of NIH for 13 years, put it this way: "In the Yarborough report, they talk of expenditure as an end in itself rather than a derivative of substantive proposals. If they got the funding they want," Shannon said in an interview with *Science*, "the cancer effort would represent 40 percent of the American biomedical effort. And the facilities and manpower just aren't available."

Shannon, who often opposed Mrs. Lasker in matters of basic versus applied research, agrees with the Administration's appraisal that it would be unwise to take cancer research out of NIH. "It would strip a broad and complex area of science away from contiguous areas. This," he declared, "would be bad for cancer research, and it would be bad for science."

Despite his opposition to the cancer authority idea, opposition that the Laskerites would put off as the predictable response of an ex-NIH bureaucrat, Shannon agrees with many of the ideas expressed in the Yarborough report. Shannon said that both the Yarborough and the Nixon reports have good elements. "Both," he said, "recognize the need for a broad scientific base as well as medical payoffs. Both establish priorities. And both would result in an increase in funds for research."

In addition, Shannon favors a vast increase in contracted cancer research. Alluding to the example of NASA's efforts to build a powerful rocket (where work was simultaneously carried out with solid, liquid, and nuclear fuels), Shannon indicated that contracts in biomedical research should be let along parallel lines for the same problem. "In the past," he said, "only one theory at a time has been tested. And this is one reason why contractual research in biology has such a bad reputation."

For something as diffuse as cancer research, the questions of what forms of support for science and what manner of organization of research will bring results can only be answered after the results are in hand. With or without their National Cancer Authority, the Laskerites have brought about major changes in cancer research including an increase in funding. This they did through the subterranean channels of politics so often shunned by scientists. And even if the scientists criticize Mary Lasker's sledge-hammer approach to the subtleties of basic versus applied research, they must face the fact that she gets them more money and the possibility that her schemes might be the right ones.

—ROBERT J. BAZELL

# Science Junk: Funding Cuts Make Used Equipment Pile Up

Six IBM memory cores belonging to a 7032 computer sit unused in a General Services Administration (GSA) warehouse in San Francisco. At nearby Hunter's Point, the Navy Department has decided that it has no use for a $6 million cyclotron whole—and therefore it will be "cannibalized" and takers found for the pieces. Among the thousands of excess property items listed every month by the Columbus, Ohio, Defense Surplus Sales Office, is a 4000-pound bundle of brackets, bristles, cables, converters, energizers, and meters. Their condition: Unused. Their original price at time of acquisition: $139,939.

Idled scientists have received a great deal of publicity lately; but little has been said about the fate of their unemployed equipment. The fact is that federal cutbacks in basic research and the space program in recent years, and the wind-down of the Vietnam war, are causing the volume of used scientific and technical equipment to swell.

The volume of "excess" scientific equipment traded within government facilities and passed on to the commercial market or scrapped can only be guessed. Government property officers do not usually separate items by categories, such as scientific equipment. But the total quantity is enormous. In fiscal 1970, the Department of Defense (DOD) declared $7.3 billion worth of goods as excess; and the GSA similarly processed $3.3 billion worth of civilian items.* Other federal agencies traded upward of $500 million, making the total close to $11 billion! This is an increase of more than $2 billion since 1968, which observers say is due to the slowdown in Vietnam and to overall federal cutbacks. The portion of these totals that represents scientific equipment has swollen too, they say, as a result of tight funds.

There is a formal, bureaucratic network through which anyone receiving funds from the government can get goods, virtually free, from any other part of government. Officially, the system is meant to promote economy as well as a kind of equality-before-the-supply-officer among needy bidders.

But, in the special case of scientific equipment, scientists often prefer their own personal grapevines among colleagues and key property officials to get an inside track on what is coming onto the market—as well as to make advance agreements to get things for themselves.

In fact, there is some question whether the federal disposal system promotes the economies it should. The percentage of excess property actually redistributed is fairly low, and when goods are sold, the government gets only an estimated 3 to 5 cents on the acquisition dollar.

It is hard to be frugal about used scientific equipment, since much of it has no secondhand use. Nonetheless, many scientists complain that the federal disposal system doesn't meet their needs. Even now, when pennies count more than ever, many scientists eligible for free property through the system are shunning it and buying used items from commercial dealers instead.

