and for work in other fields which show scientific or technological promise"—and then goes on to cite "other fields" that are characterized mainly by technological promise: "applied mathematics, computing science, plasma physics, neutron beam techniques, enzyme chemistry, industrial biology, control systems and polymer and material sciences." It also notes plans to upgrade the 250-foot Jodrell Bank telescope and to begin work this year on a big telescope at Cambridge, though there will be a 2-year delay in starting construction of a 400-foot telescope at Jodrell Bank.

The only sour note in the report is reserved for the government's refusal for Britain to take part in construction of the 300-Gev accelerator planned by the European Organization for Nuclear Research (CERN) (*Science*, 23 August). And that note merits attention not because it is especially sour but because its very presence represents something that is relatively new, and still quite rare, in British science affairs: public disagreement between the government and its high-level science advisers. SRC chairman Brian H. Flowers, professor of physics at the University of Manchester, denounced the decision last spring, after officially presenting it to the CERN governing council. And now, in the SRC report, the subject is taken up again: "The Government's decision . . . is a severe blow to British high-energy physics; it has removed the center-piece of the Council's long-term plans for this most important field of fundamental research, and imperils the long-term survival of the subject in Europe. The Council will therefore continue to press for a reversal of the decision."

Why is Britain spending a substantial amount of money on basic research? Since leaders of American science are occasionally called upon to compose rationales for inquiring legislators, it may be worth a look at the SRC version, in which, conditions being what they are, considerable stress is placed on the utility of science. "The Council exists," states the SRC report, "primarily to enable good scientists and technologists in the universities and SRC establishments to do significant research. The Council confirmed [in a policy review] that this essential function aims to create cultural, scientific and technological assets through the training of highly skilled manpower and through the support of research which leads to the discovery of new knowledge and techniques. The assets so created are of value in their own right; they eventually permeate society as a whole; but they can only be generally seen to benefit the community after they have been applied to immediate aims by other organizations in industry, commerce and the public services. The Council will therefore continue to support both postgraduate training and research proposals of high quality over the broadest front. However, within each area of activity resources will be concentrated on schemes which seem most likely to yield significant scientific advance or the basis for economic or social benefit or both."

The SRC took note of the "swing from science"—the catch phrase for the drop-off in school-age science enrollments, and this was the subject of an all-day conference held here by the Royal Society on 24 October. In attendance were some 250 educators, scientists, and government officials, and among the speakers was F. S. Dainton, vice chancellor of the University of Nottingham, who pinpointed the "swing" in a major study made several years ago. The meeting produced no revelations but, rather, brought an assortment of views on the "swing."

As for causes, various speakers, including the headmasters of several schools that are experiencing the swing, cited poor teaching as the factor that most often chills early interest in scientific study. With students under pressure to compile records that will qualify them for university admission, the relative difficulty of the sciences, together with a dearth of qualified teachers, sends the students looking elsewhere. Several headmasters reported that it was far easier to recruit well-qualified teachers in the arts and humanities than in the sciences. Many agreed that a lot of school-level science teaching was dull and sterile, and that students really could not be blamed for turning their backs on it. Could the swing be attributed in part to a feeling that the physical sciences today create more problems than they solve? That charge is often made, but Dainton said he would not put too much stock in it; "too slick an explanation," he said. The causes, he and his colleagues agreed, are many, but most significant among them seems to be a lack of good teaching. The situation is one that feeds on itself: poor teaching leads to lower science enrollments, which produces fewer scientists, which results in fewer science teachers. It is the existence of this cycle, along with industry's presumed need for more scientists, that underlies the SRC's design to push more people out of university laboratories and into Britain's schools and factories.

—D. S. GREENBERG

The Draft: Graduate Schools and Students Are Still Worried

The sharp drop in graduate school enrollments feared by educators early this year did not materialize in many universities when classes opened in September. A decline had been anticipated because of the new Selective Service provisions under which students who started graduate degree programs after 1 July 1967 are no longer eligible for 2-S (student) deferments. Because the decline wasn't nearly as precipitous as had been expected, there was even an air of optimism among some university officials.

Any euphoria which may have prevailed, however, is evaporating as first- and second-year graduate students are beginning to receive their induction notices. For the students and the universities, it now looks as if things will get worse before they get better.

