francisco

In what promises to be another stormy round in a long-running debate, the Board of Regents of the University of California is meeting next week to discuss how it should increase its control of research programmes at the two weapons laboratories which the university runs for the Department of Energy (DoE).

The present five-year management contract for the two laboratories — at Livermore and Los Alamos — runs out in 1982, and preliminary moves to negotiate a new contract with the department have restimulated discussion of the implications of the university's responsibility for the research that underpins a major part of the world's nuclear arsenal.

Last year, the Board of Regents, which is responsible to the state for the university's affairs, rejected a proposal from *ex-officio* member Governor Jerry Brown to remove all military research from the Lawrence Livermore Laboratory, and in September voted to open discussions with DoE for a new contract. The focus of debate has therefore shifted from whether the Livermore Laboratory should be carrying out weapons research at all to how the university should exercise its management responsibilities over this research. In particular, opinions differ about the extent to which the Board of Regents — and possibly outside advisers — should be involved in determining research priorities for the laboratory.

Under the present arrangement the university accepts responsibility for the quality of the research but leaves priorities almost entirely to DoE, a situation which many scientists and administrators at the laboratory are reluctant to see changed. "If a car is running well, you don't tamper with the engine", one Livermore official said last week.

Some members of the university faculty are, however, concerned about the lack of control over military research programmes. The autonomy enjoyed by the laboratories under the protection of the university was described in a report as "so delightful as to border on the licentious". More recently, a group of laboratory staff at Livermore, known as the Society of Professional Scientists and Engineers, has suggested that there should be greater outside monitoring of research.

At the same time, the university is keen to keep a contract which brings in \$4 million a year in management fees, and it

points out that several recent reports, including one prepared by the department's Energy Research Advisory Board, have concluded that it is in the best interests of both sides that the basic links with the university be maintained.

At its meeting last month, the Board of Regents received two proposals for modifying the relationship. Professor William Fretter, the university's vice-president, suggested that the regents appoint a new oversight committee to "provide increased accountability to the general public", and that this committee establish three evaluation committees, one of which would be responsible for establishing research priorities.

The second proposal came from Governor Brown and is based on the report of a committee which the university itself set up in 1978. Like Professor Fretter, the governor also proposes a new oversight committee, but this time assisted by an independent advisory board.

The two proposals agree on many points, but also have significant differences. For example, while the evaluation committees proposed by Professor Fretter would essentially be subcommittees of the oversight committee, Governor Brown's advisory committee would have much greater autonomy, being empowered to request that the oversight committee help it evaluate particular programmes or problems.

The composition of the proposed committees would also differ significantly. The evaluation committees proposed by Professor Fretter would chiefly consist of experts from within and outside the university. In contrast, Governor Brown

contemplates an advisory board of scientists, faculty members, students, health experts, theologians and others.

The president's office is now deciding whether the two proposals can be combined. Otherwise, the choice between the two approaches will have to be made by the regents.

Whatever the result, increased control — at least of research not related to weapons, which forms about half of the work of both laboratories — seems inevitable. The university's president, Dr David Saxon, has already proposed setting up a panel of scientists to recommend research priorities in energy research and other unclassified areas at the two laboratories.

More controversial is the extent to which an oversight committee should be involved in policy decisions about weapons research, which is shortly expected to include work on the MX missile system. Here both university and laboratory officials argue that all such policy decisions must be made at the national level in Washington, and that the laboratories should only carry out Washington's requests.

Critics point out, however, that in the past laboratory officials have been far from neutral in policy debates over weapons research and related areas of arms control. For example, pressures from the two weapons laboratories were significant in reducing the scope of the Comprehensive Test-Ban Treaty now being negotiated in Geneva, while other laboratory officials have been active in the debate over whether to ratify the Strategic Arms Limitation Treaty (Salt II).

David Dickson

Short commons for Spanish research

A ten-month freeze on research grants for scientists in Spanish universities and the Spanish National Research Council ended on 20 October with the distribution of 3,600 million pesetas (£22 million) to groups in the universities and the research council. The average of £24,000 per group must officially last three years — although the period may in practice be longer. Grants were last awarded in 1976.

The distribution has come in for some severe criticism, particularly from members of the group of 200 leading scientists who, just before the grants were announced, had sent a manifesto to the Minister of Universities and Research describing his policies as "derelict" (*Nature* 23 October, p.674). The group now says that the meagre distribution is no surprise. Spain historically has spent only 0.3 per cent of its gross national product (GNP) on research and development compared with about 2 per cent in other Western countries. Passions have,

however, been stirred by the way in which this distribution has been made.

One member of the group says that a key advisory body has been ignored, and that grants have been awarded by subject panels which were not best qualified to make judgements. The result has been a largely random distribution of money, he claims. Some of these discontents were aired at the meeting on European Economic Community (EEC) science policy held two weeks ago in Strasbourg.

The advisory body, the Gabinete de Estudios, was set up four years ago by the now deputy director-general of the United Nations Educational, Scientific and Cultural Organization, Professor Federico Mayor, to provide baseline studies of science in Spain and to advise the Comisión Asesora de Investigación Científica y Técnica (CACT), which distributed last month's grants. But the Gabinete's recommendations of referees for the grant applications were rejected, said the

manifesto spokesman, and CACT took other advice about the composition of the panels of referees.