On the other hand, federal property officers trying to promote economies feel frustrated by some scientists who hoard their equipment—in some cases even hiding it—rather than share with each other. Other scientists, they say, fail to see that hard times are here and insist "on a brand new shovel every time they dig a ditch."

Certainly this secondhand goods market produces some bizarre transactions. Scrapped weapons were used

* These figures represent the original cost, or the acquisition value, and do not indicate depreciation nor condition of goods. The GSA also screened $1.4 billion of goods from DOD, making its overall fiscal 1970 total $4.7 billion.

# NEWS IN BRIEF

• **GERMAN PEACE RESEARCH:** The German Society for Peace and Conflict Research (Friedens und Konflikt Forschung) officially came into being last October in Bonn. Established largely through the efforts of West German President Gustav Heinemann, the Society is part of the Federal Ministry for Science and Education. Its 1971 budget is about $800,000, to be increased ultimately to about $2.2 million. The society, whose founding members include representatives from religious, labor, and industrial organizations, will look into the causes of war, coordinate current projects related to the problem, and further concrete planning for peace. The society's scientific council will be selected under the guidance of Carl Friedrich von Weizsäcker, a prominent peace researcher who heads the Max Planck Institute for Research into the Conditions of Modern Living.

• **GM GETS ENVIRONMENT PANEL:** General Motors Corporation, which has been a prime target of criticism from public interest groups, has set up a committee of six scientists to advise it on the environmental implications of its research, products, and operations. The group will be headed by Berkeley physics professor Charles H. Townes. The other members are Raymond F. Baddour of the Massachusetts Institute of Technology; former Presidential Science Adviser Lee A. DuBridge; Martin Goland, president of Southwest Research Institute; Robert S. Morison of Cornell University; and Robert L. Sproull, president of the University of Rochester.

• **EVOLVING PUBLICATIONS:** *Transactions of the New York Academy of Sciences* has announced that it will no longer confine itself to publication of papers presented within the Academy, but will henceforth be "one of the very few truly interdisciplinary scientific journals in the nation." Papers are now solicited from the entire scientific community. The journal will also run a "Comments" column, which will contain letters of general scientific interest and serve as a forum for discussion between readers and authors of published papers. *Transactions* comes out eight times a year. Subscriptions are $20 a year.

to advance the education of a Boston student and inventor named Russell Seitz, who collected them for their metals, from which he made a variety of things, including thermometers. He subsequently made a splash in the local press by announcing that he had a complete guidance system, a set of Titan engines, and everything else necessary to build a complete intercontinental ballistic missile in his basement!

### The Federal Disposal System

The two principal agents in the government system for disposing of property are GSA, official manager of government property and records, and the DOD, the largest federal consumer of everything from weapons systems to thumb tacks.

The system is based on a series of screenings down a ladder of eligibility from the original user to the public. If a division within a federal agency (or a research contractor) finds no use for an item, it is declared excess to the division. Then the agency tries to find takers for the goods somewhere within its walls. If no inside takers are found, the agency declares the goods excess to itself and files the items with GSA, which in turn tries to find takers within the government. If none are found, GSA declares the goods surplus to the government, and they may be offered, under a 1949 law, to hospitals, educational institutions, civil defense installations, and airports, for free; or they may be sold to commercial junk dealers and anyone else interested.†

The key to the system is the list—and who gets it. Officially, the GSA lists are available to anyone. An agency's in-house lists are public to anyone on a grant or contract with the agency. But, in fact, both kinds of lists receive very limited circulation, going mostly to the chief of supply in certain installations, and a selected group of grantees and contractees, chosen through rather vague criteria.

Most agencies concerned with scientific research have special programs for passing title of equipment to the contracting institution or to a needy university instead of reporting it as excess to GSA. Some of these special programs are getting more used items now that more contracts are terminating. But in some agencies more equipment is being reused or used longer—draining the special programs of their supplies.