One reason why more graduate students haven't yet been taken is that draft calls have been relatively low in recent months; many of the monthly calls have averaged about 12,000 men. Even if the Vietnam peace talks are successful, the armed forces will still need a large number of replacements for those who will be leaving the services next year. It is anticipated that monthly draft calls will average about 25,000 men in the early part of next year and may further increase to 35,000 to

NEWS IN BRIEF

• **FULBRIGHT CUTS DEEPEN**: Cutbacks in the number of American students participating in the Fulbright program will be even greater than anticipated earlier (*Science*, 30 August). The Institute of International Education (IIE), which administers the Fulbright program for the government, says that postdoctoral research and the creative and performing arts will be hardest hit. There will be no Fulbright grants to the United Kingdom for Americans. All American student grants to Japan, Malaysia, and the Philippines have been eliminated; all teaching assistantships to India and Japan have also been withdrawn. There has been no change, however, in the number of U.S. travel grants to Eastern European countries. Final plans for Western European countries are still unclear.

• **MISSING**: A research plane being used by University of Wisconsin scientists to conduct atmospheric research over Lake Superior was reported missing on 23 October with a graduate student and two pilots aboard. The plane, which was on one of a long series of flights conducted to study the effect of heat contributions to the atmosphere by water surfaces in the Great Lakes region, customarily flew at an altitude of 1000 feet to take temperature measurements of the lake surface by infrared radiometry. The Coast Guard has reported sighting some debris, including a seat cushion, in the area, but no positive identifications have been made. The plane was supplied by the National Center for Atmospheric Research in a continuing National Science Foundation program to provide universities with research facilities.

• **PROFESSOR LBJ**: President Johnson says he is willing to be a visiting lecturer discussing national and international problems at colleges and universities after he leaves the White House next January. Johnson has received more than 40 invitations from academic institutions and has agreed to teach a series of seminars at Rice University next spring. He also plans to lecture in the future at the Lyndon Baines Johnson School of Public Affairs, at the University of Texas, and at Southwest Texas State College in San Marcos. Johnson is reported to have said that he does not want to meet any 8 o'clock classes.

40,000 men in the latter part of 1969. In the 1-A manpower pool, the oldest men are taken first; this will usually mean that graduate students and recent college graduates will be among the first to receive induction notices.

Betty Vetter, the executive director of the Scientific Manpower Commission in Washington, predicts that, while the percentage of college graduates among draftees was as low as 4 percent this past February, the percentage of college graduates among new draftees will have risen to 90 percent by next spring. She argues that the United States will have, without doubt, "the most highly educated military force in the world."

Appeals Being Exhausted

Other reasons for the failure to draft more graduate students in past months include the slowness of local draft boards in reclassifying students and the fact that many of those who have been reclassified have appealed, thereby slowing down the induction process. For many, the appeal channels have been exhausted, and in coming months these students will be prime targets for induction. Principal explanations for the failure of graduate-student enrollments to decline as had been anticipated include: (i) some graduate schools admitted more students than usual; (ii) many students enrolled in graduate school this autumn despite the knowledge that they are now eligible for the draft. "There have been a surprising number of gamblers," comments Mrs. Vetter, who is coordinating a nationwide study of graduate school enrollments in the natural sciences.

Some of these students were prompted to enroll by the knowledge that they would retain, at the conclusion of their military service, the federally financed scholarships (such as NSF fellowships) that have been awarded them. If they had not accepted these scholarships now, they would have had to compete again after returning from military service.

A large number of students enrolled because they felt they would at least be able to finish the term in which they started. This hope had been given substance when General Lewis B. Hershey, national director of the Selective Service System, met with educators in March. Although there is no legal provision that a graduate student must be allowed to finish the term in which he receives his induction notice, General Hershey told the educators that he would give consideration to the use of his limited postponement authority in individual cases where the facts clearly demonstrated the good faith of a registrant who receives his draft call in the middle of a semester. Mrs. Vetter estimates that, on the basis of Hershey's assurance, 90 percent of the men classified as 1-A enrolled in graduate school this past September with the idea that they would at least be able to finish the semester.

Nonetheless, according to educators who have tried to obtain such postponements for graduate students ordered to report for induction, General Hershey has not used his postponement power on behalf of graduate students called up in the early part of this academic year.

On 24 October, however, General Hershey issued an advisory memorandum to the state Selective Service directors saying that consideration should be given to the postponement of induction of graduate students until the end of the school term. This memorandum is not binding on state directors, but it does represent Hershey's first formal advice to the state directors that consideration be given such postponement.

Postponement

According to Mrs. Vetter, graduate students who receive induction notices and wish to finish the current term should write immediately to the state Selective Service director for the state in which they are registered, giving the date of the end of their school term and requesting postponement of induction until that time. The student should send a carbon copy of his request to his local board. If his request is denied by his state director, he can write immediately to General Lewis B. Hershey, National Director of the Selective Service System, 1724 F Street NW, Washington, D.C., requesting postponement. Such requests, however, will not necessarily assure postponement.

