merit who wish to devote a half-year or more to study, travel, formal or informal contact with scientists, and so on, to increase their competence.

6) The design of programs to train additional writers to serve public information functions in science for research institutes, medical schools, industrial scientific and technological concerns, voluntary health agencies, and other organizations which conduct programs of scientific research and development.

7) The elaboration of programs to develop science-writing techniques, and trained science-writing personnel, for television, together with research and development aimed at increasing use of audio-visual aids for other forms of science reporting.

8) The organization, on a systematic and continuing basis, of press institutes and seminars to inform newspaper and magazine publishers, managing editors, and newspaper city editors of current developments in science, of the importance of science news, and of the possible methods of presentation of science news and comment.

9) Continuing research on the science-news audience, on the effectiveness of varied techniques and methods of presentation, and on what might be called the "social digestion" of science news—the ways and the groups in which specific information on science is discussed, debated, and evaluated in the citizen's decision-making processes.

To implement this program, a new nonprofit organization was incorporated under the aegis of the NASW last January in the state of New York. Called the Council for the Advancement of Science Writing (CASW), it is empowered to encourage, promote, initiate, coordinate, and even direct projects designed to increase the quantity and improve the quality of science reporting in the United States—or, for that matter, anywhere else in the world.

The board of directors of the CASW (*11*) will include representatives of the NASW, the American Association for the Advancement of Science, the National Academy of Sciences–National Research Council, journalism schools, the medical profession, newspaper editors, and the magazine, book, and radio-TV industries.

At its charter meeting, the CASW assigned top priority to points 2 and 8 on the NASW list, reflecting a conviction that these are the two areas of primary concern at the moment. But no opportunity to advance the scientific literacy of the American public will be overlooked. For as Glenn Frank, the late president of the University of Wisconsin, once stated (*12*): "The practical value of every social invention or material discovery depends upon its being adequately interpreted to the masses. The future of scientific progress depends as much on the interpretative mind as it does upon the creative mind. . . . The interpreter stands between the layman, whose knowledge of all things is indefinite, and the scientist, whose knowledge of one thing is authoritative. . . . The scientist advances knowledge. . . . The interpreter advances progress. . . . History affords abundant evidence that civilization has advanced in direct ratio to the efficiency with which the thought of the thinkers has been translated into the language of the masses."

References and Notes

1. President's Science Advisory Committee, "Education for the Age of Science" (1959).
2. H. Krieghbaum, *Science* **129**, 1092 (1959).
3. President's Committee on Scientists and Engineers, *News Round-up* **1**, No. 15 (1957).
4. R. Calder, "News in the field of science—The case for presentation," *World's News Press, Suppl.* (1959).
5. Personal communication.
6. W. Weaver, *Science* **127**, 499 (1958).
7. A. Blakeslee, *Mental Hospitals* **10**, 13 (1959).
8. K. Lonsdale, *Bull. Atomic Scientists* **14**, 242 (1958).
9. J. Meehan, *Editor and Publisher* **93**, 11 (1960).
10. Report of the Committee on Fellowships and Scholarships, National Association of Science Writers, "Science, the Press and the Citizen" (1958).
11. The board of incorporators of the Council for the Advancement of Science Writing consists of: Roland H. Berg, *Look* magazine; Victor Cohn, Minneapolis *Tribune*; Donald J. Dunham, Cleveland *Press*; Pierre C. Fraley, free-lance science writer, Phoenixville, Pa.; H. Jack Geiger, Newspaper Enterprise Association; Nathan S. Haseltine, Washington *Post and Times Herald*; Hiller Krieghbaum, New York University; Martin Mann, *Popular Science Monthly*; John Troan, Scripps-Howard Newspaper Alliance; and Earl Ubell, New York *Herald Tribune*.
    The board of directors, which is to take over direction of the CASW from the incorporators, is in process of completion. Among those elected so far are: Howard Allaway, editor of *Popular Science*; Paul Block, publisher of the Toledo *Blade*; Leonard Carmichael, secretary of the Smithsonian Institution; John R. Dunning, dean of engineering, Columbia University; Irving Gitlin, program executive, creative projects, Columbia Broadcasting System; Gerald Holton, professor of physics, Harvard University; Sidney S. Negus, professor of biochemistry, Medical College of Virginia; Irvine H. Page, Cleveland Clinic; W. Bradford Wiley, president, John A Wiley & Sons; Geiger, Krieghbaum, Troan, and Ubell.
12. This statement was quoted by L. R. Hafstad in a talk on science, technology, and society at the annual meeting of the AAAS, 1956.

