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THE GAO REVIEW

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1834 engraving of the City of Washington, showing Capitol Hill on the right and the President's Mansion in the distance.

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COMPTROLLER GENERAL OF THE UNITED STATES

Federal Organization for Science and Technology

How can the Federal Government best organize to carry out its responsibilities involving science and technology? The Comptroller General addressed this question in some detail in testimony before the House Committee on Science and Astronautics, July 9, 1974. The following article is adapted from that testimony.

One of our great national assets has been our leadership in science and technology and the important role played by the Federal Government in maintaining this leadership. Estimated Federal expenditures for fiscal year 1975 for research and development are approximately $20 billion. If additional evidence is needed as to the importance of science and technology, I need only refer to the growing shortages of energy and raw material resources and to the increasing concern as to our ability to maintain our competitive position in the world economy. Science and technology pervade almost every aspect of daily living and are important components of virtually all programs carried out by the Federal Government.

Role of Organization and Structure

Accepting the importance of science and technology in today's world, the question which we are addressing is "How can the Federal Government best organize to carry out its responsibilities involving science and technology?" I start with three basic premises.

First, there is no one best way to organize to assure that the major issues which have been raised are dealt with satisfactorily. It is important, therefore, to continually examine organizational structure to make certain that this structure is adapted to changing needs and situations.

Second, organization of the units within the Executive Office of the President, designed primarily to advise the President in policymaking and to assist him in carrying out his responsibilities, must be flexible and serve the needs of the individual Presidents. This has been true since the Executive Office was established in 1939. The Congress has recognized that need and has been quick to respond when Presidents have sought authority to add or subtract from units established within the Executive Office.

The third premise is that any unit

established—whether it is within the Executive Office or outside—should be responsive to the Congress' interests; in particular, it should be able to present testimony and to make available to the Congress its assessments of the science policy and programs of the executive branch. The principal officer should be confirmed by the Senate.

The recent report of the National Academy of Sciences, entitled "Sciences and Technology in Presidential Policy Making—A Proposal," focuses again upon the role of the President and the Executive Office of the President.

I doubt whether a good answer can be given to the proposal advanced by the National Academy of Sciences except in the context of a comprehensive look at the way science and technology activities are organized and conducted at all levels within the Federal Government. Even so, I will attempt to address myself to the question of the Executive Office role and organization, particularly since the Academy report reopens an old issue, especially in the light of the President's decision of a year and a half ago to abolish the formally established machinery in the Executive Office—an action which no doubt stimulated the Academy to prepare its report.

The issues involved in the President's recent actions have their roots going back to at least World War II. Inasmuch as my concern with this subject dates back to that period, my remarks are necessarily colored by my own experience and may suffer from biases developed over the time that I was more directly concerned, that is, before I became Comptroller General in 1966.

The Office of Scientific Research and Development, established by President Roosevelt under emergency powers granted to him in 1939, was designed to mobilize the Nation's scientific talent in support of the defense, and later the war, effort. Its role ran the gamut of giving policy advice, troubleshooting, resolving interagency differences, and so on.

Toward the end of the war, Dr. Vannevar Bush, who headed the Office of Scientific Research and Development, along with many other scientists in the United States proposed the establishment of a permanent agency to support *basic* scientific research. A major consideration was the difficulties faced during World War II because of the previous low level of basic scientific research effort in the United States, together with the recognition of the long-range importance of science and technology for the future strength of the United States, both militarily and economically. The National Science Foundation, which came into being in 1950, was designed to provide the answer to these concerns. In concept, its purpose was not to supplant but to supplement the research efforts of other Federal agencies. However, it was given another important role, namely "to evaluate scientific research programs undertaken by agencies of the Federal Government, and to correlate the Foundation's scientific research programs with those undertaken by individuals and by public and private research groups." This is a function to which I

shall refer later because of its bearing on the National Academy proposal.

The establishment of the National Science Foundation did not settle the question as to whether machinery concerned with science and technology was needed at the Presidential level. The question continued to be raised by individuals outside as well as within the Government. Added to this, the Korean War led the Bureau of the Budget to request a special study by Mr. William Golden, who served in the Navy during World War II and who had returned to private industry. Mr. Golden was an investment advisor, although he had considerable interest in and acquaintance with the issues involved arising from his experience in the Navy and as an advisor to the Bureau of the Budget. His proposal was to establish a science advisory committee and to appoint a Presidential science advisor, recommendations which were approved by President Truman on the advice of the Budget Director. Mr. Oliver Buckley, retired head of Bell Telephone Laboratories, was named Science Advisor to the President.

President Eisenhower continued the arrangement but placed it with the Office of Defense Mobilization, where it remained until the Soviet launch of *Sputnik* caused him to establish it directly in the White House. He named Dr. James Killian, Jr., Special Assistant to the President for Science and Technology. Dr. Killian, as you know, chaired the National Academy of Sciences panel. What was previously known as simply the Science Advisory Committee in the Office of Defense Mobilization was renamed the President's Science Advisory Committee. Subsequently, an interagency council for science and technology was established, consisting of representatives of the principal departments and agencies concerned with these activities.

The arrangement continued under President Kennedy but soon ways were being suggested to strengthen and institutionalize it. One particular difficulty was the fact that, under the traditional rules of the White House, the Science Advisor was not permitted to testify before committees of the Congress. This resulted in complaints from the Congress that no one was available to testify on overall Federal policies and programs, a point which was made more cogent by the continuing reference by agency representatives in their testimony to policy guidelines, agreements, and so forth, issued by or under the auspices of the President's Science Advisor.

To further institutionalize the arrangement and to remove the inhibition on testimony, the President approved a recommendation developed jointly by the Budget Bureau and the President's Science Advisor to request the Congress to approve a reorganization plan creating an office of science and technology, the director of which would also serve as the President's Science Advisor. The Congress approved this plan in 1962. The President's Science Advisory Committee was continued. The important evaluation function of the National Science Foundation was transferred to the Director of the Office of Science and Technology.

The more recent reorganization plan submitted by President Nixon abol-

ished the Executive Office machinery, and transferred its functions to the Director of NSF and the National Security Council. The Federal Council on Science and Technology is now chaired by the Director of NSF, and the President looks generally to the Director for overall scientific and technological advice in the civilian area. Research and development matters regarding the Department of Defense have been excluded from the charter of the Science Advisor since early in President Nixon's administration.

Presidential Concerns in Policy Formulation and Program Administration

In my thinking over the years with respect to this matter, I have found it useful to separate—to the extent possible—the types of Presidential concerns and responsibilities involving science and technology.

1. *Assurance of a strong national level of effort in science and technology.* All recent Presidents have had this basic concern because of its increasing and obvious national importance. This concern involves the level of support of basic research in our colleges and universities, the capability of our scientific laboratories, and the level of research carried on by private industry. A host of Federal programs affect this base, and many pieces of legislation are debated on their merits or demerits as they may affect the capability of the public or private sector to strengthen their research programs. In developing national goals and objectives, the President must have some means to assess how well we are doing as a Nation with respect to programs which cut across department and agency lines and which cut across different levels of government and between Federal Government and private industry.

2. *Establishing priorities within the Federal budget.* The budget presented by the President each year is essentially a statement of Federal financing priorities. For the most part, priorities submitted in the President's budget are priorities among program objectives—programs to deal with energy and material shortages, to deal with environmental pollution, to provide a strong national security, and so on. All of these programs have varying degrees of science and technology components—in some cases critical to the success or failure of the program itself. The space program is a case in point. Perhaps as much could be said for "Project Independence" and the solution to our environmental problems. Certainly, we would all agree that our defense programs depend heavily on science and technology.

3. *Program management.* As head of the executive branch, the President is responsible for the effective execution of programs approved by the Congress. Here again, the role of science and technology is great, but the President must look primarily to the heads of departments and agencies to carry out these programs. For this reason, the role of the Executive Office is quite a different one, simply because the President must hold the heads of agencies responsible for results and they, in

turn, must be held accountable to the Congress and the President for establishing the necessary organization, selecting a capable staff, and mobilizing the necessary resources to carry out the President's responsibilities. Any machinery established within the Executive Office should, therefore, be less involved—even though the science and technology component may be important. The President may well wish to have an individual or a unit to monitor progress and problems in carrying out research and development activities—particularly those which cut across agency lines of responsibility—and he may wish to have the independent advice of such an individual or unit in the event major problems arise. The difference in the role played is an important one. It does not necessarily dictate whether such a unit or staff should *exist*, but it does have a great deal to do with how the role is defined and how the President uses such a staff.

Alternatives for Consideration

What, then, are the principal alternatives with respect to the arrangements for policymaking and interagency coordination? Obviously, there are a great many that might be considered. However, there are at least three which I should like to mention.

1. *The National Academy of Sciences' proposal.* This proposal basically reaffirms the arrangements existing before the President's action abolishing the President's Science Advisory Committee and the Office of Science and Technology. It should be pointed out, however, that a principal difference is that the Academy's proposal would establish a council of three instead of the single Science Advisor to the President. Otherwise, the council, supported by staff, would function much as the previous Office of Science and Technology and in much the same pattern as the present Council of Economic Advisors. Presumably the ad hoc use of outside experts would take the place of the President's Science Advisory Committee in much the same manner as such experts were used during the Kennedy and Johnson administrations even with the existence of the President's Science Advisory Committee—that is, whenever special problems made it desirable to reach beyond the talent available in the Committee.

I believe it has been generally recognized that the combination of the President's Science Advisory Committee, the Office of Science and Technology, and the Federal Council on Science and Technology contributed a great deal, although selectively, during its existence. However, the President apparently concluded that the combination was not effective and settled on the National Science Foundation as the focal point for science policy in the executive branch.

A modification in the Academy's proposal would, of course, be to reestablish a single science advisor as head of a small staff in the Executive Office of the President. There are always problems associated with a council instead of a single advisor, even though a council avoids the charge that the President is receiving advice based on the bias of a single individual and

the field of science in which he may have specialized. While a group of three to some degree overcomes this type of criticism, it nevertheless tends to be more cumbersome, particularly because the council is concerned with testimony before the Congress and is called upon to take the lead to resolve interagency differences. Perhaps the Academy's proposal to name one of the members of the council as science advisor would partially overcome this difficulty, although I would be inclined to opt for a single advisor instead of a council.

2. *The Director of the National Science Foundation as policy advisor and coordinator.* The second alternative would be to continue the present arrangement under which the Director of NSF Foundation in effect wears two hats—Science Advisor to the President and Director of NSF. This arrangement has many precedents and is therefore not a dramatic departure from past practices. President Eisenhower used the Chairman of the Atomic Energy Commission as his advisor on atomic energy matters at a critical point in our nuclear energy program. Office of Management and Budget Director Roy Ash currently serves as a Presidential assistant. The effectiveness of these "two hat" arrangements depends in large measure, it seems to me, on the personality of the individuals and their relationship to the President.

Two major concerns have been expressed with respect to the present arrangement.

—The Director of NSF is a contender for research and development funds along with other contenders in the executive branch. It is argued, therefore, that the Director cannot be an objective advisor to the President and the Director of the Office of Management and Budget in formulating the budget or in establishing priorities for research and development within total funds available for science and technology. His views, therefore, will be attacked as being biased, regardless of how objective he might be. Reorganization Plan No. 2, which established the Office of Science and Technology and which transferred the evaluation and coordination function from NSF to the Office, was based on this premise. The President's message, outlining the 1962 plan to the Congress, argued that:

> * * * the Foundation, being at the same organizational level as other agencies, cannot satisfactorily coordinate Federal science policies or evaluate programs of other agencies. Science policies, transcending agency lines, need to be coordinated and shaped at the level of the Executive Office of the President drawing upon many resources both within and outside of Government. Similarly, staff efforts at that higher level are required for the evaluation of Government programs in science and technology.

—The Director of NSF suffers from the limitation that his charter does not give him jurisdiction with respect to research and development programs of the Department of Defense. While this constriction is one which the President could change, it nevertheless represents a recognition of the difficulties of having the Director of NSF serve in a coordinating role with respect to research and development programs of the Defense Department.

Whether these criticisms and limitations are significant depends in part on how the President carries out his budgetary responsibilities and the staff resources available to the Director of OMB to satisfy himself that he is giving the President the best possible advice with respect to priorities in the field of science and technology. A relevant point here is that the Director of OMB has been criticized in the past on the grounds that he did not have scientific experts available to him and therefore lacked competence to make the qualitative assessments of priorities which make up the judgments on major research and development investments. This was a consideration in President Kennedy's decision to request the Congress to establish the Office of Science and Technology instead of establishing a science staff within OMB.

It should be pointed out, on the other side of the issue, that the same argument with respect to the expertise on the staff of the Director of OMB has been made in most other major fields as well—transportation, agriculture, national defense, and so on. I doubt whether it would ever be possible for the Director of OMB to satisfy all of these criticisms. Moreover, I believe that any Director of OMB must turn primarily to the experts in the operating agencies—and perhaps outside the Government—for advice on major problems and issues. Science and technology programs are no exception.

