



Projected U.S. mineral consumption.

existing technology. New techniques are being developed with coal (SN: 7/26, p. 84), but not enough to suit some people. Dr. Martin A. Elliott of Texas Eastern Transmission Corp., Houston, Tex., advocates better utilization of the nation's tremendous coal reserves. He points out that the Government spends far more on developing atomic energy than it does for developing gasification and liquefaction techniques to convert coal to natural gas and to oil. And the same holds true for techniques for getting oil from oil shale and electricity from burning coal through magnetohydrodynamics.

"These processes are going to be needed; as good ideas come along, they should be studied," urges Dr. Elliott, who was on the fuel science and technology panel. "What is really needed is more basic research in these areas."

If coal utilization is suffering from a lack of basic research, the area of nonmetallic materials, which includes ceramics, cement, graphite, nuclear fuels and semiconductor materials, is crying out for more applied research. The panel sees the failure of researchers to develop new synthetic inorganic materials to do a specific job as the reason why the country does not have better semiconductors, construction materials or heat- and oxidation-resistant materials. One major reason for this is the failure of inorganic chemistry to be joined with other branches of materials science and engineering to form an interdisciplinary effort.

By way of illustration, Prof. H. C. Gatos of the Massachusetts Institute of Technology has pointed out that, "The classical inorganic chemistry, which is fading in this country, has found in the U.S.S.R. new fertile soil in electronic materials and particularly in semiconductor compounds."

Another reason, says Prof. Alfred Allen of the University of Illinois, is that

	1963	1964	1965	1966	1967
Vacancies	22	25	50	95	153
Job offers	30	29	83	140	201
Engineers Hired	13	19	39	50	56
Offers/Vacancies	136%	116%	166%	147%	131%
Hirings/Vacancies	59%	76%	78%	53%	37%
Demand Index: Vacancies per Company	2.4	2.8	4.3	5.1	5.9

Charts: National Academy of Sciences
Mining engineers in short supply.

the limited financial return from some nonmetallic materials means restricted research budgets. Citing the fact that refractory brick can be bought for as little as 15 cents, he says, "The value of the product doesn't allow for a large percentage of the sales to be spent on research."

As indicated by Prof. Gatos, the lagging mineral technology here has enabled other nations to move up on the United States. In extractive metallurgy, the recovery of metals from ore or waste, United States industry has produced few new extractive processes when compared with England, Russia, Japan and Australia.

"We're not hurting too badly at the moment," says Dr. Herbert Kellogg of Columbia University. "We're neglecting the low grade and complex ores. I think we'll be hurting in 10 years," he adds.

The same is true of mining, where the innovations come from Sweden (controlled blasting), Germany (improved drills), South Africa (shaft sinking) and Australia (rock reinforcement), to name a few.

Despite different needs for the various areas of mineral science and technology, whether mining, extractive metallurgy or fuels, one common ailment is the lack of scientists and engineers. Some 35 percent of the mining schools have closed since World War II, and since 1959 the number of B.S. degrees in mineral science and technology has shown a downward trend, as students are discouraged by rising tuitions in out-of-state colleges and attracted to more glamorous fields.

"We've got 10 jobs for every student," complains Prof. Allen. "We need students."

Recommendations have been made by the committee ranging from more Federal funding, to Governmental reorganization to joint industry and university educational programs.

Future of a subcommittee

For much of the decade of the 1960's, a major spokesman for science on Capitol Hill was Rep. Emilio Q. Daddario (D-Conn.). Through his Subcommittee on Science, Research and Development he publicized the importance of basic science and made a place for it in Congressional deliberations.

Now that Daddario is leaving (SN: 2/21, p. 196), the future of his podium is in question. And although the chairman of the parent House Science and Astronautics Committee, Rep. George P. Miller (D-Calif.), says he has not decided yet who will replace him, the subcommittee will probably be considerably altered by next year no matter who the chairman is.

If Miller selected a replacement for the retiring chairman strictly on the basis of seniority, he would choose Rep. John W. Davis (D-Ga.). Davis is known as a close follower of scientific developments, though not as an initiator of policy. But he is already chairman of a Science and Astronautics subcommittee on the National Bureau of Standards, and Miller says he plans to sound out several candidates "to get their feelings on some issues I think are important."

In any case the work Daddario started may be outgrowing the subcommittee he put on the map. Because of the phasing out of some subcommittees on space, and of the increasing emphasis on technology assessment (SN: 3/7, p. 241), says a committee staff member, "The work of the Daddario subcommittee becomes more crucial to the whole technical picture. What's going to happen is that there will be a reappraisal of the whole situation by the first of next year." Three separate committees might be spun off to handle the expanded workload—and to create chairs for senior Congressmen now heading dying space subcommittees—he speculates. One new subcommittee would be devoted exclusively to technology assessment, another to overseeing the National Science Foundation and a third to the general area of science policy.

In the last decade, under Daddario's leadership, the Subcommittee on Science, Research and Development has probed a wide range of science policy issues. Daddario was a strong force in creating a science policy office within the Library of Congress. He opened up debate on centralizing science in Government agencies and was one of the first to question the defects in the way Government supports science in the universities. His subcommittee revamped the charter of the National

Science Foundation to leave the Foundation better attuned to the needs of both science and society. And the present public interest in technology assessment is to a large degree a product of the subcommittee's efforts.