Science in the News

Cut in Funds for Stanford Accelerator More Apparent than Real

Some confusion has accompanied the Joint Congressional Committee on Atomic Energy's refusal, for the second year in a row, to fully authorize construction of the giant Stanford electron accelerator. For, despite a fearful looking slash from the $107 million requested to the $3 million finally approved by the Joint Committee, the project will probably go through with no more than a negligible delay.

This single project will roughly double the government's program in support of research in high-energy physics, and the machine is only the first of several very expensive ultra-high-energy accelerators which will probably be started within the next few years as scientists probe deeper and deeper into the ultimate nature of matter.

The machine will be housed in a tunnel 2 miles long. A beam of electrons will be shot out of an electron source at one end of the tunnel with an initial energy of a few thousand electron volts. When they hit the target 2 miles away they will be traveling at speeds in the range of 99.99 percent of the speed of light, and will carry energies of 10 to 15 Bev (10 to 15,000,000,000 electron volts). The machine will be built so that it can be modified at some later date to

produce energies up to 45 Bev. It will be the most powerful, and the most expensive, atom smasher ever built.

A Presidential Decision

The amount of money involved in the Stanford machine is unprecedented for a single research tool, and as a result the decision to give the project the Administration's endorsement was made at the Presidential level rather than within the AEC. The proposal has undergone intensive review, and according to sources close to the President's Science Advisory Committee, of the scientists consulted, even those who at one time had reservations have become convinced that the Stanford machine should receive priority over other proposals for ultra-high-energy machines, and should be pushed despite the risk of unbalancing the government's program of support for high-energy physics by channeling so much money into a single project.

What has happened is this: After winning the endorsement of the President, the proposal was presented to the Joint Committee last summer. The Atomic Energy Commission asked for an authorization of $105 million to be spent over the 6 years it would take to build the machine, and the Joint Committee approved this by a virtually unanimous vote.

But between the time of the vote and the time the bill would have been sent to the House and Senate for final action a number of uncertainties arose, such as the question of an earthquake hazard. (Stanford is located within several miles of the San Andreas fault, and there was some question as to whether the proposed accelerator site did not actually cross the fault.)

Senator Clinton Anderson of New Mexico, the Joint Committee chairman, suggested to John McCone, chairman of the AEC, that the authorization should be put aside until this and other questions had been cleared up. McCone, by no means entirely unwillingly, agreed to this delay in authorization, which, it should be realized, did not necessarily imply a delay in the project as a whole, since such questions would have to be settled in any case before the project could move forward.

Indeed, the subsequent review led to a change in the proposed site (the matter of site is still not firmly settled) and to a major alteration in the construction method that will save about $20 million. This saving does not show up in the authorization request. It was more than covered by additional expenses that were found necessary.

As a result of all this, the Joint Committee today, justifiably or not, feels eminently satisfied that it was wise in refusing to go ahead with authorization of the full project last year. The AEC does not seem inclined to disagree.

This year, the AEC again asked the Joint Committee to approve the overall 6-year authorization, now up $2 million to $107 million. Last week the committee turned down the authorization, again on the ground that the plans and costs were not firm enough. Committee members raised the point, for example, that it was only after 100 or so test borings on last year's site that it was decided to shift the site. Yet only three test borings have been made on the current site, all of them at one end of the 2-mile area.