In addition, as has already been pointed out, science and technology, for the most part, are simply components which contribute to accomplishing program objectives in such fields as transportation, medical care, national defense, and food production. Program objectives and goals are the principal considerations in establishing budgetary plans, and are more important than the amount of money contemplated for the science and technology component per se. The important thing here, it seems to me, is that the Director of OMB be assured that the agency head has the best scientific and technical advice available to him and that he has the competence to expend the requested funds effectively.

Although too little time has elapsed for an adequate evaluation of the new arrangement, in my judgment, many seem to believe that it is not a satisfactory one for the reasons presented in support of establishing the Science Advisor in 1951 and the Office of Science and Technology in 1962. Critics of the present arrangement are careful, however, to state their views without derogating the qualifications and competence of the Director of the National Science Foundation and his staff.

3. *A cabinet department.* A third and somewhat more radical proposal is to establish a department of science and education or a department of science and technology. This idea, again, is not a new one but it has been advanced from time to time with somewhat different combinations of responsibilities. One significant variable is whether the education function should be included in view of the importance of a strong base of scientific manpower and the heavy involvement of colleges and universities in carrying out research programs.

In establishing such a department, it would obviously not be possible to bring together all of the Government's scientific and technological programs. This department could, however, bring together such major components as the Atomic Energy Commission, the National Aeronautics and Space Administration, NSF, the National Oceanic and Atmospheric Administration, and the National Bureau of Standards. It would also provide a cabinet officer who could serve as the President's advisor on scientific matters generally and coordinate, on behalf of the President, cross-cutting research and development matters in much the same way the Secretary of Transportation takes the lead in the transportation area currently.

A Summary of Major Considerations

As I perceive the issues involved, the major concerns can perhaps be summarized in the following questions.

—Just how important are science and technology in domestic and world affairs? Does this subject merit continual consideration at the Presidential level of decision-making?

—How can we best determine whether our science base is sufficiently strong and viable to insure our continued international leadership and competitive position, national security, quality of life, and a healthy economy?

—How can we develop a national strategy and investment plan for research?

—What is the best structure and framework for dealing with decision dilemmas that involve establishing science priorities?

—How can we strengthen the Government's ability for early recognition, alert, and warning concerning impending problems with significant scientific components, to avoid crises or at least to soften their impact?

—How can we improve our ability to mobilize scientific and technological resources to head off or deal with impending crises?

—What executive branch science structure will serve Presidential needs and at the same time be accessible to the Congress and responsive to its oversight responsibilities?

There seems to be little doubt that the all-pervasive impact of science and technology on our national security, quality of life, economy, and international relations is so important that Presidential decisions regarding national policy, strategy, and tactics must have the benefit of the best advice available. The National Academy Committee bases its recommendations on this fact. In matters such as arms control and international safeguards; national security and defense posture; foreign relations and sharing of technological resources with other nations; potential critical shortages of energy, materials, and food; environmental protection; and the economy, objective, thoughtful and imaginative advice from the science community is vital.

Whether vested in one individual or

a council, Federal science leadership at the Presidential level requires special attributes. First of all, it must be statesmanlike and acceptable to, trusted by, and with direct access to the President. Secondly, it must be respected by the community of scientists and engineers. It must not be an advocate of science, per se, but should serve as an interpreter and advisor concerning all matters with a science component.

An annual report, as suggested in the Academy proposal, should be prepared on the state of science and should have high priority.

All of these functions to some extent transcend agency jurisdictions. If NSF is to carry them out, some portion of the agency must be able at times to back off, put on another hat, and evaluate itself as well as the performance of other research and development programs.

In considering the Presidential advisory role and the central oversight of science and technology, it may be useful to consider as a model the corporate structure employed by a number of high technology companies. Reporting to the chief executive officer, there are both operating and staff vice presidents. The operating vice presidents usually have line management responsibility for operating departments or divisions concerned with individual products or groups of related products and services. Each technology-intensive product division may have its own chief engineer and mission-related research and development. Among the corporate staff vice presidents, various functional elements are represented, including marketing, public relations, the corporate comptroller, the treasurer, and a chief scientist or vice president for research and engineering.

The Federal counterpart of this latter individual at present is the Director of NSF. Formerly, the Director of the Office of Science and Technology would have been the counterpart with a strong assist from the Director, NSF. The vice president for research and engineering, together with his supporting staff, in cooperation with the chief engineers of various operating divisions and occasionally with help from outside consultants, serve the chief executive officer in much the same role as we have been discussing here in relation to the Presidential advice and central Government oversight of science and technology.

Some of these companies also have a central corporate research division in which longer range exploratory research is done to advance a broad technology base to spawn new products and fill in gaps that are not clearly under the purview of any operating division. To a large extent, the National Science Foundation plays this role in the Federal establishment.

In most companies employing this type of structure or model, the planning and performance of research and development for individual product lines is highly decentralized and delegated to the operating divisions—similar to the Federal pluralistic approach. The role of the corporate vice president-chief scientist in no way preempts this authority but does provide oversight, coordination, policy guidance, troubleshooting assistance, and advice and certification to the chief

executive officer on matters that affect the company's overall technological posture.

How best can we structure the Federal science policy apparatus to accommodate: the advisory role to the President, the oversight and coordination of Government-wide research and development, and the solving of long-term problems with a science component? These three functions are closely interrelated. The National Academy Committee report deals to some extent with all three of these functions, but its main thrust is toward reestablishing the Presidential advisory function on a formal basis in the Executive Office.

In general, it seems to me that the most important need of these times is for the Congress to find a way for those with important responsibilities and good ideas to have the opportunity to put forward their views and then to go through a process of testing those views by evaluating those areas and projects which have yielded high returns and those which have not succeeded to the same degree. In this process, a thorough effort should be made to understand the requirements for administrative success as well as scientific and engineering progress. Know-how in systems management and in large scale governmental administration, as well as in science and technology, should be an essential ingredient of governmental research and development advice and decisionmaking. In many cases, the departments and agencies will have more of this than any group of scientists or engineers who are chosen for a White House role.

D. L. SCANTLEBURY

Can the Auditor Survive the Computer Age?

The computer has played a significant role in the upsurge of fraud and embezzlements reported recently. In New York, a bank teller is under indictment for embezzling over $1.5 million by manipulating accounts in a central computer through a teller terminal. In Los Angeles, a $2 billion fraud in the resale of fake insurance policies is alleged in the Equity Funding Insurance Company case, and computer operations are deeply involved. In most cases of computer manipulation, audit has not detected the fraud or misuse. The author made the following remarks at a workshop of the 23d National Symposium of the Federal Government Accountants Association in June 1974 in Dallas, Texas.

One of the most pressing problems we have today in the auditing field is how to detect computer misuse. By misuse I mean use of the computer to aid dishonest people in fraud and embezzlement of other people's funds. I have a deep personal interest in this area for two reasons. First, GAO's Financial and General Management Studies Division, of which I am the director, is responsible for approving the design of Federal agency accounting systems and for reviewing those systems in operation. Thus my staff and I have a real responsibility for insuring that Government accounting systems are designed to make fraud, embezzlement, or other misuse of Government resources as difficult as possible and to detect any computer misuse in the Government agencies we audit.

My second interest is as a member of the accounting and auditing profession. As an auditor and certified public accountant, I am concerned with the impact that computer fraud can have on that profession.

The Equity Funding Insurance Company case has serious implications for auditors and so does the Union Dime Savings Bank case involving embezzlement of $1.5 million. Many other less

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famous cases are known to those who keep in close contact with this subject. For instance, in their study for the Stanford Research Institute,[1] Donn B. Parker and his associates reported on 148 cases of computer abuse. Some of those involving fraud and embezzlement are:

1. A bank depositor exchanged blank deposit slips on the counter in the bank for deposit slips coded with his personal account number. Deposits to his account from other people's funds totaled $250,000 in 4 days. He withdrew $100,000, disappeared, and has never been caught.
2. An employee of an insurance company changed several deceased insured persons' account numbers to his own to collect their pensions. He was caught when a staple in a punch card forced manual handling which revealed several cards with the same number.
3. A public official of a city was alleged to have improperly used $100,000 worth of computer time for his reelection campaign.
4. A computer operator pressed the repeat button on the printer to print 200 extra copies of his own paycheck.

These are not the only types of problems auditors have to worry about. Vandalism or misuse of computer information are also problems. Computers have been "shot" and tape files ruined by disgruntled employees or customers. Losses from such actions can be severe. In one case, an insurance company's tape files were allegedly destroyed by a discharged employee with a resulting loss estimated at $10 million.

Have Computers Added To the Fraud and Embezzlement Problem?

Although fraud, embezzlement, and vandalism predate computers, there is little doubt the computer has added to these problems in several ways:

—First, computer frauds tend to involve larger sums than previous "white collar" crimes. This seems to have something to do with the inherent speed and complexity of computer systems.

—Second, computers are vulnerable to vandalism because they are composed of expensive, delicate electronic components.

—Third, traditional systems of internal control have had to be modified to accommodate the computer. New internal control systems have to change rapidly if they are to keep up with the fast pace of change in computer technology.

A further problem for auditors in public practice is the trend toward placing greater responsibility on auditors for detecting or reporting all kinds of losses by their clients and the liability the auditor assumes if he does not detect those losses.

To make the situation even more perilous, the propensity for increased

[1] Donn B. Parker, Susan Nycum, and S. Stephen Oura, "Computer Abuse," Stanford Research Institute, Nov. 1973.

computer-related fraud is believed to be great. A consensus of 30 experts in this field recently indicated that losses, injuries, and damages directly associated with computers will exceed $2 billion annually by 1982.[2]

What Effect Is All This Going To Have On the Auditor in the Next Few Years?

Some of the features needed to provide security and control over computerized systems can be provided by technology. However, Mr. Parker and his associates have reported that no comprehensive technological solution is at hand and none is expected for about 6 years. And even then, practical cost considerations will be a factor. Accordingly, Mr. Parker concluded that, for the next few years at least, safety in using automatic data processing will depend principally on ADP audit and auditors will have to serve as the primary line of defense.

Unfortunately, the auditors' record in detecting such problems has not been at all good. Mr. Parker, in his recent study, reported that most known cases of computer fraud were detected accidentally, with few instances of discovery or successful prevention by people charged with computer security.

What Can We Do About It?

I think those of us in the auditing profession must redouble our efforts to provide effective training to our audit staffs. We must see that, in every audit where computers are involved, the system is examined by an auditor skilled in understanding and auditing computers. There really is no viable alternative. We cannot any longer "audit around the computer." We must understand how it operates, how to insure that proper controls are included in the system, and how to test those controls to see that they are working properly.

Audits involving computers should not be undertaken without staffs skilled in both auditing and computer science. The only way I know to get such people in the numbers we need is to train our staffs extensively. Such training is difficult. It is difficult to spare the people for the time required, and it is difficult to devise good training programs. But if the auditor is to survive the computer age, he really has little alternative.

In GAO we have worked out a training course with the Wharton School of Finance of the University of Pennsylvania to which we have sent nearly 200 staff auditors. It is an intensive course lasting a month and requiring real dedication by the students. It has been successful, but we are not satisfied with this course alone and are studying our needs for training in computer science agencywide. We also employ about 25 computer specialists, many of whom are not auditors but have skills we need in our audit work. We are proud of the start we have made in this direction, but we are not at all sure that

[2] G. Solavcik, T. Gordon, and N. Adams, "On the Nature of Economic Losses Arising from Computer-Based Systems in the Next Fifteen Years," Institute for the Future, R-23, Mar. 1972.

considerably more will not be required to help us meet the challenge we face in the next few years.

Roy Saltman of the Institute for Computer Science and Technology, National Bureau of Standards, and a consultant to the GAO Office of Federal Elections, discussed the rising concern about the accuracy, security, and confidentiality of data systems in a recent paper titled "A Proposal: Regulation of Public Data Systems by Licensed Professional Audit," stating:

> There is no question that the accounting profession will rise to the occasion and surmount the problems raised by the new computer technology.

I believe Mr. Saltman is right, but rising to the occasion requires effort and planning, and we auditors need to start now to see that his prediction comes true.

Computer Adroitness

While really more an instance of old-fashioned fraud than a feat of computer manipulation, the Equity Funding rip-off could hardly have reached the magnitude it did without the computer's adroitness in fooling auditors from four different accounting firms. The case pretty well demonstrated that conventional auditing practice is all but helpless when confronting deception involving computers. The auditors have lost their traditional "paper trail"—the detritus of indelibly inscribed orders, invoices, bills, and receipts that the men in the green eyeshades pore through on the track of irregularity.

Tom Alexander
"Waiting for the Great Computer Rip-off"
Fortune, July 1974

GRETCHEN C. SCHWARZ

Sharing the Wealth

The usefulness of GAO reports can be greatly increased by alertness of regional office staffs to the needs and interests of government officials within their geographical boundaries.

We in GAO are well aware that we work for the taxpayers indirectly through the Congress and, as taxpayers ourselves, we certainly want to give them the most for their money. The cost to produce a report is quite high. Probably our findings, disclosed in the report, saved the Government money or increased efficiency or effectiveness —but this is not always enough, this is not always maximizing the usefulness of a report. We must also try to reach those who would not otherwise see the report and who could benefit in one way or another from it. To meet this goal, the Washington regional office has been sending copies of reports to a variety of potential users at Federal, State, and local government levels within our regional boundaries for the past few years.