Much of this achievement is attributed to Daddario personally. Dr. Philip Handler, president of the National Academy of Sciences, traces the origin of the phrase "technology assessment" directly to Daddario, and calls him "the first real Congressional student of science policy since the exercise that led to the creation of the National Science Foundation." The Daddario

subcommittee's two reports on technology assessment, Dr. Handler says, were a pleasant surprise to scientists who doubted that such studies were even possible. "But through Daddario," he states, "they came to feel that these studies are not only feasible, but imperative."

Daddario hopes to leave behind a well-worked-out system of understanding science policy matters on Capitol Hill. He will soon introduce legislation to establish a special committee in Congress to alert the traditional committees to technical problems affecting their jurisdictions. □

MOUSE ERUPTION

Unexplained Australian plague

Australia, which has had its trouble in the past with rabbits, now is suffering from an outbreak of mice. In recent weeks, great numbers of mice have been spreading through northwestern Victoria. The rodents have been eating crops, obstructing highway traffic, entering private homes and public institutions and otherwise generally making a nuisance of themselves.

At Ouyen the mice attacked the wheat stubble to such an extent that farmers had to feed their sheep by hand. The Ouyen Hospital placed tin cans around the legs of the patients' beds after a 24-year-old woman was bitten while asleep. At Hopetown people coming back from holidays were finding mice crawling in their beds. At Sea Lake the mice were like a moving carpet in some areas, infesting grape orchards and gardens. On occasion cars had to reduce their speed to 20 miles an hour.

The Victoria Department of Agriculture is unable to provide an estimate of crop damage, but the Australia Museum in Sidney estimates a 20 percent damage to rice, maize and sorghum. It estimates the mouse density at greater than 200 per acre.

This week a farmer at Smithville reported that 29,000 mice killed by poisoning had been picked up on his property in a two-day period. Other farmers in the region were measuring their kills by the number of 44-gallon drums filled.

Rodent specialists in the United States are curious and puzzled. The outbreak calls to mind the Appalachian squirrel eruption in the fall of 1968, when an estimated 20 million gray squirrels left their home territories and moved in all directions in a desperate search for mast (SN: 10/12/68, p. 359). But a mammal ecologist who has published a study of that event, Dr. Vagn Flyger of the University of

Maryland's Institute of Natural Resources, says that the Victorian mouse outbreak seems to be much more intense.

"I just don't have any idea what could be the cause of such a thing," he says. "The squirrel migration wasn't anything compared to this mouse plague."

The squirrel migration was triggered by a poor crop of acorns in the Appalachian region in 1968. The squirrels were well fed and had no immediate food shortage. But in the fall they search for acorns to store for the winter. When they didn't find enough to keep themselves occupied they moved on to other areas, sometimes with suicidal purposefulness.

Dr. Frank A. Pitelka, a research ecologist in the Museum of Vertebrate Zoology at the University of California at Berkeley, is also mystified by the mouse outbreak. "These sporadic outbreaks are often associated with the effects of man's activities," he says, "There must have been a good sequence of weather and crop production."

What puzzles him is that the rodents most commonly subject to population eruptions, such as the lemming, an Arctic mouse, belong to the rodent subfamily Microtinae, animals characterized by continually growing teeth—an adaptive trait giving them an advantage over animals whose teeth gradually wear down. But the microtines are confined to the Northern Hemisphere.

The common house mouse, however, which has spread throughout the world, is known for its prolific tendencies. In a mouse plague in the Central Valley of California in 1926-27, a population of more than 82,000 per acre was estimated. The mice worked the sparsely vegetated soil until it appeared to be cultivated. Millions of them swarmed through the area until the population trend was reversed. □

OIL SPILL

Precautions and liability

This month's oil spill off the coast of Louisiana (SN: 3/14, p. 263) still has a potential for being one of the worst in history. A change in the wind at midweek increased the fear the oil may get ashore where it can kill waterfowl. Meanwhile Interior Secretary Walter Hickel sternly told the Chevron Oil Co., owner of the wells involved, that the spill could have been avoided and that the company will bear full liability.

Even if the oil does little local damage, scientists are now concerned about more subtle and widespread oil pollution effects. A Federal Water Pollution Control Administration team was preparing to look at these in connection with the 600- to 1,000-barrel-a-day Louisiana spill. The spill began March 10 after a fire atop a drilling platform was blown out with a dynamite blast.

While the Louisiana disaster had the limelight this week, a Senate-House conference committee staff worked on a final report which would assign liability to the source of a spill whether or not negligence was involved. The legislation would also establish a \$35 million revolving fund to enable FWPCA to move in quickly to clean up a spill. □

NEWSBRIEFS

Visible comet; space funds

A visible comet, named Bennett after its Australian discoverer, will become prominent in the last days of March as it recedes from the sun. It is the year's second visible comet (SN: 3/7, p. 241). According to Dr. Tobias C. Owen, a visiting professor at California Institute of Technology, Bennett should be visible about an hour or more before sunrise. Its maximum predicted magnitude is 1.5, equal to some of the brightest stars. By early April it will rise three hours before the sun, but will have faded to second magnitude. It is now moving north through Aquarius toward Pegasus. □

Manned flight has received less emphasis in Administration planning after the moon program (SN: 3/14, p. 264), but the House Science and Astronautics Committee is resisting the trend. It voted last week to authorize \$3.6 billion for the National Aeronautics and Space Administration, \$300 million more than requested. Included is \$45 million for two more Apollo flights, \$100 million for suspended Saturn 5 production, \$75 million for another orbiting workshop and \$80 million more for the space shuttle and space station. □