

has since been allocated by Congress, but too little and too late — the revised mission would rely on a ballistic launch, limiting its ability to manoeuvre near the comet.

Many JPL scientists still think the mission would be worthwhile, a conclusion backed up by the mission's science committee, headed by Professor John Ververka of Cornell University. And the proposal has already been put to Mr Reagan by Caltech trustee Earle M. Jorgensen, a Los Angeles businessman and close friend of the president-elect.

Scientists at JPL are stressing the question of national pride, one aspect of the space programme that they feel has received relatively little support from the Carter White House. But other members of the space science community are worried that political support for a fly-by mission could prejudice funding for NASA's own favourite scientific project, the Venus Orbiting Imaging Radar (VOIR).

In an unusual move (considered by many a pre-election gambit to win Californian votes), the White House announced in October that it was planned to request funds from Congress for VOIR when the 1982 budget proposals are submitted in January — implying a rejection of the revised Halley plans.

From the scientific point of view, VOIR is reckoned to be more fruitful than the Halley intercept. Members of NASA's space science advisory committee have already stated that they find the possibility of losing VOIR and getting the Halley mission instead to be "extremely distressing".

In addition, however, to the financial attraction — the present Halley plans would make substantial use of instruments developed for the Voyager missions, and its total cost of \$250 million would therefore be only about half that of the proposed VOIR — JPL scientists point out that the chance to observe the comet is a "once in a lifetime opportunity".

Officials from the European Space Agency (ESA) are watching the new developments with some concern, since they feel that a NASA project might well overshadow the more modest goals of ESA's own Halley mission, Giotto, particularly since the latter may not be able to produce photographs of the comet comparable to NASA's.

A substantial NASA involvement in the European effort is now unlikely. Two weeks ago, ESA's space science committee decided to keep the launch a European affair, using the French Ariane rocket, and were therefore not interested in the US offer of using a Delta launcher in exchange for payload space.

US scientists will not be entirely excluded from the European mission. A number are listed as co-investigators in experiments submitted for inclusion in the spacecraft. And ESA is still negotiating terms for Giotto to make use of NASA's deep space tracking network.

NASA, however, is uncomfortable about accepting the unusual role of second fiddle, and supporters of a US mission are emphasizing this possibility in efforts to generate support. Adding the Halley mission to the 1982 budget for NASA would affirm to the world in a "spectacular and dramatic way" that US leadership in high technology stands unsurpassed at the frontiers of knowledge, according to a statement published in the *Congressional Record* by conservative Republican Senator Storm Thurmond. Another supporter is ex-astronaut Senator John Glenn.

If the mission is given the go-ahead, its planners will have a delicate balance to weigh up. Scientifically, more data will be obtained from intercepting the comet after it passes through its perihelion, since solar heating will stimulate the discharge of gas and dust particles. But politically an earlier intercept might be more attractive, as this would pre-empt both the European and the Soviet post-perihelion encounters.

Top NASA administrators are also said to be concerned about the risks of the mission — if the spacecraft is hit by a dust particle there might be no scientific return at all. Scientific and political priorities are therefore likely to meet head-on; nobody is predicting the outcome.

David Dickson

Polish universities

Union snag

The drafting commission for the new Bill on Higher Education in Poland met for the first time two weeks ago, under the chairmanship of Professor Zbigniew Redich. The commission was set up by the Minister of Science, Higher Education and Technology, Dr Janusz Gorski. A few days previously, Warsaw University students had staged a sit-in in one of the main buildings of the university to express their lack of confidence in the minister.

The two events are not unconnected; the new bill will give Polish universities considerably more autonomy and a more democratic form of self-government which will include student participation. The two hundred students who occupied a hall in the university's Kazimierzowski Palace were protesting, first and foremost, against the difficulties they are encountering in registering the new Independent Students' Union (NZS). Since students are not "employees", they cannot register as an independent trade union under the Gdansk accords. The first draft of the ministry's "instruction" permitting registration of NZS proved unacceptable to the Warsaw students, although it had been worked out with the participation of NZS delegates. When the ministry negotiator suspended talks with NZS, on the grounds that he must first consult the (now greatly depleted) Socialist Students' Union, NZS considered that the ministry had broken

off negotiations unilaterally and began their sit-in.