It is helpful to keep in mind that, although GAO headquarters distributes reports on the national level, we in the regions need be concerned in this endeavor only with Federal officials at local field installations and with State and local government officials. We in the regions should have a closer knowledge of what government officials in our areas need. Our distribution, however, should be reported to headquarters' Report Distribution Section.

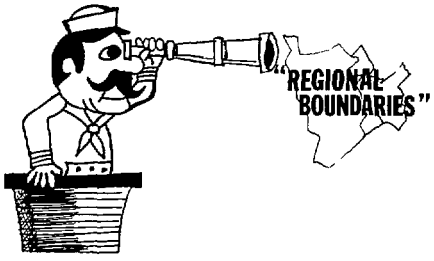
Responsibility for suggesting names of recipients is a joint staff effort. Suggestions often result from past professional contacts or from civic involvement of staff members. Additional recipients are identified through State manuals or local directories which present governmental organization at these levels. At the Washington regional office, a central control point coordinates the entire effort, handles administrative matters, and insures a united and effective program.

Our distribution policy is based on the understanding that the types of programs GAO reviews may involve a wide range of people not only at the Federal level but also at the State and local levels. Our suggestions and observations may be useful in these cases to persons not directly involved in the review. They may also be valuable to administrators of entirely separate pro-

Miss Schwarz is a supervisory auditor in the Washington regional office. She joined GAO in 1966 and is a graduate of Kansas State University. Miss Schwarz is a past president of the Northern Virginia Chapter of the Federal Government Accountants Association and recently served as chairman of the National Nominations Committee.

grams which have some similarity to the ones reviewed. We must make sure that such people have the opportunity to see our reports.

The Washington regional office has found that many recipients readily grasp the experience of others and apply it to their own operations. For



example, we sent GAO's study of port-of-entry inspections ("A Single Agency Needed to Manage Port-of-Entry Inspections—Particularly at U.S. Airports," B–114898, May 30, 1973), which was performed primarily at Kennedy International Airport, to the manager of Dulles International Airport. In thanking us, he said, "Reviewing the study we have found a number of points of interest to us that will be helpful in future planning of our International Arrivals Area."

The District of Columbia Director of Human Resources stated, after receiving our report on steps which could be taken to improve health care delivery to veterans ("Better Use of Outpatient Service and Nursing Care Bed Facilities Could Improve Health Care Delivery to Veterans," B–167656, Apr. 11, 1973), that staff members had reviewed the report and that:

> Their considered observations indicated that the respective recommendations set forth in the study suggesting certain applications of new medical, dental, clinical, and administrative techniques could significantly enhance the delivery of all health services to patients at private hospitals as well as other hospital systems. [We] will be including this document as background data material while conducting feasibility studies designed to improve our extensive medical services delivery system.

Not only may improvements not anticipated in the original report result, but, in providing copies of our reports, we are building goodwill for GAO and perhaps establishing rapport with officials with whom we are dealing or may deal in the future. Recipients have expressed their appreciation of our efforts in such terms as "I am most pleased to have [the report] and to be able to share it with the members of my staff"; "We appreciate your keeping us informed"; and "I appreciate

"JOINT STAFF EFFORT"

your thoughtful interest and courtesy in sharing these findings with this department."

At times recipients request additional copies of a report for further distribution. Our most notable request came from the Chief of Chaplains, U.S.

Navy. Concerning our report on "Alcoholism Among Military Personnel" (B–164031(2), Nov. 2, 1971), the chaplain wrote, "The document is most impressive and I have requested 1,000 copies from [GAO] so that it may be distributed to all active duty chaplains serving in the Navy at this time."

In the past several years the Washington regional office has sent copies of about 60 different reports to a total of almost 500 people. The responses received encourage us to continue. In turn, we would encourage other regional offices to initiate such a program.

Congressional Information

Expansion of congressional capability to command sources of reliable information is a precondition of effective legislative budget control.

Senator Lee Metcalf
Congressional Record
March 20, 1974

ARLEY R. WHITSELL AND WELDON E. STANLEY

They Said These Were 8 to 5 Jobs

Over the years, many in GAO have regarded audits of financial statements and operations as repetitive, simple 8 a.m. to 5 p.m. jobs. This article illustrates through a description of one such audit that they can offer as much challenge and job satisfaction as any other type of audit.

"I understand you are going on an extended vacation," an associate said to me with a smirk.

"What?" I realized it was a dumb response, but I had no plans for a vacation and certainly not a long one.

Still smiling, he said, "Aren't you going to be site supervisor of the Panama Canal financial audit? That'll be a real vacation, compliments of GAO; you only need to repeat what was done on the last audit."

On the basis of this conversation and the times we have been questioned by other staff members as to how we can continue maintaining interest in financial audit work, there are apparently many in GAO who believe financial audits are child's play compared to operational reviews. To the skeptics, we wish to show that an auditor may encounter as many problems in planning and making a financial audit as in an operational review. Fellow auditors! The proper approach and criteria are not always clear on a financial audit either.

Financial audits provide an equal opportunity to exercise imagination in planning and executing an audit. We hope to demonstrate this by describing the nature and type of problems faced in our most recent audit of the Panama Canal Company and Canal Zone Government (the canal enterprise).

The Canal Enterprise

GAO is required by the Government Corporation Control Act to audit the financial operations of the Panama Canal Company, a wholly owned Government corporation, "in accordance with the principles and procedures applicable to commercial corporate transactions." Because the company and the

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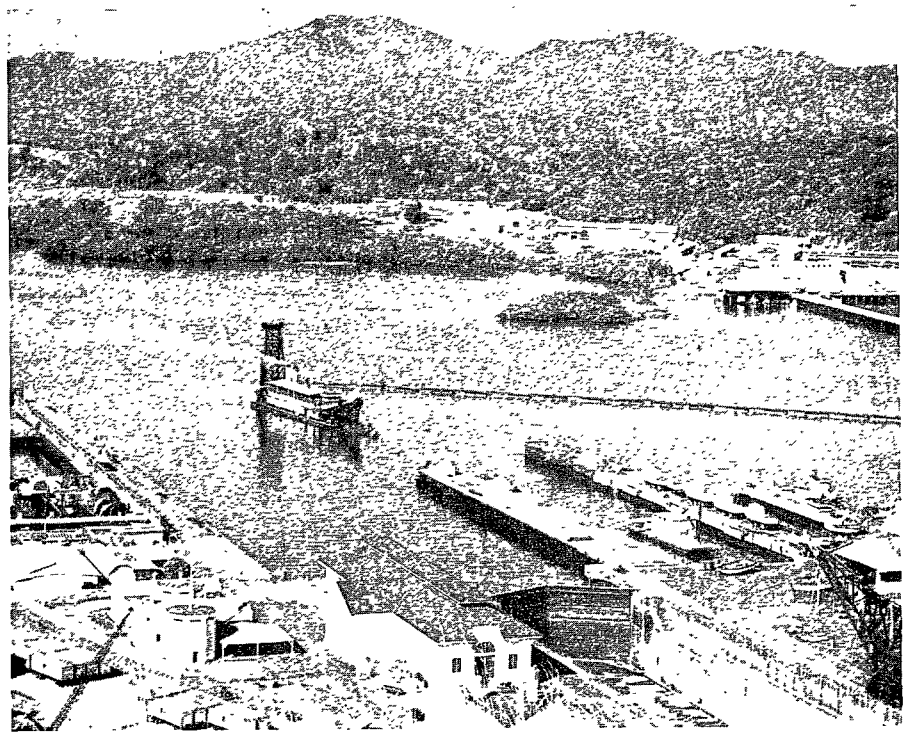
Canal Zone Government—the independent agency of the United States charged with the civil government of the Canal Zone—are so closely related in mission and organization and because the company is required by law to absorb the net cost of the Canal Zone Government, GAO also audits and issues an opinion on the financial statements of the Zone Government.

The canal enterprise is a large, multifunctional operation. It operates and maintains the canal; provides repair and various other services to oceangoing vessels; operates a railroad line and a steamship service; runs a port; maintains and rents housing; operates various retail businesses for the sale of gasoline, clothing, groceries, entertainment, and appliances principally to residents of the Canal Zone; and is responsible for the power, water, and communications systems in the zone.

The canal enterprise also has numerous civil functions as well. These include fire protection, police protection, the court system, the postal system, primary and secondary schools, and medical services.

As of June 30, 1973, the canal enterprise had assets amounting to about $679 million, with approximately 88



The suction dredge "Mindi" performing normal maintenance in the Balboa Harbor (Balboa industrial area in foreground). In addition to the continuous maintenance of harbors and channels, the company recently used its dredging equipment to lower certain sections of the canal channel bottom.

percent belonging to the company. During fiscal year 1973, the enterprise generated gross revenues of more than $230 million. Approximately 13,680 full-time personnel were employed in 1973; of these, 10,053 were non-U.S. citizens.

The canal enterprise is designed to be operationally self-sustaining and to impose no burden on U.S. taxpayers. Revenues from the company's canal transit and supporting service operations are used to finance its operating and capital expenditures and to reimburse the U.S. Treasury for the net cost of operating the Canal Zone Government.

Financial Audits Are Not Routine

A highly complex and sophisticated accounting system serves the canal enterprise. This system provides the interrelationship needed for the wide range of canal enterprise functions. It continually undergoes modification and expansion to provide for changes in the operational functions and for improvements.

Although we are responsible for the successive audits of the canal enterprise, the diversity of operations and changes in accounting systems and auditing concepts preclude the audit from being routine. Revisions to the audit program must constantly be made as changes in the accounting systems and the audit approach occur. Some major changes to our audit approach, as we discuss below, have been adopted to expedite audit performance.

Furthermore, the enterprise has been computerizing more and more of its accounting systems. These changes have significantly affected the audit approach we now follow and the audit techniques we use.

As an example, between our 1970–71 audit and our 1972–73 audit, the enterprise fully converted its general accounting system to the computer. This system automates the posting of entries from the various subsystems, such as inventory and payroll, which had been previously computerized. This change necessitated revisions in our audit procedures and enabled us to use computer techniques and apply a new approach to testing transactions that were not previously possible.

The computerization of various elements of the accounting system also has had an important bearing on internal control, and the evaluation of these controls has required applying different procedures. Because the accounting system of the canal enterprise is largely on computer, we were able to make extensive use of computer test decks in evaluating the controls of the computerized processes.

The changes in the accounting systems are still not complete. For example, during our next audit of the canal enterprise, we will have to consider the major redesign and computerization of the accounts receivable system.

The Audit Approach May Be Complicated and Sophisticated

We divided our 1972–73 audit of the canal enterprise into three phases: a review of the internal controls, an audit of transactions, and a verification of

the existence of assets and liabilities.

Our review of internal controls considered not only the usual manual internal controls, including internal audit work, but also those built into the data processing system by the computer manufacturer and those included in the computer programs. With respect to the latter, our work was directed toward identifying the various controls, flow-charting all financial data from its source through the new general accounting system, and determining whether the company had implemented the additional computer controls that we had previously recommended. (For a description of the audit technique we used to evaluate one of the canal enterprise's computer subsystems, we refer you to an article entitled "Using Test Decks in Financial Audit Work," *The GAO Review*, Spring 1972.)

We also used the computer to identify unusual changes in various records in order to select events or transactions for review on an exception basis. These changes included:

—Significant increases in unit prices of operating materials and supplies between June 30, 1971, and June 30, 1973.
—Unusual changes in the quantity of materials and supplies in inventory during the same period.
—Abnormal increases in employee salaries during the same period.
—Employees added during the preceding 2 years.

In using the computer, we set out what information we needed, and our ADP staffs in Dallas and Washington prepared the necessary computer programs for extracting and compiling the information.

Traditional verification procedures, such as physical counts and written confirmations, were used to verify the existence of such assets and liabilities as cash, accounts receivable, and accounts payable.

We followed a totally different audit approach in the audit of transactions. In prior years, the accuracy of the bookkeeping was verified by the traditional "audit by account" method, which included an analysis of transactions entered in specific accounts. Under this method, we selected judgmental samples of transactions to be audited on the basis of such factors as the dollar balance in an account, the extent of tests made by the internal auditors, and the account's activity. The proportion of transactions tested obviously varied from account to account.

During our recent audit, we implemented a different auditing concept which, along with the computerized general accounting system, enabled us to audit primarily through an "audit by transaction" approach. With this method, we were able to reduce the extent of our tests of transactions while achieving more reliable results.

The Revised Audit Method

In our prior audits, our use of the computer was limited to testing computer controls, selecting samples, and making various analyses of several of the computerized subsystems; i.e., payroll and operating supplies. However,

with the recent additional computerization of the general accounting system, it became clear that we needed to revise our traditional audit method, not only to provide a more systematic approach in selecting transactions for testing but also to provide the most efficient means of detecting the type of errors to which the computerized system is susceptible.

To accomplish this objective, we implemented an auditing concept developed by the public accounting firm of Haskins & Sells. Under this concept, the auditor tests asset and expense accounts for overstatements and liability and income accounts for understatements. He tests for misstatements only in one direction rather than two and he therefore reduces his possible tests by half.