One curious feature of the grant-making process is that the director of CACT, Professor Marcos Rico, demanded that nobody who was applying for a grant should serve on a review panel. The manifesto group complains that no scientist worth his salt would not be applying after a year without a research grant. The head of one of the panels has since written to one unsuccessful applicant (who with a similar proposal won DM265,000 from the Volkswagen Foundation) to say that a lottery would have been equally fair.

On the other side, the Ministry for Universities and Research claims that the



Seara — handing out

manifesto group is the naive political tool of the far Right, which wants to unseat the minister, Luis Gonzalez Seara, for his attempt to reduce professorial power with a bill now before parliament.

Seara's chief science adviser, sociologist Narciso Pizarro Ponce de la Torre, said at the Strasbourg meeting that his ministry (like Spanish democracy) was new and that the power of the Francoist professors was great, so that change had to be slow. Even so, the ministry is preparing a major policy statement, the "livre blanc", on science for May 1981, together with a three-year plan that would multiply university research tenfold. But, said the manifesto group spokesman, the same has been said before, by three successive ministers: he will not believe it until it happens.

The seriousness of this conflict cannot easily be gauged. Narciso Pizarro accepts that a "more scientific" method has to be found for making the next allocation of grants. He is considering the appointment of international referees to some of the review panels for the next grant allocation in 1983. But he argues that the international community can itself be an inequitable power base for those with access to it, and wants to see a "just" distribution of funds. So does the manifesto group, although its wish that scientific excellence should be rewarded is seen as elitist in a fledgling democracy. The conflict is between the impatient and the gradualists.

Robert Walgate

US radioastronomy

Thinking big

San Francisco

Following the successful completion and inauguration of the Very Large Array (VLA) telescope in New Mexico last month, US radioastronomers are developing an ambitious scheme that would, in effect, turn the country into a single large radio telescope.

The VLA is designed to study relatively close objects whose distance from the Earth is of the order of thousands of light years. But to study the internal structure of quasars and the nuclei of galaxies the necessary resolution can only be achieved by the use of Very Long Baseline Interferometry (VLBI) in which data from several telescopes are combined to form a single image.

To some extent this can be done by linking existing telescopes, and since 1975 seven US radio telescopes have formed such an array. But there are several disadvantages, including the difficulty of coordinating and correlating data from machines designed and built for different purposes.

The new proposal, which has been developed by scientists from the California Institute of Technology (Caltech) and its Jet Propulsion Laboratory (JPL), is for a transcontinental array of ten 25-metre radio dishes, stretching from Massachusetts to Hawaii and controlled by a single central computer.

Such an array should provide an order of magnitude leap in the important parameters that could be measured compared with the data that can be collected from the present *ad hoc* arrangement. It could be used to provide fine detail radio maps of quasars and galaxy nuclei and also for making precise

Any encounters, any kind

Voyager 1, now nearing Saturn, is far from innocent of messages to extraterrestrial civilizations (in which respect the article on page 9 is incorrect). Like its partner, Voyager 2, it carries a phonograph disk of copper (for long life) with sound recordings of greetings in 60 languages, a spoken message from Kurt Waldheim, Secretary-General of the United Nations, sounds of the Earth (natural, unnatural and musical) and a list of the members of the pre-election US Congress.

The disk also contains analogue tracks representing 100 photographs of the Earth and a message from President Jimmy Carter referring to "our progress towards a single global civilization" and "our wish to become a member of the galactic community". Voyager 1 was launched before the seizure of the US hostages in Iran.

measurements of the Earth's rotation, even providing information on plate tectonics.

The scientific and the economic feasibility of such a transcontinental array has now been demonstrated in a Caltech study which concludes that for extragalactic astronomy VLBI is the only tool available for detailed study of the energy sources in quasars and galaxies.

One feature of the Caltech proposal is that the array would be two-dimensional, with radio dishes as far north as Alaska. This spread will make it possible to cover almost all of the northern sky, in contrast to a Canadian proposal for a similar array with radio dishes essentially on a linear axis from Europe to British Columbia.

Two particular aspects of the array would improve performance compared with the present system. First, being able to locate the individual dishes in an optimal arrangement would make it possible to increase the dynamic range by an order of magnitude. This would allow detailed studies of the shape, size and evolution with time of the jets which are emitted from quasars and galaxy nuclei, in particular the acceleration and deceleration of so-called "knots" which occur within the jets.

The second advantage is that the array would be able to make measurements at frequencies of up to 15–20 GHz, considerably higher than some of the telescopes in the present array can achieve. This will make it possible to look much further down the jets to the surface of the objects from which they are emitted.

Radioastronomers in general are enthusiastic about the proposal for a ground-based array, which has been given top priority for funding in the next decade by the Field Committee responsible for overseeing research priorities in all fields of astronomy.

The main problem, inevitably, will be funding. The Caltech group estimates that the array will cost \$38.8 million, considerably less than other astronomical facilities (VLA, for example, cost \$80 million).

But astronomy, like other fields of basic science, is feeling the pinch. Already the National Science Foundation (NSF) has had to postpone plans for the next telescope on its priority list, a 25-metre dish that had originally been requested for funding in the fiscal year 1981 but failed to survive the budget review process.

There are three other schemes vying for funds. The National Aeronautics and Space Administration (NASA) has been working on plans for an advanced X-ray astronomical telescope, a successor to HEAO 2 and HEAO 3. In addition to the ground-based array, the NSF is already considering proposals for a 10–15-metre optical telescope, including designs that have been submitted by the University of California, the University of Arizona and the University of Texas.

Caltech scientists should have detailed plans ready for potential funding by 1982,