After occupying the hall for two days, the students won what they described as a partial concession only — a new ministry instruction on registration to come into force on 20 December. This should allay at least one fear — that without legal status, NZS would be unable to participate in the new "self-government" system of the university. Demands for a national NZS delegate meeting on student problems and for the publication of their grievances in the press were not met.

Neither the concessions by the minister nor the conciliation efforts of the university rector, Dr Henryk Samsonowicz could persuade the students to end their sit-in. Ironically, in view of the fact that NZS cannot legally be a trade union, it ended its protest only in response to a call for restraint issued by the Independent Trade Union Confederation Solidarity.

Vera Rich

Fissile material

Counting wrong

Are eleven kilogrammes of highly enriched uranium missing from Dounreay, the UK Atomic Energy Authority's (UKAEA) fast reactor research establishment in North Scotland? The authority cannot say. The amount appears in this year's tally of "materials unaccounted for" (MUF), and is something of an embarrassment. According to the UKAEA, the quantity is within measurement errors on a large throughput, but the throughput cannot be revealed for security reasons and the errors have not been calculated. So it is difficult to give significance to the figure.

All MUF figures announced last week lack error estimates because, an official said on Monday, "errors would have to be combined from many completely different processes and sources".

Nevertheless the 11 kg "loss" at Dounreay was near enough to a critical mass to give the authority pause. In the first three years for which MUF figures were announced, the MUFs at Dounreay for highly enriched uranium were +2.8 kg, +3.7 kg, and +0.3 kg, all indicating paper gains of the material. However, Dounreay was not reprocessing fuel for much of that period, and the present figures relate to the first year (since MUF accounting began) when fuel from the now closed Dounreay fast reactor was being reprocessed.

The figure amounts to a difference between the quantity of ^{235}U estimated to be on the site at the beginning of the year and the quantity estimated at the end, taking into account traffic on and off site. But much of the ^{235}U at the beginning was in the form of irradiated fuel rods, and so inaccessible to measurement. The amount in the rods was estimated using knowledge of their position and operating time in the

Dounreay fast reactor, and of the original composition of the rods. At the end of the year, some of these rods had been through reprocessing: here ^{235}U can be measured easily only at the end of the flow, and by neutron activation analysis in the cans (which are stripped off at the beginning of the process).

When the 11 kg accounting loss was discovered, great efforts were made to recalculate the quantity and check measurements. The new figure was different (the authority will not release it) but it was agreed to keep to the original accounting value. However, the difference was great enough to indicate that the uncertainties in the original estimate were of the same order as its value — about 10 kg. For example, the recalculated figure for ^{235}U in the original rods was 2 kg different from the first estimate.

However, still no calculation was made of the uncertainty, or "error", on the quantity. And this despite a statement a year ago by Dr A. G. Hamlin, director of the UKAEA Nuclear Materials Accounting Control Team, that "in order to determine whether MUF is really indicative of diversion of material, the safeguards authorities need to know, among other things, the expected level of errors. . . .".

Robert Walgate

US research planning

NIH reprieved

Washington

The National Institutes of Health (NIH) have avoided the threat of new legislation which would have placed much closer congressional surveillance and control on their research programmes, proposed earlier this year by the House of Representatives health and environment subcommittee (see *Nature*, 22 May).

After intense opposition from medical schools and research institutes — and despite the support of the Secretary of Health and Human Services, Mrs Patricia Harris — proposals put forward by Subcommittee chairman Henry Waxman were mostly dropped when the bill was agreed in final form by the House and the Senate.

Also dropped were equally controversial proposals put forward by Senator Edward Kennedy on the Senate side for a Presidential Commission on biomedical research priorities. Senator Kennedy had wanted to attach this to legislation which re-authorizes the operations of the National Cancer Institute and the National Institute for Heart, Lung and Blood, the only two of NIH's eleven institutes at present requiring such legislation.

NIH themselves opposed both innovations, but were told by Mrs Harris to sit on their hands. Opposition was subsequently led by groups such as the American Association of Medical Colleges, which argued that NIH should be given the greatest possible freedom to

decide on their research strategies.