Any amount appearing in the financial statements is subject to being overstated or understated. Because of the nature of the double entry accounting system, the testing of one account automatically results in a test of one or more contra-accounts (the other side of the transactions). For example, if an asset account is overstated and the books are in balance, then either another asset or expense account is understated or a liability or income account is overstated. Thus, the auditor is able to develop a system of *primary tests*—tests for primarily detecting overstatements or primarily detecting understatements—that results in testing all accounts for both overstatements and understatements. The automatic evaluations of contra-accounts are considered *secondary tests.* (See table.)

Application of the Concept

Because in tests for overstatement the auditor is concerned with possible errors in what has been recorded, these tests are inherently easier than tests for understatements. To test for overstatements, the auditor has only to determine whether the amounts appearing in the general ledger accounts are valid. Thus, in testing asset and expense account transactions, the auditor selects what is recorded and tests the items for genuineness; that is, he proceeds from the general ledger back to the supporting documentation.

In the canal enterprise audit, we were able to test for overstatements in assets and expense accounts by using computer programs to make various stratifications of all transactions processed through the general accounting system for a selected period and to obtain a list of statistical samples of all debit transactions in asset and expense accounts for the period. By verifying these sample transactions against the source documents, we were assured

Pattern of Examination

	Primary test		*Secondary test*			
			Assets	*Liabilities*	*Income*	*Expenses*
Assets	O	(overstatement)	U	O	O	U
Liabilities	U	(understatement)	U	O	O	U
Income	U		U	O	O	U
Expense	O		U	O	O	U

that these accounts were not materially overstated. Since the books were in balance, we were also assured that the debit amounts in these accounts were not intended for other accounts (the secondary test).

Now the problem of an understated balance. Could the procedures we used to test for overstatements also be relied upon to detect understatements? No! For instance, consider sales. Determining that all recorded sales are genuine provides no assurance that all genuine sales have been recorded. Therefore, to detect unrecorded transactions, the auditor must first find what should have been recorded and then see if it was; that is, the auditor must direct his tests from independent evidence forward to the general ledger.

Since the source documents for the canal enterprise's financial transactions were not computerized, we had to test for overstatement of liability and income accounts primarily by manually selecting transaction documents which directly or indirectly related to a potential liability or income process and then determine that the transactions were properly recorded.

However, we were able to use the computer to determine the reasonableness of certain revenues. For example, with respect to the company's tolls revenue, we checked the reasonableness of the amount recorded by comparing it with an amount that we computed using data extracted from a separate information system. In this case, we used a computer program to extract selected information from the company's ship data bank system and to apply the applicable toll rates to the types of transits involved.

Other Challenges

As with operational audits, financial audits present new problems during each examination. The characteristics of the problems in a financial audit are different in that they relate to the fairness and accuracy of published statements as measured by judgment and against generally accepted standards and principles. A financial audit problem may involve the propriety of handling peculiar transactions, the nature of classifications on the financial statements, or the changes in accounting procedures and policies. The challenges offer the auditor the opportunity to apply directly the accounting knowledge that he seldom uses while on operational audits.

A financial audit of a large enterprise that has such a wide range of activities as the canal enterprise cannot help but encounter many seriously complex accounting and auditing problems. But such encounters equate to an interesting and rewarding experience.

The canal enterprise audit perhaps had more challenges and problems than the normal financial audit. We quickly learned that homework and weekend workshops were inseparable parts of this audit—it was not an 8 to 5 job.

During our 1972-73 audit of the canal enterprise, the revised audit techniques mentioned in the preceding section presented additional challenges to the audit staff. The auditors had to deal with the relatively unfamiliar field of automatic data processing as it was

involved in the accounting system and performance of the audit. And they had to deal with these difficulties while applying audit approaches new to them.

In testing various transactions that were randomly selected, the computer provided the needed information that was on file. In some instances, however, the files being queried did not maintain the individual transactions but reflected a rollup of certain similar transactions. A case in point is the payroll. Each payroll transaction on the computer file represented various numbers of employees, which created a multiplier effect on the test sample. To test the validity and accuracy of each randomly selected transaction back to the source documents of each employee would have been an extremely time-consuming task. Furthermore, the tests would have been expanded to unnecessary limits for the desired reliability.

After familiarizing himself with the computerized payroll system, the auditor handling this segment of the audit selected another, more detailed, computer file which represented each individual's payroll record. The totals were verified against the general ledger, and individual pay transactions were randomly selected and verified against the appropriate source documents.

The audit program for the next audit will be patterned to some extent after the successful approaches, similar to the one above, devised by the audit staff during the 1972-73 audit.

During our audit of the canal enterprise, we also had to deal with eight accounting policy changes. The implementation of these changes not only complicated the audit but added interest.

We had to assure ourselves that the accounting policies being implemented were acceptable; that the accounting for the changes was proper; and that such changes were properly disclosed in the financial statements. We also had to make certain that the accounting changes were clearly justified. Sound easy? Just research the opinions and statements of the Accounting Principles Board of the American Institute of Certified Public Accountants, you say! Sorry, but, as we often encounter in our operational audits, specific criteria have not been established on many of these policies.

A case in point is the accrual for future losses through a self-insurance reserve. There are various articles on the subject that present strong arguments for or against such a practice; but which are correct? This is a subject currently under consideration by the Financial Accounting Standards Board established last year but the Board has not completed its work on the subject. In our case, we had to make a decision before issuing our opinion on the company's fiscal year 1973 financial statements.

In fiscal year 1973, the company adopted the policy of providing for losses from marine accidents through a self-insurance reserve. Previously, such losses were recognized when a casualty for which the company was responsible occurred.

The company changed its method of accounting for casualty losses be-

cause of the fluctuations in these costs and the belief that the company should have a reserve to buffer the impact of possible casualties on the net revenue of a particular year. The company's position is that, since it is precluded by law from purchasing outside insurance to cover these risks, establishing self-insurance reserves provides for the normalization of such costs over more than one accounting period in consideration of the ratemaking process.

Our problems with this change involved the resolution of several basic questions:

—Is this accounting policy change justified?

—Is it proper and acceptable to accrue for future losses through a reserve account?

—Are the amounts of the annual provision for the reserve and the amount of the ultimate reserve reasonable?

In reaching satisfactory answers to these questions, we met with officials of the canal enterprise; we researched the Accounting Research Bulletins, opinions of the Accounting Principles Board, and other relevant papers, particularly those dealing with accounting for regulated businesses; we obtained information from the Financial Accounting Standards Board; and we queried AICPA's computerized information retrieval system on companies that had self-insurance reserves.

We finally agreed to this accounting change and its implementation procedure, primarily on the basis that the policy is allowed in private practice and such a procedure appears permissible for a regulated business.

The importance of the regulated aspect is that generally accepted accounting principles, as applied to regulated businesses, give recognition to the ratemaking process and permit costs to be recognized differently. The Addendum to the Accounting Principles Board opinion number 2 addresses this point.

Our problems with the various accounting changes were further complicated by the involvement of a public accounting firm. The canal enterprise engaged a public accounting firm for advice on the method of implementing the changes and the extent of financial statement disclosure required. Our opinion did not always agree with that of this firm, especially in the judgmental area of what constitutes "adequate" financial disclosure.

Concluding Remarks

Fellow auditors, if you remain unconvinced that financial audits can be as challenging as any other work done by GAO and can offer equal opportunities for the staff to demonstrate initiative and imagination, then we urge you to become involved in such an audit. You may be surprised by what you learn, particularly the fact that such assignments serve to refresh and advance the knowledge of accounting concepts you acquired in college. You will likely find that additional rewards come from the actual application of your accounting and auditing knowledge.

PHILIP A. BERNSTEIN

The Fly-through Approach to GAO Reviews

72158

How can GAO reviews be performed faster so that the resulting benefits can be realized as quickly as possible? The author discusses one method for achieving this objective which, he believes, also has the potential for reducing audit costs and improving staff morale.

Why did it take so long to do this job? When are you going to get that report out? How could that job possibly have taken 2,000 man-days? These are the types of questions being asked more and more as we attempt to emphasize timeliness and cost control in performing our various assignments.

We in the Seattle regional office have, over the past several years, experimented with an audit approach designed to minimize both man-day investments and calendar time. This method has come to be called by a number of different names, including "fly-through" and "fly-in." Regardless of what we call them, the principle is the same: to obtain broad geographical coverage in audit work involving major issues through quick visits to several locations by one audit team.

Before proceeding further, I would like to set forth the assumptions on which the use of such a method is based.

—The major factors affecting our ability to complete our work rapidly and efficiently are communication and coordination.

—The difficulty of obtaining effective communication and coordination increases rapidly as more and more people become involved in performing any given assignment.

—Although good management practices can reduce the extent of communication and coordination problems, the wide geographical dispersion of our multiregion audit teams and the limitations inherent in the English language insure that these problems will always be with us.

—An audit team responsible for an entire job, including planning,

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execution, and reporting, will obtain greater job satisfaction and be more committed to the assignment objectives than will a team responsible only for executing part of the job.

Communication and Coordination Problems in a Typical Multiregion Job

Consider the various steps involved in planning and conducting the typical multiregion job.

First, a survey in one or two regions may be made taking several months. Once issues have been identified for review, the locations at which the work will be done must be identified. Arrangements are then made for the participation of several other regions.

Meanwhile, one region (or the Washington operating group) that made the survey must prepare an audit program which, in conjunction with field trips or a job meeting, has to impart to the other regional staffs all of the background developed during the survey. Also, of a less tangible nature, the assisting regions' commitment to the objectives of the job must be obtained if a real team effort is to be developed.

Typically, not all regions are able to start at the same time or provide the same level of staffing. Therefore, the review proceeds at varying rates of speed at the different locations.

During the job, constant communication is necessary among all regions. This involves a multitude of telephone calls, site visits, memorandums, and meetings to discuss and evaluate the issues as they are developed and to modify the audit approach when necessary.

At the end of the job, each region prepares summaries designed to communicate to the region responsible for writing the report what was done, what was found, and what was concluded. Because the assisting regions cannot know what information will be selected for inclusion in the report, a great deal more material is carefully summarized, referenced, and reviewed than is ever used. Again, the assisting regions generally do not finish at the same time and, in some cases, completion of the report is delayed because the region writing the report has to wait for the work of the region finishing last.

As the report is written, the writers have difficulties in interpreting working papers or in resolving real or apparent inconsistencies in the work done by the various regions; this results in further telephone conversations, meetings, and/or the necessity for more audit work before the draft report can be completed.

Under these circumstances, is it surprising that the average field time for a detailed review resulting in a report to the Congress is 10.5 months? Add a typical 6-month survey to this figure and you can see that there is a lot of room for improvement.

The Fly-through Procedure

The fly-through procedure works in the following way.

One region makes a survey to identify issues warranting review. Ideally,

during the latter part of the survey, a detailed planning document in draft report format is prepared to clearly identify the nature of the issues to be developed during the review and the locations to be visited. Also, plans are made to gradually increase the size of the staff so that, by the time the review starts, all staff members are on board.

A plan is developed providing for one or two teams of two or three auditors to visit each location for a period of about 1 or 2 weeks. Because each team is directed by one of the auditors who performed the survey, the learning curve is reduced and the audit program does not have to include the types of background material necessary in a typical audit. It is important, however, because of the short duration of the site visits, that the program identify as specifically as possible the data to be obtained during the visits. Of course, the fact that all team members work together in planning the review and are able to have constant face-to-face communication reduces the likelihood of misunderstandings arising among the staff as to the work to be performed.

During the review work, experience and background gained by the members of the audit teams in the survey enable them to quickly recognize, develop, and evaluate unanticipated circumstances that affect the issues being pursued. This background and experience also make it relatively easy for the two teams to communicate with each other by telephone to resolve problems. Because each team visits several sites sequentially, rather than having different teams at each site, greater assurance of consistency in data collection is obtained.

Our experience has shown that, with careful planning and preparation for the site visits, a great deal of information can be obtained in a short time. Conceptually, because the auditors doing the work are aware that they will each participate in drafting the report, they can better screen the data developed and direct it toward the proposed report than can auditors who must speculate on what material will be needed by the report drafters. Also, because the auditors know that in writing the report they, personally, will have to "live with" the data developed, their commitment to the job is assured.

When the time comes to write the report, the benefits of the fly-through method are even more apparent. Summaries can be abbreviated and directed toward those points to be included in the report. Continual contact among those drafting the report eliminates problems of interpreting working papers. Insights gained by those who did the audit work are readily available and are more likely to be reflected in the report. Problems during referencing can be resolved more easily and, if necessary, working papers can be clarified on the spot.

Review of the draft report by the Washington operating group is also facilitated because points raised during the review can be resolved directly with those who performed the work. Rather than questions and answers going from Washington to one region to another region (which no longer has the working papers) and back again, the com-

munication chain is direct—between the report reviewer and the auditor-report writer.

When Is the Fly-through Method Appropriate?

All in all, this method holds great potential for improving the efficiency with which we conduct our reviews. Caution must be used, however, in selecting assignments in which it will be used.