►By law, GSA processes all goods declared excess by any government agency. But, because they are the prime source of them, DOD has a special arrangement whereby, after notifying GSA, it disposes of its own property. Anyone may bid on the DOD items—even a noncitizen. The lists come from 21 different regional offices. The lists include not only all sorts of used military paraphernalia, but also electronic, general laboratory, medical, and dental equipment. There is also a special list of the more valuable, sophisticated, and often unused equipment put out by the Defense Logistics Services Center at Battle Creek, Michigan.‡

Many useful items, however, never reach the excess lists. In a special study, the General Accounting Office (GAO) made inspection tours of five DOD science laboratories. It identified an average of 1.6 percent of the equipment as undeclared excess. The GAO also found no special audit procedures or equipment pools that would help identify and share items within the laboratories. The GAO estimated that, at the time, total equipment in all DOD science laboratories was worth $1 billion, implying that 1.6 percent, or $16 million might be undeclared excess.§ DOD says that sales of used property bring 3 to 5 cents on the acquisition dollar. But even after transfers and sales, the department had $3 billion in goods left over last year!

► In the present economic climate at the Atomic Energy Commission (AEC), one officer says, "When anything is out of use or operation, the rest of the people are like vultures." Vigorous recycling among the AEC's 20-odd laboratories promotes economy—but it is also draining its education program of the stocks of used equipment that universities used to get.‖

One problem that the AEC faces is the wasteful "cannibalization" of complicated nuclear equipment. A nuclear reactor in Sandia, New Mexico, was advertised by GSA as excess and claimed by the National Bureau of Standards, which wanted only a cranelike fueling bridge that came with it. The Division

† Sales are handled through ten regional GSA Sales Offices in Boston, New York, Washington, D.C., Atlanta, Chicago, Kansas City, Missouri, Fort Worth, Denver, San Francisco (including Hawaii), and Auburn, Washington (including Alaska).

‡ For further information write Defense Logistic Service Center, Directorate of Utilization, Battle Creek, Mich. 49016.

§ "Need for Improved Laboratory Equipment Management Procedures: Department of Defense" B-160140. Issued 24 November 1970 by U.S. General Accounting Office, Washington, D.C. 20548.

‖ For further information write Director, Nuclear Engineering and Training, U.S. Atomic Energy Commission, Washington, D.C. 20545.

of Nuclear Education and Training in AEC managed to rescue the almost-dismembered reactor when the Louisiana State University offered to take it intact.

AEC will close down the Princeton-Pennsylvania Accelerator on the Forrestal campus at Princeton on 30 June 1971. Movable items (shielding blocks, magnets, and power supplies) are going to other AEC projects. Such surpluses as reels of cable have gone to a government storehouse in Belle Meade, New Jersey. But the building and accelerator themselves, says Milton G. White, the director, amount to "just a white elephant." They will be turned over to Princeton.

A case of equipment in limbo is the AEC's Cambridge Electron Accelerator (CEA), used by Harvard, M.I.T., Tufts, and other schools in the Boston area. CEA's budget was cut by 30 percent to $2.35 million in fiscal 1971. Its executive committee decided to focus on colliding-beam work and to cut out unrelated experiments by other user groups. But the committee also made a policy decision to maintain a capability for going back to its former variety of physics research projects. According to C. W. Woodredge, who is assistant to the director, these decisions have minimized staff shrinkage to a present level of 115, including 12 Ph.D.'s. But about a dozen high-powered magnets, some originally valued at $100,000, are standing around on a "partly used" status—awaiting more prosperous times.

► The National Science Foundation (NSF) has one of the most active programs for moving used equipment into the hands of scientists. For example, it arranged for a team at Pennsylvania State University on a small meteorological grant to receive an Army M33 radar unit, worth $478,000, to track wind currents. From 1961 to 1970, NSF's property program rose from a meager $500,000 to $49 million. The Project Property Section aids the potential recipient by making available relevant lists, screens some lists on his behalf, simplifies his paperwork, and arranges for title to the property to pass to him as soon as NSF is notified of the property's delivery. ¶

NSF also tries to rescue items from the GSA system and find homes for them. Junk dealers wanted to pay $5000 for the San Francisco computer memory cores valued at $5 million, a spokesman said, but NSF arranged for them to go to the University of Oregon for the cost of transport only.

