have fallen below the minimum sustainable yield.

The other more specific conservation principle states that the quotas for each species in each general area (North Pacific, etc.) will be divided into six stock areas. In the past, Fox says, entire quotas set for species could be taken in small areas, devastating those stocks. Now the hunting must be distributed over six areas. The monitoring of this system, like the quota system in general, will fall mainly to each nation. After a general quota is set, the commission members meet and decide how many of each species may be taken by each nation in each area. Then each nation must subdivide its portion further among its private fleets. National and international inspectors travel aboard each whaling ship. "Our feeling," Fox says, "is that monitoring is definitely well handled."

The commission's 15 member nations are Argentina, Canada, France, Mexico, Panama, Britain, the United States (none of these nations engage in whaling), Australia, Brazil, Denmark, Iceland, Japan, Norway, South Africa and the Soviet Union. The commission was formed in 1946 to conserve whale stocks and thus keep the industry healthy, but not until 1963 were quotas imposed. It has since banned hunting of blue, humpback, right and gray whales.

The commission has come under considerable criticism for its timidity in regulating industry, but the agreement on the two general conservation principles, particularly by Japan and the Soviet Union, is seen as an encouraging change in attitude. Both sides seem more willing to compromise and work together, NOAA Administrator and chief meeting delegate Robert M. White says, since "it's finally dawned on the conservationists that the whaling fleets can't be scrapped just like that, and on the whalers that some species really are in danger of extinction." □

New push for uranium enrichment

To stem the outward rush of energy dollars, by increasing exports, the United States has only one real trump card—the high technology of uranium enrichment. Last week, President Ford took a major step toward greatly expanding America's enrichment capacity by requesting Congress to approve the transfer of this technology from the present, Government-owned installations to private, competitive ventures. He also promised potential customers that until the new private enrichment industry is on its feet, the Government will guarantee fulfillment of orders placed with private producers.

Many developing nations can now utilize—perhaps even build their own—nuclear reactors. Providing fuel for these reactors, however, is likely to remain the province of a few highly industrialized nations, for the foreseeable future. Naturally occurring uranium contains only 0.7 percent of the isotope U-235, while a concentration of at least 3.5 percent is needed to fuel a reactor. Since U-235 has the same chemical properties as other uranium isotopes, separation must usually be accomplished using the roughly one percent difference in their weight, a tedious and expensive procedure.

Traditionally, diffusion of gaseous uranium compounds through porous barriers has been the favorite technique, but a gaseous diffusion plant may cost $3 billion to $4 billion to build and requires 2.5 billion watts of electrical power to operate. Spinning the gases in a powerful centrifuge uses much less power, and smaller plants are economical, but commercial development has lagged. Laser separation is still in the research stage (SN: 6/7/75, p. 365).

A year ago, the three operating U.S. enrichment plants essentially closed their books to new orders; their capacity has now been booked up and they will be busy meeting domestic fuel requirements and existing foreign orders until the mid-1980's. To reopen the order books will require an enormous investment in new plants, a goal the President sees as desirable for at least two reasons: New orders for enriched uranium would ease the petroleum-burdened balance of payments, and only through participating in the international reactor fuel market can the United States help to shape the safeguards needed in a burgeoning nuclear economy.

Asked directly by SCIENCE NEWS whether the administration was hoping to forestall proliferation of uranium enrichment and reprocessing plants, Energy Research and Development Administration (ERSA) deputy administrator Robert Fri replied, "Yes, but I don't want to overdraw it." The Administration is worried about the recently negotiated sale of a complete uranium fuel cycle to Brazil by West Germany, and by offering a competitive reliable market for the processed fuel, Fri said, the United States can make such proliferation "much less likely."

By stimulating expansion of enrichment capacity through private means, rather than public, the President also hopes to capture much-needed foreign investment dollars. One consortium negotiating with the Government for permission to build an enrichment plant anticipates using as much as 60 percent foreign investment capital. Regardless of this percentage, however, the proposed legislation would require that domestic partners in any such ventures retain operating control of the plants and that the technology involved remain an American secret.

If the enabling legislation passes the Congress, three or four viable proposals for new enrichment plants are expected. Each proposal would be reviewed by the Joint Committee on Atomic Energy and "contingency liability" funds would have to be provided by the Congress. In case a company could not actually bring a proposed enrichment plant into operation, the Government would be able to step in and take over using these funds. If all works well, Fry estimates, the Government can hope to reap about $100 million a year through taxes and royalties from the new industry.

Not everyone is pleased with the new proposals. Opponents of nuclear energy maintain that increased fuel production will inevitably result in more domestic reactors—precluding further consideration of the issue. Others charge that producing nearly two or three times the nuclear fuel needed at home, while maintaining a proprietary control over the process, amounts to "technological imperialism."

The response to these arguments has usually been that nuclear power now costs 25 to 50 percent less than that produced by fossil fuels, which are decreasing in supply, and that if the United States does not exploit its early lead in the nuclear technology, other nations will take the initiative. These and the other basic assumptions of alternative energy futures are likely to be hotly debated later this year as Congress moves toward a new confrontation on nuclear energy in all its aspects. □

Medal of Science

Saying that an examination of the winners' accomplishments "demonstrates the importance of science and engineering to the nation," President Ford last week announced the names of the 13 winners of the National Medal of Science. The winners were selected from 204 nominations by the National Academy of Sciences, various professional societies and various colleges and universities. The medal is considered the nation's highest award in science, mathematics and engineering. The winners are:

NICHOLAAS BLOEMBERGEN, applied physics, Harvard
BRITTON CHANCE, biophysics, Univ. of Pennsylvania
ERWIN CHARGAFF, biochemistry, Columbia
PAUL J. FLORY, chemistry, Stanford
WILLIAM A. FOWLER, physics, California Institute of Technology
KURT GÖDEL, mathematics, Institute for Advanced Study, Princeton
RUDOLPH KOMPFNER, electronics, Bell Labs
JAMES VAN GUNDIA NEEL, genetics, Univ. of Michigan
LINUS PAULING, chemistry, Stanford
RALPH B. PECK, civil engineering, private consultant, Albuquerque, N.M.
KENNETH S. PITZER, chemistry, Univ. of California, Berkeley
JAMES A. SHANNON, biomedicine, Rockefeller University.
ABEL WOLMAN, sanitary engineering, Johns Hopkins □