Obviously an assignment requiring extensive detailed scheduling of data or reviews of many individual cases would not be amenable to a fly-through procedure. Also, when the review objectives and issues to be developed are not clear at the start of the job, using this procedure would be a big mistake. It has great potential, however, for those jobs where:

—The audit team has developed a large amount of knowledge and expertise during the survey that would be difficult to impart to others.

—The potential findings have been clearly identified and well documented at one or two locations during the survey.

—The issues involve obtaining a proportionately large amount of interview evidence with readily available supporting documentation.

—The primary purpose of the review is to demonstrate, on a national scale, the existence or nonexistence of the potential finding.

Use of the fly-through procedure presupposes the "shopping list" method of conducting a detailed review rather than the "impulse buying" method. Consider as an analogy the alternative methods available for shopping at a supermarket. One is to review your available food supply, determine your specific needs, prepare a shopping list, and purchase only the items on the list. The other is to wander up and down the aisles picking everything that looks good.

Both methods are effective in that you obtain a supply of food to eat. It has been proven, however, that using a shopping list is much more efficient and less costly. Similarly, in our audit work, once the survey has been completed, our impulse buying should be over and we should be able to prepare a shopping list (audit program) that clearly shows what we want to report, what evidence we already have, and what additional evidence we need to support the proposed report. It is when we attain this position during our surveys that we are most likely to be able to use the fly-through method effectively. Needless to say, our staff is not precluded from occasionally picking up an item that is not on the list.

Another important factor in making the procedure work is the staff's commitment to using it. In the Seattle region, we never direct that this approach be used. Rather, we attempt to create an environment in which, if the audit team wants to use it and can demonstrate its appropriateness, they are encouraged to do so.

Fly-throughs are hard on the staff because of the travel involved. Although in some cases the percentage of

travel during the job is no greater than on our more typical jobs involving out-of-town audit sites, the distances involved are greater and there may be less opportunity to get home on weekends. This problem is compensated for to some extent, however, because job planning and report writing can be done in the region, making the travel demands sporadic rather than constant. Perhaps of greater significance is the fact that the opportunity for total participation in the job by all staff members, from planning to doing to report writing, provides a motivating force which creates a strong team environment and results in a high degree of job satisfaction.

How Has It Worked?

How do we know it works? Let's look at an example involving a review of the activities of Federal regional councils in four Federal regions.

This assignment required the audit staff to develop an understanding of the complex relationships among the Federal regional councils, Federal agencies, and local units of government in the four regions. Because of the number of audit sites to be visited and the number of individual audit staffs required to cover these sites within a given time frame, the Seattle staff believed that substantial time could be saved by using the fly-through approach in performing the review.

The review required 6 months of field time and a total of 12 months through issuance of the report (B–178319, Jan. 31, 1974). The report contained several recommendations, endorsed by the Office of Management and Budget, for improving the effectiveness of the regional councils and was the subject of testimony by the Comptroller General before the Subcommittee on Intergovernmental Relations, House Committee on Government Operations.

Other areas in which the fly-through approach has been used successfully involve broad-based reviews of the activities of the Law Enforcement Assistance Administration and Federal programs to assist in educating the handicapped. Each of these reviews involved broad geographical coverage, yet the scope of audit coverage was adaptable to the method.

Conclusion

As major issues come and go with ever-increasing rapidity and the Federal Government responds with more rapid changes in organizations and programs, the need for GAO reviews to be conducted faster with quicker communication of results grows more urgent. To meet this need we must constantly consider new methods of improving our efficiency. One such method is the fly-through approach to auditing, whereby an audit team based at one location plans the job together, goes where the action is to get the job done, and reassembles to write the report.

Our ability to do jobs in this manner is in its early stages of development, and as we continue to experiment, we hope to be able to improve our capabilities dramatically. The important point is for we in GAO to cre-

ate an environment in which innovative approaches to doing our job are supported and encouraged at all levels so that the highly capable people we employ will have the opportunity to contribute to GAO's objectives to the maximum extent possible.

A Manager's Oath

I will do all I can to help the organization achieve its goals.
I will set my goals and be ready to pay the price for them.
I will plan my work and work my plan.
I will spend my time on things that really matter.
I will make tough decisions without passing the buck.
I will help my men to grow by giving them responsibility and authority to act.
I will encourage initiative and give credit for jobs well done.
I will strive to establish and maintain good relations with others.
I will get things done regardless of who gets the credit.
I will listen to my men as well as talk to them.
I will be as pleasant to my subordinates as I am to my boss.
I will try to keep on growing.

Dr. Charles C. Gibbons
Administrative Consultant
Office of the President
of the Upjohn Company
Kalamazoo, Michigan
Michigan Business Review
January 1972

A. L. PATTERSON

Taking Inventory With a Camera

How do you inventory 30 acres of coal? You can do it with a camera, but then the auditor must get acquainted with the z dimension.

In the diverse assignments to which they are exposed, GAO staff members frequently encounter techniques outside the usual experience of the auditing profession. An interesting example is a device used by the Tennessee Valley Authority to take coal inventories.

TVA has 12 coal-fired power-generating plants which burn about 35 million tons of coal a year. Coal inventories are in enormous piles resting on foot-thick settlement slabs of reinforced concrete. Some of these piles cover 25 to 30 acres and are from 60 to 80 feet high.

The problem is: How do you take a physical inventory of such a huge mass of coal?

The Traditional Way

TVA's original inventory procedure was to compute the volume of the coal piles by using traditional transverse cross section techniques: (1) field surveyors took cross sections, (2) draftsmen prepared plane table topographical maps, and (3) the volume of each "slice" of each coal pile was manually computed.

Use of this traditional technique required from 3 to 4 weeks for each coal pile and became less and less practical as the piles grew to their present dimensions.

In the 1950s, TVA acquired a device called a Kelsh plotter, and, in 1967, it was combined with a computer to produce TVA's present technique of taking coal inventories with a camera.

Photographing the Coal

Every April, TVA photographs its coal piles from the air. Before photographs are taken, the position of the settlement slabs and their elevation is accurately determined, and the base area of each pile is mapped on a scale of 1″:50′. The airplane containing the camera flies over the pile at a prescribed altitude, usually about 1,500 feet above ground level, to fit the photograph to the scale of the base map.

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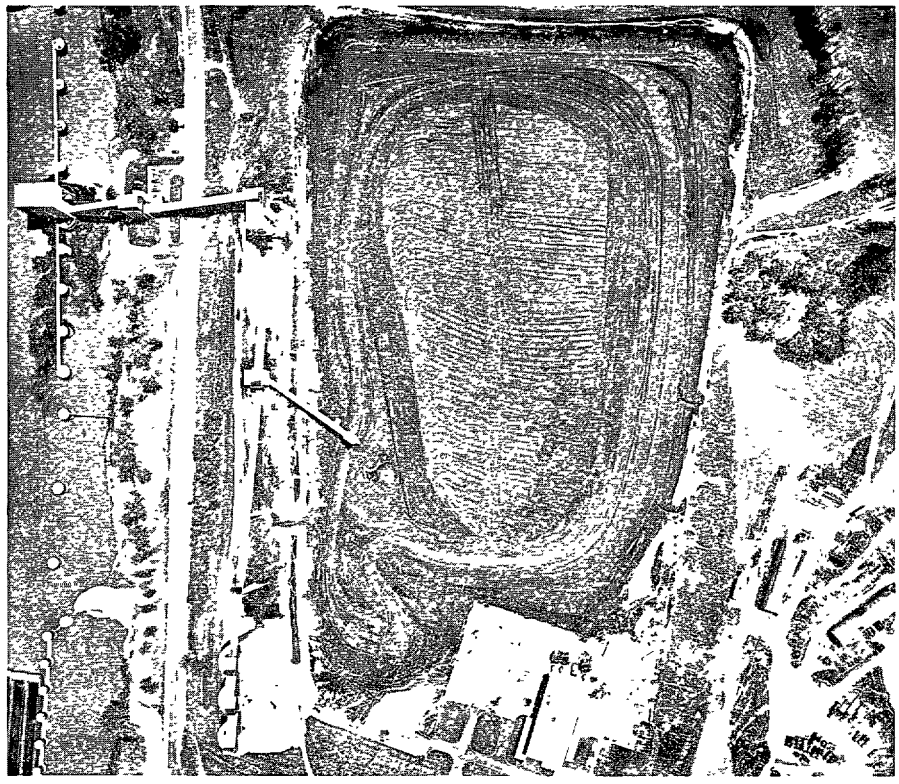


TVA coal pile at Cumberland, Tennessee. Aerial photograph taken for the Kelsh plotter.

Photographs of the coal piles in effect become two-dimensional models of the coal inventory.

Adding a Third Dimension

The most sophisticated part of TVA's technique is to convert these two-dimensional photographs into an accurate computation of the volume of coal in its huge three-dimensional piles.

This is done with the Kelsh plotter and a computer about a month after the photographs are taken. The plotter is a special machine which "reads" the photograph three dimensionally and permits computation of the area of the coal piles. In combination with the computer, it runs a cross section or profile on the photograph, just as surveyors and draftsmen would on an actual coal pile.

The x, y, and z coordinates for computing the area of each cross section are obtained as follows:

—X is fixed. It comes from a chart of the base area of the coal pile.

—Y is from a device (called the land mine, from its appearance) which is moved over the surface of the chart on which the photograph has been superimposed and which

picks up the y dimension from the line on which it is moved.

—Z comes from stereoscopic equipment built into the plotter. This equipment permits viewing of the photograph in the third (z) dimension and actually scales that dimension. By raising and lowering the plotter, the z dimension can be read.

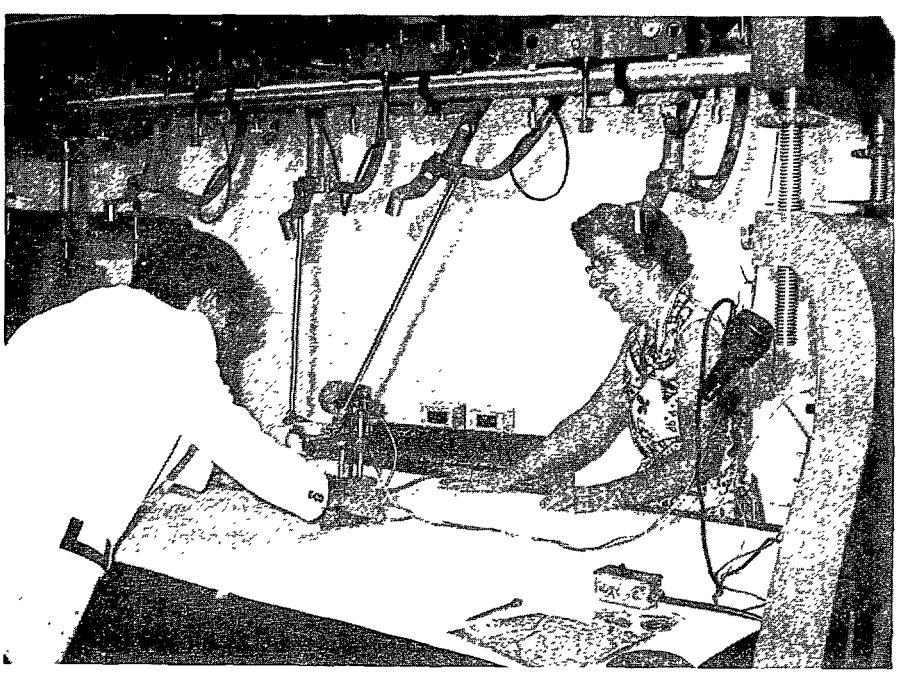
The actual computation of the coal pile's area is the summation of the series of cross sections which define the shape of the pile. The readings from each position on line and the elevation of each point is read from the plotter into the computer, where the volume of the cross sections is calculated.

Auditing the Technique

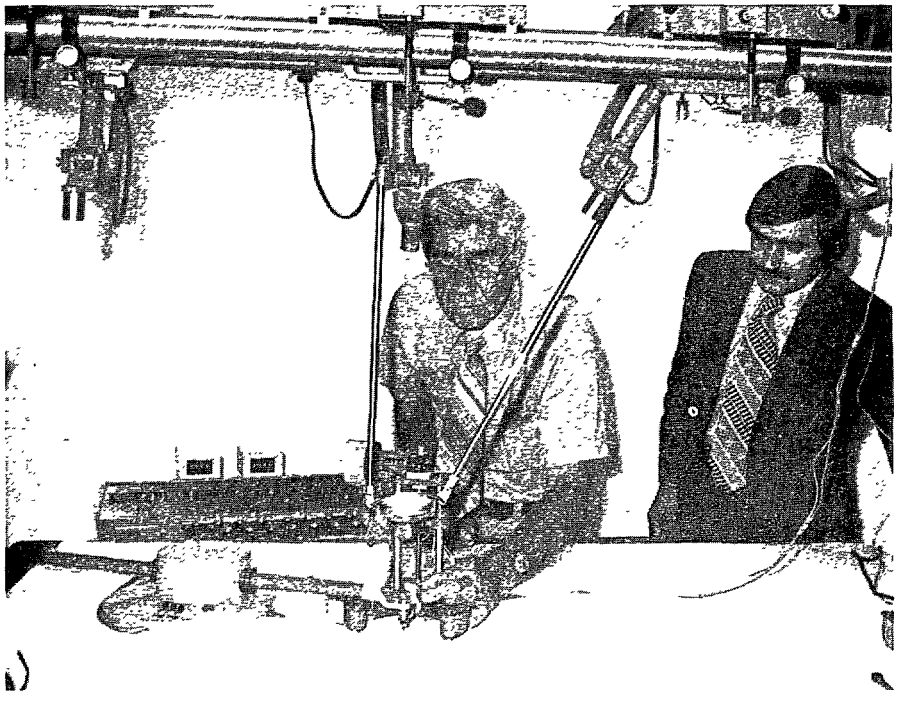
The basic problem remains: How do you best take physical inventory of such a huge mass of coal?