Some graduate students apparently still do not realize that there are no longer any 2-S deferments for graduate study, except in medicine, dentistry, veterinary medicine, osteopathy, and optometry. The abolition of this deferment poses a threat to many universities, not only because it may deprive them of many graduate students, but also because it will reduce their supply of teaching assistants. General Hershey made it clear last spring that a graduate student who worked part-time as a teaching assistant should not be consid-

ered for a 2-A (occupational) deferment. To be considered for deferment, graduate students must be teaching the number of hours considered normal for full-time faculty at their university.

The scientists and engineers who are probably most likely to be deferred are those working full-time in a vital industry, especially in defense work. Full-time teachers, especially if they are teaching in the community where their local board is located, also seem more likely to be deferred. It should be emphasized, however, that there is no "draft-proof" place for those who have finished their undergraduate work. Patterns vary widely from board to board and from state to state. For example, it seems exceptionally difficult to receive a 2-A occupational deferment in Texas or Colorado, and much easier to obtain one in the states on the East and West coasts, Mrs. Vetter says.

There is no doubt that graduate students are already being affected by the draft. Some winners of scholarships to study in foreign countries were not allowed to go abroad by their local boards; others have been called back from as far away as Argentina to report for induction.

One factor which complicates any analysis of nationwide trends in graduate school enrollments is the fact that the records kept by universities were not designed to reflect the impact of the draft on enrollments. This is especially true of past years; hence it is difficult to obtain accurate comparisons.

If students in the natural sciences and engineering are drafted at the same rate as students in the humanities and social sciences, it would be reasonable to expect that the former areas would suffer more from the draft. Mrs. Vetter explained that about 40 percent of graduate students in many disciplines of the humanities and social sciences are women; the corresponding figure is 25 percent in biology and 10 to 15 percent in most of the other natural sciences. The percentage of female graduate students is especially low in physics, and in engineering, where only about 2½ percent of the students are women.

One thing is certain: graduate schools and many graduate students are finding it difficult to deal with the uncertainty of the future. The graduate schools do not know how many students they must admit to keep their graduate programs in operation, nor can they tell with any precision how many of their teaching assistants and researchers will be drafted or when these inductions will take place. For the individual student, the ordeal is even worse. In the opinion of Vincent West, the associate dean of the graduate college at the University of Illinois, "it is really unbearable to have the kinds of uncertainty that plague these students for so many years."

It is obvious that, for the man who has finished his undergraduate work, the Selective Service System is becoming less selective and putting more emphasis on his obligation to do military service. "The Selective Service System grinds slowly but it grinds inevitably," one Washington official has commented. The system is beginning to grind faster now.—BRYCE NELSON

Guide for the Potential Draftee

In the experience of Betty Vetter, executive director of the Scientific Manpower Commission, adherence to the following recommendations will avoid many problems for Selective Service registrants, including scientists, engineers, teachers, undergraduates, and graduate students:

1) You should keep your local board currently informed of your address and of all facts which may affect your Selective Service classification.

2) You have 30 days from date of mailing of a new classification card to request a personal appearance before your local board. Following that appearance, a new classification card will be mailed to you. You may *appeal* this classification within 30 days of the date of mailing; or you may bypass the personal appearance and make an appeal within 30 days of the first classification card.

3) A man with scientific or technical training who is seeking an occupational deferment should have his employer request review by the state Scientific Advisory Committee on Scientists and Engineers in the area of employment. This request must be made at the time an appeal is placed or at some prior time.

4) If you do not live or work in the state where your local board is located, you may transfer appeal of your classification to the appeal board having jurisdiction over your present place of employment or residence. This request for transfer must be made in writing in the letter in which you request an appeal.

5) Your right to a personal appearance, to an appeal, or to transfer of jurisdiction of an appeal is forfeited if it is not used at the appropriate time.

6) All communication with your local board should be placed in writing. Telephone or personal conversations should be summarized on paper and sent to your local board for inclusion in your file. Keep copies of all communications with your local board. Send important documents by certified mail, return receipt requested.

7) Every Selective Service registrant is personally responsible for keeping himself informed of the rules and regulations of Selective Service, of his obligations, and of his rights.

Further detailed information for the Selective Service registrant is available from the Scientific Manpower Commission, 2101 Constitution Ave., N.W. Washington, D.C.

Three important publications available from this Commission are: (i) *'67 Draft Act* (regulations governing Selective Service classifications, deferment, and appeal). Single copies, 25 cents; $10 per 100. (ii) *Draft Facts for Graduates and Graduate Students.* Single copies, 50 cents; ten or more copies, 35 cents each. (iii) *New Draft Rules* (an explanation of the February 1968 ruling of the National Security Council in regard to occupational and graduate student deferments). Single copies, 50 cents; ten or more copies cost 35 cents each.

The Scientific Manpower Commission is a nonprofit corporation supported by 11 scientific associations. It is not affiliated with the U.S. government—BRYCE NELSON