► NIH handled $3 million in excess and used property last year, and recycled about half of it. Some medical equipment becomes outdated very fast. Thus, centrifuges that are a few years old have a market value of zero; meanwhile NIH is buying new ultracentrifuges that cost up to $45,000 for its contractors.

NIH is running a cleanup campaign to dispose of excess property. To encourage physicians' interest at their Bethesda warehouse, a blond mannequin is on duty at the door, promoting used sterilizers, iron lungs, isolation units, and furniture.** NIH made $915 last year by selling to a commercial dealer the silver residue that collects on x-ray films. Another economy is collecting and selling old IBM cards. Last year 99,870 pounds were sold to paper processers.

► Major switches among programs are the chief factors that cause NASA's excess property volume to swell. Total excess among NASA's nine major installations, and reported to GSA, peaked in 1968 when the equipment-laden Gemini program was finally phased out, even though the overall NASA budget was higher than it is now. Unlike centrifuges and reactors, used Gemini capsules and rockets have a symbolic value—hence a secondhand market. "Everybody wants a rocket for their park," says a spokesman, "just as after the war everybody wanted a tank."

To convert or not is the unanswered question causing some NASA equipment to be gathering dust at the site of its former Cambridge Electronics Research Center. NASA closed the Center on 30 June 1970, and it was taken over by the Department of Transportation (DOT). NASA could not simply pull out its $28 million investment in equipment and move it

¶ For further information write to Paul Ashby, Property Officer, National Science Foundation, Washington, D.C. 20550.

** For further information write Property Utilization, Supply Management Branch, National Institutes of Health, 9000 Rockville Pike, Bethesda, Md. 20014.

# Open University Is Born

The Union for Experimenting Colleges and Universities at Antioch College has announced the start of an unconventional program in higher education, University Without Walls (UWW), which is designed to make college-level education more flexible and available to persons of all ages from 16 to 60 and over. Nineteen colleges and universities are participating. *

Each UWW student will be assigned a "teacher-adviser" who will help him work out a learning program tailored to his needs. In addition to classroom work, students will engage in independent study, fieldwork, and part-time jobs. The program will make extensive use of an "adjunct faculty" of outside professionals in business, science, government, and the arts.

In essence, UWW represents an attempt to promote education as a cradle-to-grave process uncircumscribed by time or space. Each of the participating institutions will have its own UWW program (most starting next fall with about 75 students apiece), but students will be able to take part in and use the resources of other UWW programs. The Union, headed by Samuel Baskin of Antioch College, has received $400,000 from the Ford Foundation, supplemented by $415,000 from the Office of Education, for planning and developing the program. The projected yearly tuition is $2650.

UWW is one of four innovative higher education projects that have received a total of $2.5 million from Ford and the Carnegie Corporation. The others are a state-run program of "external degrees" in New York; a new, nonresidential college of the State University of New York; and a study of the idea of the external degree, to be conducted by the Syracuse University Research Corporation.—C.H.

* They are: Antioch, Bard, Chicago State, Friends World, Goddard, Loretto Heights, Morgan State, Northeastern Illinois State, Roger Williams, Skidmore, Staten Island Community, and Stephens colleges; New College (Sarasota, Fla.); universities of Massachusetts, Minnesota, and South Carolina; and Howard, New York, and Shaw universities.

## News Staff Additions

The *Science* news staff has two new members. Robert Gillette, a 1966 graduate of the University of California, Berkeley, worked as a science writer for the Toledo *Blade* and most recently for the San Francisco *Examiner*. Deborah Shapley, a 1967 graduate of Radcliffe, worked as a reporter for the Quincy *Patriot Ledger* in Massachusetts and came to *Science* from a job as an associate editor of *Technology Review* published at M.I.T.

elsewhere for its own uses—since DOT might want some. To date only $7 million of the equipment has gone elsewhere in NASA. Some is used by DOT; much of it is unspoken for.

#### Scientists Prefer to Buy

It is quite possible that these agencies transfer far less property than they could. Last year, GSA passed to other agencies only 13 percent, or $636 million, of the goods it screened. A main reason for the low rate of transfer is that the relevant lists, while technically public, only rarely reach the men in the laboratories who are most aware of what they need. NIH and AEC give their own and GSA's lists limited circulation; they transfer relatively little used property. Researchers on federal grants have complained that the lists are prized items, carefully guarded by those privileged to get them.