Auditors have a tendency to stick with tried and true methods of verification. However, when faced with problems of great magnitude and complexity, they necessarily adapt to new, sophisticated techniques. In the case of the TVA coal inventory, the auditor is easily convinced that volumetric calculation beats shoveling all that coal in an attempt to count or weigh it piece by piece.

The Kelsh plotter provides an efficient means of making the volumetric



Gary Shuford of GAO checks the y dimension while TVA's Louise Edwards looks on.



Jim Campbell of GAO observes as TVA technician Jesse Martin operates the Kelsh plotter.

calculation (it takes only about 5 minutes of computer time to calculate the volumes of all TVA's coal piles). It is probably as accurate, or even more so, as other available means of computing the volume (e.g., by traditional field survey and computation).

Is it accurate enough? In the past, internal auditors, TVA's independent public accountant, and GAO have all concluded that it is. Each year auditors check the computations, even the target elevations for the photographs, and observe the procedures involved. Generally, they have found that computed physical inventories have varied from book inventories (independently maintained) by no more than 2 percent.

However, the procedure is not without problems. An important key to the accuracy of the method is the factor by which volume is converted to pounds. TVA calculates an average weight of 70 to 72 pounds per cubic foot of coal. This is a critical assumption and one to which the auditor must direct his attention because, in masses the size of these huge coal piles, the settlement of the coal becomes a significant variable. Six inches of settlement represents a lot of tonnage. Piles are compacted and smoothed (by trucks driving over them) before they are photographed for inventory, and the piles are probed to test subsidence during the year. The auditor must assure himself that these and other controls have been properly applied.

The lesson to be learned from this kind of inventory problem seems to be: Whenever the auditor is faced with any innovative and sophisticated form of measurement he must become sophisticated in his approach to it, but he must also apply the simpler tests and checks traditional to his profession.

Tyranny of the Urgent

Urgency engulfs the manager; yet the most urgent task is not always the most important. The tyranny of the urgent lies in its distortion of priorities—its subtle cloaking of minor projects with major status, often under the guise of "crisis." One of the measures of a manager is his ability to distinguish the important from the urgent, to refuse to be tyrannized by the urgent, to refuse to manage by crisis.

R. Alex Mackenzie
in The Time Trap

TIMOTHY D. DESMOND

The Case For Footnotes in GAO Reports

Should GAO reports include footnotes for citing readily accessible documents used as important sources of information in developing findings, conclusions, and recommendations?

Footnoting accessible source documents in GAO reports may not have been necessary in the past because a traditional audit report is widely held to stand on its own. As professional auditors, inside the Government or out, we must be internally satisfied with the facts, figures, and statements in our product. Great care is exercised in assembling the data, referencing it, and wringing out the report for publication. There is therefore little need for conventional footnoting in straightforward, factual audit reports (although if a key source document is mentioned the citation should be complete enough to enable an interested reader to identify it).

Audits on an unusual terrain, in an expanding technology, addressing a complex subject, or evaluating program results often require considerable sifting of source information because the criteria are complex, ambiguous, or nonexistent; even the "facts" are often elusive or at best debatable. Complex audits, economic studies, and program evaluations—the kinds of assignments expanding on our agenda—require wide study of documents, journals, and texts from a variety of often conflicting viewpoints.[1] Not many things are hard and fast in these assignments. Therefore, the sources that shape our findings and recommendations should be identified to help the reader understand our course. (Our sister agency, the Library of Congress Congressional Research Service, does a very good job in referencing its reports to the Congress.)

Need For Footnotes

Congressional aides, agency staffs,

[1] See, for example, "On Doing Your Homework," *The GAO Review*, Winter 1974, pp. 55 to 63.

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researchers, and scholars who have more than a passing interest in our reports would be well served if we adequately footnoted accessible source documents on our pages. For one thing, some in this audience may want to check our statements for themselves. Some readers are "from Missouri," as it were; we enjoy no "automatic" credibility in our new assignment areas. For another thing, diligent researchers may wish to reconstruct our choice of inferences and findings and to sift our thinking, which they should be free to do. Finally, some may wish to pursue the report topic or a subtopic further, and a list of relevant source documents is a helpful courtesy.

By not footnoting, we may be inadvertently underestimating the utility of the reports to a valued audience. Although our reports are intended primarily for the Congress, GAO is a national asset; it serves many influential bodies. Those reports, especially, that deal with larger issues are being distributed more widely than many of us may realize to research organizations, universities, agencies, and independent students of governmental processes. The reports would be even more valuable and their import might disseminate further if we disclosed our source documents whenever practical; meticulous researchers may not esteem so well those reports which lack the "professional apparatus" of footnotes and bibliographies.

Retrieval Problems For Our Readers

A problem for our audience is that some GAO reports which do cite source documents identify them incompletely. We say, for example, "A 1973 Air Force study stated that * * *," but a number of Air Force components published scores of reports in 1973. Such a citation would exercise the most tenacious researcher to find the correct document. A better practice would be to give complete information in a conventional footnote, for example:

> Department of the Air Force, *Concept to Operations for a Tactical Airborne Warning and Control System (TAWACS)* (Langley AFB, Va.: Headquarters, Tactical Air Command, Sept. 10, 1973), p. 13.

Footnoting requires little or no additional report preparation time; in fact, overall time may be saved, since the report otherwise has to be indexed to the source documents for the referencer in a separate step, often requiring a week or more of report-processing time.

What To Footnote

Adequate footnoting cites the original sources of items likely to interest readers. Footnotes include direct quotations, of course, but equally important are the derivations for uncommon facts, unusual figures or amounts, obscure or generally forgotten events, disputable dates, definitions, inferences, and other statements about which thoughtful readers would want more evidence.[2] (See figs. 1 through 7.)

[2] If the item of interest in one of *our* sources is referenced to still another source, we seek out that original document in our review as a matter of course. This is the way an assiduous reader of our reports, as mentioned earlier, might want to verify our statement too.

Fig. 1 Citing some unusual numbers

Mr. Albert Shapero * * * reports that the French Mirage—3 fighter aircraft went from contract award to first flight in only 13 months using 55 engineers, 50 draftsmen, and 95 shop people. Mr. Shapero opines that an American company would probably use more than 200 people just to prepare the proposal for such an aircraft.

Albert Shapero, "Life Styles of Engineering," *Space/Aeronautics*, March 1969, p. 59.

Fig. 2 Citing an obscure date

The history of the Sidewinder Missile began in 1947 with a Naval Ordnance Test Station survey of air-to-air homing devices.

Thomas A. Marschak, Thomas K. Glenn, Jr., and Robert Summers, *Strategy for R&D: Studies in the Microeconomics of Development* (New York: Springer-Verlag, 1967), p. 130.

Fig. 3 Citing an agency regulation

Acquisition programs will be so structured that at least an initial phase of operational test and evaluation (I/OT&E) will be accomplished prior to first major production decision * * *.

Department of Defense Directive 5000.3 (Washington: Office of the Secretary of Defense, Jan. 19, 1973), p. 4.

Fig. 4 Crediting the research of others

A Rand Corporation estimate suggests that prototyping costs are likely to be in the range of 5 percent to 8 percent of the first 500 airframes.

Burton H. Klein, Thomas K. Glennan, Jr., and George H. Shubert, *The Role of Prototypes in Development*, RM-3467-PR (Santa Monica, Calif.: The Rand Corporation, February 1963), p. 7.

Fig. 5 Crediting an original or at least a provocative idea

A healthy rivalry in exploratory and advanced development [between the military services in the acquisition of major weapon systems to meet a common need] stopping short of parallel procurement, coupled with controlled test and evaluation should form a useful system for management weapon acquisitions.

The Comptroller General of the United States, *Actions Needed to Reduce the Proliferations of Tactical Air-to-Ground Missiles*, B-160212 (Washington: The General Accounting Office, Dec. 31, 1970), p. 65.

Fig. 6 Citing a former director of Defense Research and Engineering

We realized several years before SNARK [an air-breathing guided missile] became operational that it would become obsolete by the time it was finally deployed, and repeated recommendations for dropping the project were made. However, in this case as so many others, the momentum of the project and the politics which surround it made it impossible to do so.

Herbert York, *Race to Oblivion: A Participant's View of the Arms Race* (New York: Simon N. Schuster, 1970), p. 80.

Fig. 7 Citing a definition

* * * a major system to be procured by the Federal Government is a collection of interrelated parts that combine to perform a specific function to meet a national need. A system acquisition program is a special kind of problemsolving process that responds to a Federal need by collecting and applying the relevant products of technology. The system that results is of such high cost and complexity that it warrants special management attention.

Report of the Commission on Government Procurement, Vol. 2 (Washington: Government Printing Office, December 1972), p. 90.

Some of these items of interest may have been quite difficult for the original researcher to dig out or put together. (See figs. 1 and 4.) Another source may have an innovative viewpoint or an original interpretation. (See fig. 5.) They "own" the information, as it were. When we cite these sources we give due and proper credit to others for their original work and ideas; avoiding even a breath of plagiarism is another good reason for footnoting.

Confidential GAO documents and those that might affect pending litigation should not be listed. Internal agency documents that are inaccessible to any outsiders should probably not be cited. Classified documents, however, may be footnoted for access by those readers with the necessary security clearance.

Footnotes which amplify the text or are asides to the reader (you will note several in this article) can be left to the discretion of writers, with the admonition, however, not to overdo.

Additionally, our findings and recommendations can sometimes be buttressed by citing other documents in which public figures (see fig. 6), distinguished authors, and respected research organizations concur in whole or part with us. There are, of course, other reports of the Comptroller General himself to use for support, too. (See fig. 5.) (In this writer's opinion, citing one GAO report in another when the topics overlap could be done more often if report topics and subtopics were indexed for computer retrieval. All reports dealing with a subject at hand could be called out. Cross-referencing of GAO reports would then have the virtue of showing precedents for positions taken and would demonstrate Office-wide unanimity on related issues.)

Footnote Placement

Footnotes may be inserted at the bottom of the page or appended to the report in one listing—it is a matter of choice or institutional preference. Footnotes at the bottom of the page are most convenient to the more studious reader. Citations in an appendix, on the other hand, would be least distracting to readers not interested in sources. As an appendix, too, the notes might replace the bibliography that would otherwise be listed at the end of reports which have footnoted pages.

Another institutional preference is the method of numbering footnotes. The number series can start over on each page or in each chapter; they can also run consecutively through the report. "Bookkeeping" the numbers is easiest when they begin anew on each page, but serializing the footnote numbers for each chapter appears to be the choice of the better known publishers.

Footnote Styles

The styles of footnoting vary somewhat among publishing houses, university presses, and research organizations (the "Government Style Manual" expresses no preference). The variations are minor, however; they deal mostly with punctuation, the manner in which uncommon documents are cited, or

how successive references to the same document are made. The various styles used, however, agree on the essential retrieval information. Texts, for example, are usually footnoted by the author's name, full title of the work, name and city of the publisher, date of publication, and the page number of the item referenced. (Only the author's name, title of the work, and page number is necessary in the footnote if the full "address" is in the bibliography.) Reports of governmental agencies and research organizations are often given code numbers and these numbers should appear in footnotes. (See figs. 5 and 6.) The important thing is to help the interested reader retrieve the document quickly and easily.

A rather complete guide to footnotes and bibliographies is in "A Manual of Style," 12th ed. (The University of Chicago Press, 1969). A widely used short version which many of us will remember from college days is Kate L. Turabian's "A Manual for Writers of Term Papers, Theses, and Dissertations," 3d ed., rev., Phoenix Books (The University of Chicago Press, 1967). Both works deal with legal citations and scientific notation as well.

Don't Overdo

Footnotes, as with all good things, should be used in moderation. There is no need to cite sources for commonly known facts, statements which are readily acceptable on their face, or inferences which are patently logical. The reader's patience should not be taxed with a multitude of footnotes.

A few writers take to footnoting like strong drink, not knowing when to stop. They cannot resist cluttering up their pages with copious footnotes, citing sources unnecessarily, and presenting numerous amplifications and asides which tax the reader more than they benefit him.

> This abuse should be avoided, for, as one humorous objector pointed out, 'it is quite a chore to keep focusing up and down the page, especially if you have old eyes or a touch of astigmatism.'[3]

How Many Footnotes?