NIH did not, however, escape completely unscathed. Included in the authorization bill are requirements for additional administrative arrangements covering diabetes research — a pet subject of retiring health subcommittee member Senator Richard Schweiker, expected to become Mr Reagan's Health Secretary — and for research on digestive diseases. NIH officials feel that one disadvantage of the changes proposed by Congressman Waxman is that regular re-authorization of NIH research funds makes it easier for such provisions to be attacked by individual congressmen.

David Dickson

European environment

Small gains

Brussels

Agreement has still not been reached by the Environmental Council of the EEC on two pieces of legislation: one concerning the prevention of industrial accidents and the other on the level of mercury discharge. However, new controls on whale imports, the recycling of waste paper, and wildlife habitation have been accepted.

At the meeting in Brussels on 12 December, the so-called "Séveso Directive" again foundered on the French intransigence over transfrontier notification procedures. It had been proposed that information on potentially hazardous plants near frontiers should be made available on a Community basis. The French would prefer notification of neighbouring states bilateral — an idea swiftly rejected by Belgium and Luxembourg. This disagreement is bound to step up the campaign against French nuclear reactors near the Belgium and Luxembourg borders.

The directive on mercury is also meeting resistance from France and Britain. The UK delegation insists that environmental quality objectives be used instead of standard emission limits to measure pollution. In the draft directive — the first to be based on the controversial directive on the control of discharges of dangerous substances into the aquatic environment — it was suggested that the United Kingdom stick to its use of quality controls while the other EEC states use the limit value approach. The French, however, object to this, feeling that pollution abatement costs should be the same throughout the Community. Both this and the industrial accident proposals will now go back to the Committee of Nine's Permanent Representatives for further discussion.

On the bonus side, from 1 January 1982 imports of commercial whale products will be banned. Would-be importers will have to apply for a licence not only for primary products but also for any goods (such as leather) which have been treated with a whale product. Denmark's insistence that

Greenland be excepted from this rule was accepted.

A recommendation obliging the nine member states to take steps to recycle waste paper and pulp was also adopted. Inks or glues which adversely affect the recycling process may fall victim should the legislation be seriously applied.

It was also agreed to finalize the Community's adherence both to the Strasbourg Convention (the Berne Convention) on the protection of European wildlife and their natural habitats and to the Geneva Convention on trans-frontier air pollution.

Jasper Becker

High-energy physics

New man, new style

The next director of DESY, the West German particle physics laboratory at Hamburg, will be 49-year-old Dr Volker Soergel, at present a member of the directorate of CERN, the European centre for particle physics in Geneva. Departing DESY director Professor Herwig Schopper announced the appointment during his leaving party at DESY last week.

Schopper moves to CERN in January as director-general; and Soergel will step into his shoes at DESY, even to the point of taking over his predecessor's professorship at the University of Hamburg. But from there on the similarities between the two individuals stop. Schopper had proved himself an extremely able politician in his period at DESY, but is less well known as a physicist; Soergel is a recognized expert on the weak decays of elementary particles, but has yet to learn the ways of Bonn.

However, he is by all accounts an extremely able administrator. According to one ex-CERN physicist, he could complete in ten minutes meetings that should have taken an hour — by resolving conflicts of interest beforehand. In this sense his style is ordered and Germanic. But at the same time, it is said, he can wax enthusiastic "and talk for hours about some harebrained scheme".

At DESY there are plenty of schemes, harebrained or not. A 30-beam synchrotron radiation laboratory opens in January; PETRA, the big electron-positron ring, is being pushed up to 22 GeV per beam in an attempt to find the elusive t-quark; superconducting magnets are being developed; and there are long-term plans for HERA, an 800-GeV proton on 35-GeV electron collider. But first, Soergel must find cash for DESY to pay its electricity bills (see *Nature* 4 December).

Being interested in the weak interaction, he will be keen to run PETRA at the energy where it can take data fastest on weak-electromagnetic interference, and check — in a hitherto impossible way — the Nobel-prize winning Weinberg-Salam unified theory of the weak and electromagnetic interactions. DESY physicists now