One scientist cites "shocking" examples of unused government-owned equipment. "I have been conducted through large government laboratories," he says, "where there were rooms full of new, unused equipment, set up to work, and my guide asked me, casually, 'Do you have an experiment you could do here? We don't have anybody to run these things since we're short on manpower.' "

A physician, who has overseen the management of equipment in private industry for 13 years and now does the same at a small ($2.2 million annually) university laboratory funded by the Air Force, says that in 7 years he has bought only one piece of government excess equipment which "did me any good."

He notes that the system of request and counter-offer, whereby a scientist specifies exactly what he wants, and the program supply director, possessing the precious lists, counters with approximately the same thing, does not work well. "In most cases the instruments they offer are not the same. Make and model numbers are often different. It's not worth it to me to replace my 7-year-old oscilloscope which is finally worn out, with a 6-year-old one whose useful life will end in 1 year!"

Moreover, he says, inspecting an instrument at a local government warehouse—the method by which the government tries to assure the researcher that he gets what he wants—is an inadequate way to see whether a bit of complicated machinery really works. "My experience has been that the government equipment doesn't work when it comes in," he says. Unable to order new things because of funds, he prefers to buy from commerical dealers specializing in science junk, whose prices are low and whose equipment at least comes guaranteed.

And commercial dealers can make money by selective bidding on the tremendous volume of goods that the government is discarding. The government can at will reject bids it deems too low on a valuable item and sell at a later time. But now, pressure is mounting to move equipment along. This gives the dealers an advantage; they usually bid on valuable items only if they can line up buyers who will give them their preferred 2 to 1 on their investment.

Electronics, for example, was a "hot item" on this market 5 years ago. But today the electronics market has become glutted, says one NASA property officer. But dealers from as far away as the West Coast are bidding on other items sold at a special GSA office recently opened at NASA's Cape Kennedy installation. And, if they are bidding, they must have some buyers somewhere.

But to make the federal disposal system truly promote economy in government requires not only improved federal management but cooperation from the scientists. One federal property officer finds some types of scientists unhelpful. Many, he says, always insist on brand new equipment, even "to dig a ditch." But some "only put an item on an excess list, literally, if they happen to stumble over it a few times in their laboratory." He says there is also the "pack rat—the guy who never wants to get rid of anything. If he sees something on an excess list, he'll take it, regardless of whether he needs it. This can be very expensive.

"Some scientists literally hide items. I'm not exaggerating. They hide things from their colleagues! If the guy across the hall needs it he'll tell him to go buy his own. He forgets that the federal funds paid for it. He gets personal and possesive about it. But that's good too because these people usually take very good care of their equipment. So what should the government do?"

—DEBORAH SHAPLEY

## RECENT DEATHS

**Max Beberman**, 45; former professor of mathematics, University of Illinois; 24 January.

**Fitzhugh W. Boggs**, 59; professor of research engineering, Pennsylvania State University; 16 January.

**Dwight L. Clark**, 44; professor of dentistry, University of North Carolina; 15 January.

**Edwin J. Dealy**, 67; chief, anesthesiology division, Veterans Administration Hospital, Washington, D.C.; 23 January.

**Ralph J. DeFalco**, 64; professor of zoology, Rutgers University; 24 January.

**James B. Mead**, 37; research physicist, Naval Research Laboratories, Washington, D.C.; 11 January.

**Henry E. Meleney**, 83; former professor of preventive medicine, New York University; 30 December.

**Leo Oliner**, 45; professor of medicine, George Washington University; 8 December.

**Federico J. Prohaska**, 56; chairman, geography department, University of Wisconsin, Milwaukee; 22 December.

**Alexander G. Ruthven**, 88; retired president, University of Michigan; 19 January.

**Joseph B. Sprowls, Jr.**, 58; dean, College of Pharmacy, University of Texas; 10 January.

**William K. Squires**, 43; former professor of electrical engineering, University of Buffalo; 9 January.

**Herbert M. Stauffer**, 56; chairman, radiology department, Temple University; 18 December.

**Ruth Strang**, 75; professor emeritus of education, Teachers College, Columbia University; 3 January.