The committee takes the position that it is responsible for seeing that such projects are handled as efficiently as possible and that in order to assure continued and growing government support of such basic research projects, in the long run it is in the scientists' own best interests that projects be so handled. The position of the scientists, of course, is that if you insist on holding things up until you're absolutely sure everything is going to go smoothly, then you're probably just not going to get all the things done that should be done.

The scientists' side of the case was presented quite clearly by the committee itself in a unanimous report issued after a series of hearings held 2 years ago on the problems of basic research. The committee said then: "A major theme which emerged during the course of the hearings and inspection trips to field installations is the adverse effects which holdbacks of authorized funds have had on our physical research program in the various field installations where the actual research work is being carried out. These holdbacks have caused serious repercussions not only on the progress of our research projects themselves but have had the equally unfortunate effect of discouraging key scientists from remaining on the job."

Nevertheless, in this case, the committee has voted to give the Stanford project only $3 million for design and engineering instead of the full $107 million authorization. This apparently enormous cut, from $107 to $3 million, has led to speculation that the project will be delayed for a year or more, or even that the committee is thinking of scuttling the whole business. Actually, the cut is far more apparent than real, there is almost no one either on the committee or with the AEC who doubts that the Stanford group will get final committee approval after the first of the year, and it is questionable whether the project will have been delayed at all.

The Possibility of Delay

Although the committee refused to give final authorization, the situation has moved forward considerably since last year. The $107 million requested was to have been spent over the full 6-year period. The amount requested for the coming fiscal year, though, amounted to only $4.2 million. Roughly half of this was for design and engineering, the rest for preliminary construction.

It first appeared that the committee was cutting out the preliminary construction funds, which probably would have delayed the project at least 6 months. But even this cut finally became more apparent than real. For the committee and AEC agreed to a wording of the authorization that would allow the AEC, under the heading of design and engineering, to prepare detailed site layouts and drawings of the first buildings and even to solicit bids. In other words, the AEC seems to have a go-ahead to proceed exactly as if the construction funds had been authorized, on the assumption, or more accurately, in the hope, that when the AEC is ready to award contracts and start moving dirt, the committee will see that the money is made available.

Whether any time at all will be lost through the committee's action is uncertain, although it should be pointed out that no one is claiming that this is a crash program or that a few months' delay would be in any way critical. The committee has promised to take the matter up as soon as the new Congress meets next January. If no further hitches develop, final approval of the project should follow quite quickly.

If the project is ready to start construction, the only remaining hurdle will be that of getting the Cannon (Appropriations) Committee to report out a money bill. On the basis of past experience, the AEC is not hopeful that this would be done much before July. But the committee implies that it has been

working closely with the Cannon Committee and, even here, will be able to get unusually fast action if the project is ready to use the money. This remains to be seen.

Minority Opinions

After the nearly straight party-line 10 to 6 vote against the $107 million authorization, several of the Republicans on the committee were ready to offer privately some more flamboyant reasons than those suggested above for the committee's action.

The most widely published has been a suggestion that the Democrats are toying with the Stanford project to pressure the AEC into going along with the majority's plan to modify the huge Hanford, Washington, plutonium reactor to produce electricity for the federally owned Bonneville Power Administration (the TVA of the Northwest). But Senator Henry Jackson of Washington, leading proponent of this plan, is said to have worked out a private agreement with the AEC on this subject which is satisfactory to him, and even the minority member responsible for this story (an anti-public-power man) does not seem to particularly believe it.

Publicly, although the minority did file a dissenting report, they did not make a particularly strong case against the committee's action, and, in fact, toned down their report from earlier, more critical drafts. Nevertheless, one of the minority, probably Congressman van Zandt, will presumably make a *pro forma* attempt to add the full authorization to the bill by means of a floor amendment.