The potential value of the footnoted citations to the serious (and skeptical) readers should be the clue as to how many footnotes should appear in a report. As a rough guide, there is 1 footnote for every 500 to 600 words of text in some publications of the Harvard University Press and the Brookings Institution. Reports of the Library of Congress Congressional Research Service average 1 footnote for each 300 words. Given the stature of GAO we should probably lean toward a low ratio. In any case, the number of footnotes should be sufficient to satisfy the alert reader.

A Bibliography Can Be Added Help

If it is necessary to use more than a dozen footnotes, it is the convention to list the source documents again in an appendix. Entitled "Selected Bibliogra-

[3] Jacques Barzun and Henry F. Graf, *The Modern Researcher*, Harbinger Books (New York: Harcourt, Brace, and World, Inc., 1962), p. 310.

phy" (since it is seldom all-inclusive on the subject), the list may be arranged alphabetically by author or in categories such as "Texts," "Journals," "Public Documents," "Classified Materials," etc. Any logical arrangement of the source document listing will do. The bibliography is a special convenience to researchers who may wish to pursue the topic or subtopics further.

Then too, bibliographies in GAO reports could be a bonus to GAO auditors who begin a new review of a previous report topic or an overlapping one. The scope of the previous reports can be evaluated by scanning their bibliographies, leads to promising lines of inquiry can be noted, and the new reviewers can probably avoid digging through reams of working papers, many of which may no longer be germane.

While we shall continue to satisfy ourselves that GAO products are accurate, we can enhance the value of our reports by appropriately displaying source documents in conventional footnoting. There may be another benefit, too: while demonstrating the scope of our work is not a terribly important reason, adequate footnoting gives some idea of the depth and breadth of our study. Mainly though, we will help our thoughtful readers and perhaps clothe our findings with yet more credibility:

> [Footnotes] form the main part of the 'apparatus' which is said to distinguish a 'work of scholarship' from a 'popular work.' They give us confidence in the book that displays them by announcing to the world that the text is open to anyone's verification. They declare in their way that the author is intellectually honest: he acknowledges his debts; and that he is democratically unassuming: the first comer can challenge him. [4]

[4] *Ibid.*, p. 311.

So long as men praise you, you can only be sure that you are not yet on your own true path but on someone else's.

Friedrich Nietzsche

NANDER BROWN AND PAUL COX

Auditing Payroll Systems—A Coming of Age

Computerized payroll systems call for more sophisticated audit techniques. The authors here describe how they perform an audit for the payrolls of a major Federal agency.

Traditional GAO payroll audits have been concerned with the financial and compliance aspects of payroll operations. Primary objectives were to determine whether

—payroll operations were properly conducted,

—payroll reports were presented accurately, and

—payroll organizations had complied with applicable laws and regulations.

This type of audit was also characterized by its singular approach, repetitiveness, and requirement for detailed examination of numerical data. The lack of challenge and versatility made this type of audit unattractive to many GAO auditors. The bookkeeper perched on a high chair wearing a green eyeshade was the image many perceived.

During the late 1960s and early 1970s the automation of the payroll was one of the first accounting applications converted to computer processing. The computer, with its speed and versatility, offered two significant benefits that made payroll a logical choice for automation. These benefits were that payroll processing was speeded up and the per-employee cost of producing the payroll was reduced.

Despite these benefits, inherent problems surfaced with the automated payroll. These problems, which interfered with GAO's traditional payroll audit approach, included:

—Too much responsibility and control concentrated in the ADP segment of the system.

—Use of reliable manual controls that were relaxed or ineffective

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Mr. Cox is an auditor with the Cincinnati regional office. He is a graduate of Indiana University with a B.S. degree in accounting. He is a CPA candidate in Ohio and a graduate of the Wharton-GAO Management Information Systems Program.

with a computer operation.
—Lack of a visible audit trail.
—Errors that became more elusive and difficult to detect.
—Transaction and program documentation that was difficult to acquire and in some cases nonexistent.

Recognizing these as significant problems, GAO considered it necessary to change its method of auditing automated payroll systems.

GAO's current approach to auditing automated payrolls is called the systems approach. The systems approach provides for an examination of all the related subsystems of a payroll system and their interrelationships. This approach includes a study of the segments of the data processing department, the internal audit activities, and payroll administration. Such a comprehensive audit includes an evaluation of the administrative practices as well as an audit of payroll transactions.

This approach is in harmony with the GAO "Standards for Audit of Government Organizations, Programs, Activities, and Functions." Under these standards, Government auditors must not only consider financial and compliance aspects but also the effectiveness and efficiency of an agency's operation.

In the Cincinnati region, we first applied the systems approach during our evaluation of the computerized civilian payroll system of the Defense Supply Agency (DSA). We made the evaluation in two phases—at the system design center in Columbus, Ohio, and at three field installations that processed their civilian payrolls using the centrally designed system.

DSA's computerized payroll system is a major subsystem of its automated payroll, cost, and personnel system (APCAPS). The payroll subsystem became operational in May 1970. As of June 30, 1973, about 37,000 employees, whose annual gross earnings totaled about $400 million, were being paid through the automated payroll system by 9 processing activities.

Techniques Used

To assist us in testing the automated controls associated with APCAPS, we prepared and processed a test deck using actual payroll programs and a computerized audit retrieval program that obtained for audit specifically selected items of data from actual computerized files. In addition, we used a simulation program to illustrate the monetary effects of our findings on program-processing efficiency. A discussion of the techniques follows.

Test decks are sets of dummy or simulated data inputs created to test the procedures and controls in a computer program. This allows the auditor to check the accuracy and logical functions of a computer program.

Audit retrieval programs are capable of selecting and extracting specific data for examination, comparatively analyzing data, verifying arithmetic computation, stratifying accounts or data, and identifying unusual transactions.

Simulation is a management science technique that involves the study of operational problems in which the computer is used to simulate a certain process or system. The objective is to subject the problem to a series of assump-

tions and manipulations to find one or more acceptable solutions.

The chart on the following page shows the various computerized retrieval steps necessary to carry out our audit.

The Findings

By using test decks, computerized audit retrieval programs, and simulation programs, as well as normal payroll audit techniques, we were able to develop findings involving internal controls and the efficiency and effectiveness of the overall system's design. The systems approach used to evaluate efficiency and effectiveness allowed us to develop significant dollar findings and to gain the confidence of the agency's design personnel by clearly demonstrating design deficiencies.

Internal Controls

We found a number of weaknesses in the internal controls exercised over certain aspects of the APCAPS payroll subsystems. Most of these weaknesses were caused by (1) inadequate supervisory review of unusual and abnormal transactions and (2) failure to maintain current lists of error message explanations. These weaknesses resulted in errors in the pay and leave records of many DSA employees.

For example, we noted one instance when an employee was paid $25,161.60 for a biweekly pay period, even though the APCAPS program limitation for a biweekly pay period was $1,344.80. This situation occurred when a payroll clerk bypassed the programed control because the payment required manual intervention and made an erroneous pay calculation. The overpayment was not detected until the employee reported it to the Payroll Office.

The transaction was not reviewed by supervisory personnel to insure that only correct and authorized data had entered the system for processing. When we discussed this with supervisory personnel, they said that the only way they could have detected the error would have been to review every transaction entering the system because they did not receive a separate list of those transactions which bypassed some programed control.

We suggested that a separate list of such transactions could be prepared and issued to payroll supervisors before the checks were issued. On a quarterly basis the information could be sent to the comptroller and internal audit staffs to permit additional supervision and control of this area of payroll processing. A flowchart of our suggestion is on page 47.

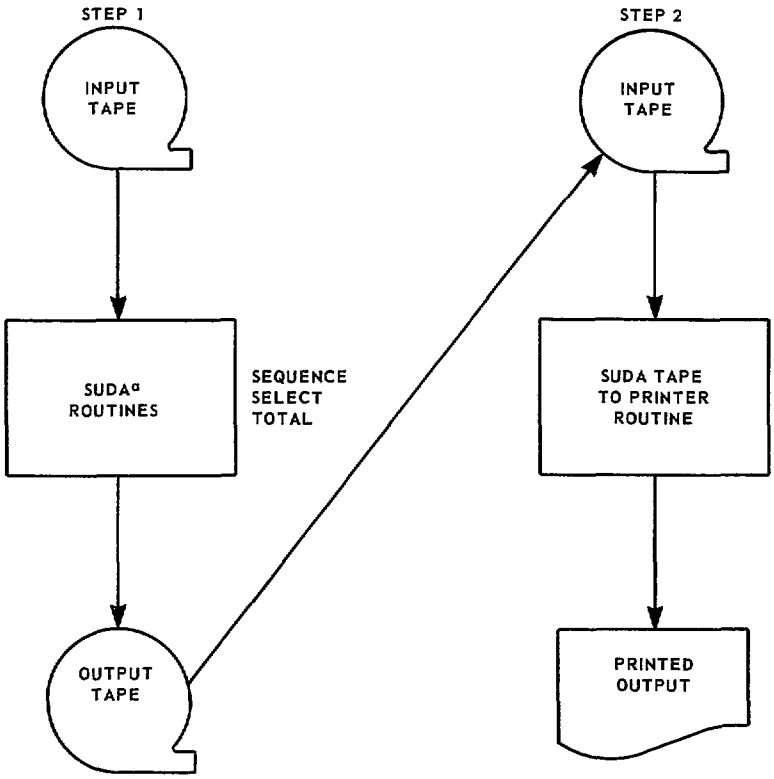
DSA management personnel advised us that improved supervisory review of these kinds of transactions was necessary and moved swiftly to provide their management personnel with the list described above.

Computer Program Inefficiencies

In sophisticated computer systems, it is important that the computer programs be designed to provide for the efficient production of accurate and acceptable output. The computer program

AUDIT RETRIEVAL STEPS PERFORMED IN AUDITING APCAPS

GENERAL FLOWCHART:

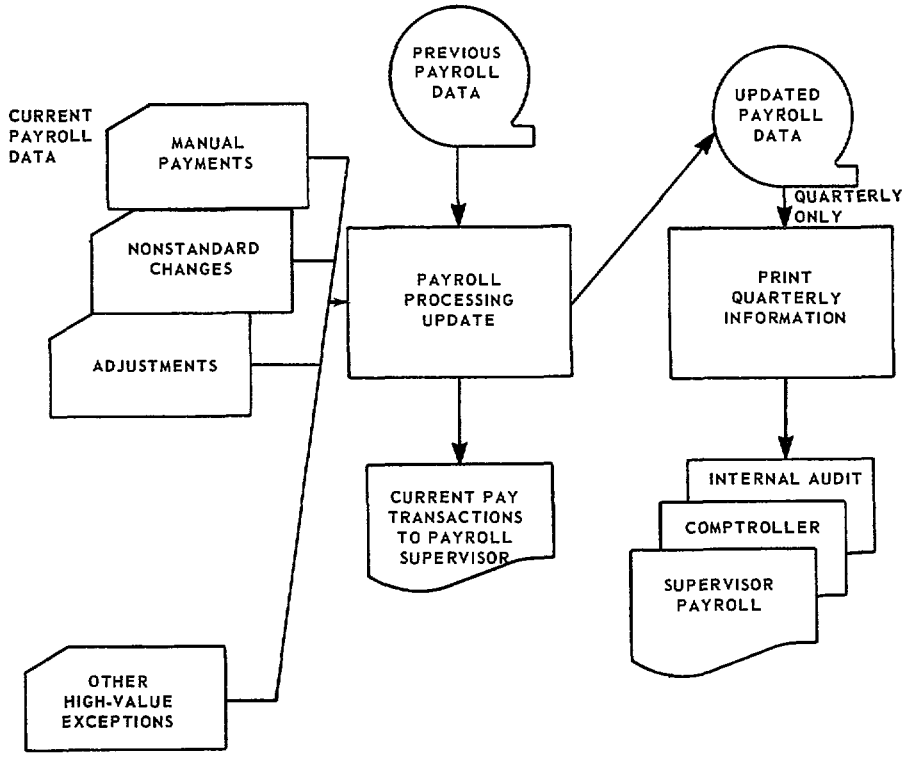


JOBS DONE:

1. CHECKED FOR DUPLICATE EMPLOYEE RECORDS.
2. SELECTED RECORDS WITH ZERO GROSS PAY YEAR-TO-DATE BALANCE.
3. SELECTED RECORDS WITH MILITARY ANNUAL LEAVE $\geq$ 120 HOURS.
4. SELECTED RECORDS WITH SERVICE COMPUTATION DATES BEFORE 1959.
5. SELECTED ALL INSTALLATION FIREFIGHTER RECORDS.
6. VERIFIED THE YEAREND TOTALS WHICH WERE REPORTED TO INTERNAL REVENUE SERVICE.
7. REVIEW ALL NONEDIT, MANUAL, AND ADJUSTMENT TRANSACTIONS.

[a] SUDA (standard utility for debugging on auditing) is a general audit retrieval program developed by the Cincinnati regional office ADP group.

FLOWCHART OF SUGGESTED PROCEDURE TO CAPTURE AND RECORD EXCEPTION-TYPE TRANSACTIONS



design of the leave and history files segment of the APCAPS payroll subsystem was inefficient and was causing excessive computer processing at user activities.