More realistically, although there is no clear indication that political factors affected the committee's decision, two such factors were present. First, there was some displeasure among the majority that the impetus for the project came from the White House, rather than from within the AEC. The position of the White House on this is that since an unprecedented amount of money is to go into building this machine, a national policy decision was required to decide whether such a project is advisable at this time. Related to this is the safe assumption that it has occurred to the statesmen on the committee that it might not be a bad idea for the final authorization to come in January, when there might be a Democratic administration available to take credit for this momentous project.

Finally, there remains the question of who or what will suffer as a result of the committee's action, and the principal answer seems to be the Stanford scientists. They have repeatedly made the point, more or less endorsed by the AEC, that they will have difficulty holding and adding to the staff of top men assembled at Stanford to run this project. What is more certain is that this delay will cause a considerable amount of anguish among the brilliant group at Stanford who have been working on the project for quite a few years.

The fact that there is 90-percent, even 99-percent, assurance that final authorization will come through next year may be enough to set the scientific community in general at ease. But unforeseen developments can develop. The Stanford group have been working in earnest on this project since 1957, and the planning group was first formally organized 2 years earlier. These men saw authorization slip away at the last minute last year, after it had apparently won approval. They would be considerably less (or more) than human if they were not thoroughly unhappy at the prospect of having to wait another 9 months for their baby to hatch.

United States Launches Two More Satellites

The United States has launched two more space vehicles—the Navy's Transit I-B, a "navigation" satellite that went into an elliptical orbit between 51 degrees north and 51 degrees south latitude on 13 April, and the Air Force's Discoverer XI, which was placed in polar orbit on 15 April.

Transit I-B

The Transit I-B—a 36-inch, 265-pound sphere—is the first of a series of satellites that are expected to revolutionize the present system of navigation. The Transit project is designed to develop a reliable means of fixing the position of surface craft, submarines, and aircraft more precisely than has heretofore been possible, and under any weather conditions at any hour of the day or night. The basic principle involved is the Doppler shift; the phenomenon is demonstrated when signals from a space vehicle vary in frequency in relation to the distance from a ground station. The first Transit satellite will probably stay aloft for approximately 16 months.

In 1962 four navigational satellites are expected to be traveling around the earth in evenly spaced orbits. By tuning in on the satellite signals with special receivers, ships of any nation will be able to establish their positions with precision never before attained.

Responsibility for the establishment of the new navigational system was assigned to the Navy Bureau of Weapons by the Advanced Research Projects Agency. The development of the system is being carried out for the Navy by the Applied Physics Laboratory of Johns Hopkins University, Silver Spring, Md., which originated the concepts on which the system is based. Commander W. L. Clark, USN, has responsibility for the Bureau of Naval Weapons, while R. B. Kershner of the Applied Physics Laboratory directs the technical program.

Discoverer XI

The 17-foot Discoverer satellite that was launched from Vandenberg Air Force Base, Calif., carried a 300-pound, bell-shaped instrument capsule that was to have been ejected and retrieved by planes trailing snares as it parachuted down toward the Pacific Ocean near Hawaii. The instrument package separated as scheduled but, because of a malfunction of the devices that were to have slowed it down, it has gone into orbit instead of descending.

This is the seventh Discoverer to be sent into polar orbit, the sixth time that recovery of the instrument packet has been planned, and the 18th United States earth satellite to be placed in orbit.

Leading Scientists Active in New Committee on Economics of Peace

Polykarp Kusch and Seymour E. Harris have been named cochairmen of a newly authorized special Committee on the Economics of Peace of the Democratic Advisory Council. Kusch, winner of the Nobel Prize in physics in 1955, is professor of physics at the Columbia Radiation Laboratory, Columbia University; Harris is Littauer professor of political economy and past chairman of the department of economics, Harvard University. Other committee members are: H. Bentley Glass, professor of biology, Johns Hopkins University; Richard A. Lester, professor of economics, Princeton University;