At the time of our review, the computer program design of the leave and pay history files segment of the APCAPS payroll subsystem required adding a new leave and pay history record for each pay period to the leave and pay history file for each employee paid. This process caused the computer processing time to increase significantly throughout the year because of the continual accumulation of records in the file. The leave and pay history files were maintained in this manner because of a requirement to keep a full year's history for inquiry and adjustment purposes.

We thought this situation was very inefficient, and we learned that the users of the information did not need a complete reprinting of the information every time they received it. Because we had no idea of the monetary value of changing the current processing concept of the computer programs, we decided to write a computer pro-

gram to simulate the computer processing environment of the applicable APCAPS program.

After satisfying ourselves that our program properly simulated the APCAPS environment, we simulated many payroll processing cycles. We were able to establish the computer processing time that could be saved, and DSA officials subsequently revised the computer program to carry forward only the year-to-date summary totals to the next quarter instead of all the previous pay period transactions. They agreed that the estimated annual savings for the nine APCAPS processing activities would be about $30,000.

Decentralization Is Costing DSA Money

To achieve effectiveness and efficiency from automated data processing systems, many organizations have centralized the functional support, design, programing functions, and computer operations of their automated data processing systems.

Because of the current APCAPS decentralized computer operations concept, DSA has not been able to achieve economies that would be available under centralized computer operation. Duplicate technical duties and duplicate computer operations were being carried out at each location. Also, the decentralized process has resulted in the use of inefficient programing techniques and could necessitate significant reprograming effort when APCAPS is expanded to 19 user activities as planned by DSA.

Our study of this area revealed that existing state-of-the-art remote computer terminals and communication equipment and techniques would allow DSA to process APCAPS for all employees at one of the existing user activities. The schedule shows the savings and offsetting costs that we considered in our study regarding the feasibility of centralizing the APCAPS data processing operation.

The amounts shown in the schedule do not include any savings resulting from the increased design efficiencies,

Preliminary APCAPS Centralization Cost-Benefit Summary

	Number of processing sites	
Summary results	*9 in operation FY 1972*	*19 proposed FY 1975*
Savings factor:		
Reduction of personnel costs	$ 256,000	$ 608,000
Released computer processing time	799,000	1,331,500
Gross savings	1,055,000	1,939,500
Less additional costs:		
Computer operations and computer equipment	279,500	574,500
Increased computer processing time	290,500	373,500
Total additional costs	570,000	948,000
Net savings	$ 485,000	$ 991,500

the elimination of additional programing efforts, or the reduction of data processing operations to be realized when the personnel subsystem is placed in operation at all 19 sites.

The primary mission of the DSA activities currently processing APCAPS is to fulfill DSA's supply and logistics requirements. We believe that if APCAPS were processed centrally, valuable computer time would be freed for support of other mission functions and DSA activities could avoid or postpone the procurement of additional computer processing equipment.

Furthermore, centralization of the APCAPS data processing operation would permit system design personnel to take advantage of more efficient programing techniques because they would no longer be restricted to programing for the user activity with the least amount of computer capability.

In a report to the Secretary of Defense (B–146856, July 9, 1974), we recommended that DSA undertake a detailed feasibility study to determine the cost-benefit relationship of processing APCAPS at a central processing site. Agency officials agreed that duplication exists in the present decentralized system and have begun the recommended feasibility study.

Conclusion

The major advantage of using computers for audit purposes is that the auditor gains the capability to extend audit tests far beyond simple financial verification and acquires analytical results that are irrefutable. Further, he gains the ability to address computer files directly, to access data, and to prepare reports as required by a given audit program. Specifically, some of the benefits that the auditor gains by using the systems approach are:

—A more comprehensive review.
—The ability to use the computer to test internal controls.
—The opportunity to concentrate on known system weaknesses.
—More effective reporting with less man-days expended.

The findings of our review of the APCAPS payroll system clearly demonstrated the advantages of the systems approach. It would have been almost impossible to obtain such conclusive results using the traditional payroll audit approach.

As the computer assumes a more responsible role in the operation of Government agencies, the challenge of auditing in an ADP environment must be acknowledged. The auditor does not have much choice; he will be forced to audit the use of the computer and to use the computer as an audit tool. Auditors who adopt the "wait and see" attitude will find themselves trying to catch up and become part of the present because they are living in the past, clinging to old ideas and methods. It is only a matter of time.

NEAL P. CURTIN

Correspondence Courses: The Neglected Alternative

Correspondence courses as a source of professional training have taken a bum rap. While many of the criticisms are valid and must be overcome, correspondence education is nevertheless a valid and useful supplementary tool in a career development program.

"Why don't you take a *real* course instead?"

It's wise cracks like this that give correspondence courses a bad name. Of all forms of training available, none is more maligned and neglected than that obtained by mail for home study. This article will take a new look at correspondence courses and their role as a training tool in GAO. In so doing, it will assess the unique advantages and the nagging disadvantages of this type of education and will point out one good source of correspondence education within the Government.

Career Development

That a continuing program of professional training is a necessity of life in GAO has been axiomatic for years. Traditionally this training has consisted of (1) on-the-job training, (2) GAO-sponsored courses, (3) courses sponsored by other agencies, and (4) university courses. Through the proper combination of these forms of training, the GAO auditor is supposed to establish a reasonably thorough and diverse professional development program.

Unfortunately, each of the four types of training has disadvantages which hamper its effectiveness and threaten to scuttle the auditor's professional training program. On-the-job training, because it is generally task-oriented rather than conceptual, is often neither as thorough nor as effective as we would like. Agency-sponsored courses are usually few and far between for any one auditor and may present very detailed or technical material of limited practical usefulness. GAO courses are similarly infrequent and for the most part are brief introductions to technical and management areas with little time for in-depth coverage. University programs leading to a degree or pro-

Mr. Curtin, a supervisory auditor in the Chicago regional office at the time this article was written, recently transferred to the European Branch. He joined GAO in 1970 with a bachelor's degree in economics from Bradley University.

fessional certification require extensive periods of regular classroom attendance, which can be a considerable problem for the traveling field auditor.

The Role of Correspondence Courses

Correspondence courses are certainly no panacea for the serious problems confronting the training tools at the auditor's disposal, but, when used to supplement other training sources, they can effectively fill in some of the gaps left by the traditional approach. The role of correspondence courses is not to supplant other forms of education but to complement them.

In its role as a supplement and a complement, correspondence education can serve admirably in at least three capacities. First, correspondence material provides a good, handy reference for detailed information in technical areas. Secondly, a course can provide a basic overview of a subject to allow the student to pick out topics of interest for further study. Third, correspondence courses offer a chance to study a field or subject for which the student did not have time as an undergraduate.

Advantages

When viewed in these three roles, correspondence courses have several advantages over in-residence training. Perhaps the most obvious selling point is flexibility. Since there are no classes to attend and no set dates for examinations, the student can take the course at his leisure and fit it to his schedule. For the field auditor, this flexibility means that the course does not end if he gets a travel assignment. He can study at the Holiday Inn as easily as at home (maybe more easily).

In addition, correspondence schools offer a wide variety of courses, from report writing to early Chinese history to contract law. Because the courses can be taken separately, with few prerequisites, the student is not committed to any one field or curriculum.

One further advantage that may be overlooked is the usefulness of the course material for future reference. Because the courses are given without teachers, the language used in the instructions must be clear, concise, and complete—three virtues which many college textbooks lack. The material is usually well-organized and understandable.

Disadvantages

Despite the notable advantages, correspondence courses have been relegated to a second-class status because of some troublesome disadvantages. A recent GAO report on correspondence courses taken by veterans, for example, estimated that only 25 percent of those taking such courses completed them and only 6 percent satisfied their reasons for taking the courses. Any proponent of correspondence education must grapple with these problems, and this article attempts to do that.

Perhaps the most common argument against correspondence courses is that they lack (1) the personal contact and discipline afforded by a teacher and

(2) the sense of competition aroused in a classroom atmosphere. Traditionally, these are the factors that drag the student kicking and screaming across the threshold of learning. They spur the student to do his best to satisfy his teacher and impress his classmates.

Without these traditional educational forces, correspondence courses require an uncommon degree of self-discipline. A lesson can collect dust for weeks and no teacher will reprimand the recalcitrant student. Questions that arise during a lesson can easily be left unanswered and forgotten. The discipline that traditionally arises in a classroom situation must be replaced in correspondence education by self-discipline. This is not to say that guidance and authority are completely lacking in correspondence courses. Most courses encourage students to ask questions about lessons studied and provide a means of answering such questions. They also require that, once started, a course must be completed in some reasonable time period.

Far from being a disadvantage, however, the need for self-discipline should really be one of the main reasons for taking a correspondence course. Anyone who has been away from school for more than a year or two realizes how quickly the good study habits disappear and how easily professional education and development activities can be postponed. How many of us have rationalized excuses for not participating actively in a professional group this year or for not starting that MBA program this semester? Correspondence courses demand the kind of self-discipline necessary to pursue an active career development program.

Another disadvantage of correspondence courses is that they generally are not emphasized or promoted by employers—including GAO—and consequently their available sources are not widely known. Correspondence courses generally do not lead to a degree or professional certification, so the employer is inclined to place a relatively low priority on them. And since few employees are taking correspondence courses, they are not publicized much by word of mouth, either, and are virtually ignored. (It is no accident that "ignorance" is derived from "ignore".)

In a way, this article is a response to the lack of publicity afforded correspondence courses in the past. It is an attempt to point out that correspondence education is alive and well and offering a viable alternative to in-residence training, especially for the traveling auditor.

With that in mind, the author would be sadly remiss in neglecting to identify a good source of correspondence courses available at no cost to GAO auditors. One such source is—believe it or not—the Department of the Army. With 27 schools offering study material by mail, the Army is a veritable cornucopia of correspondence courses. While many (probably most) of these courses cover esoteric or highly technical areas of little interest or benefit in our work (such as "Air Defense of Oversea Land Areas" or "Army Calibration"), there are virtually dozens of courses that could prove valuable either for a specific job—such as telecommunications or ADP—or for general professional

development—such as effective writing or management.

Department of the Army Pamphlet 350–60 lists and describes all Army correspondence schools and courses. While the Finance School and the Adjutant General School provide most courses of interest to GAO auditors—including an excellent ADP systems analysis course—some of the other schools present a wealth of interesting material as well. For example, the Army Civil Affairs School offers "Funding Government Operations," the Army Engineer School offers "Mathematics and Measurement," and the Army Ordnance Center and School offers "Operations Research/Systems Analysis."

Besides the Army, other agencies—both military and civilian—offer correspondence courses. In the civil sector, for example, the Department of Agriculture and the Civil Service Commission sponsor substantial correspondence programs.

Some Advice

So, you're convinced that correspondence education might be worthwhile after all and you sign up for your first course. It is only fair that this article—which roped you into it—conclude with some tips that might help you complete the course with a minimum of pain and frustration. (It is worth noting that the author has not always observed these tips and has suffered in the process.)

1. Start the course immediately when you receive the first lesson. This helps you retain the enthusiasm you had when you first applied for the course.
2. Try to develop a study habit which reserves time each day for reading or working problems. Lack of time was one of the major causes of dropouts cited in GAO's report on veterans taking correspondence courses.
3. Don't get bogged down on one long lesson. The longer and more mind-boggling the lesson, the quicker you should try to knock it off. The difficulty of the assignments was another big reason that veterans failed to complete courses.
4. Don't be afraid to ask questions about material you don't understand.
5. Pay close attention to time limits and course requirements to avoid an embarrassing cancellation of your enrollment.
6. Remember, a correspondence course is "real," even without ivy-covered walls.

DONALD A. WILLIAMS

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Using Teamwork to Achieve GAO Objectives

The organization of GAO into divisions and numerous audit staffs makes teamwork an important element in the execution of its functions. Some of the ingredients essential in making teamwork an effective tool are discussed in this article.

"We're all one big team striving towards a common goal." "The cooperative effort of all departments will be required to achieve this objective." "Teamwork is the key to our success." Such management sermons are common to members of objective-oriented organizations. Employees of Government entities, municipalities, and private industry are periodically lectured at meetings, training seminars, and refresher courses on the importance of teamwork in achieving organization objectives. They are reminded that the objectives and day-to-day operations of their suborganizational work environment—whether a division, department, branch, etc.—must further and be in concert with the overall objectives of the organization.

Unfortunately, it appears that the principles of teamwork reiterated to employees seldom go beyond the classroom environment. All too often the reminders, like a New Year's resolution, fade into oblivion once the daily work routine is resumed. Returning to the vacuum of their suborganizational work environments, employees soon lose track of the organization's broad objectives due to an overpreoccupation with division, department, or branch objectives. This is indeed unfortunate, for the teamwork concept is vital to the success of all objective-oriented organizations, particularly those which are decentralized and have wide areas of responsibility.

It is for this reason that teamwork is especially important in GAO. In terms of areas of responsibility, there are few, if any, organizations in the public or private sector as diverse as GAO. Having the responsibility of auditing numerous Federal departments and agencies, Government contractors, and various localities receiving Federal assistance, GAO reviews a myriad of federally funded programs ranging from cost growth on major defense projects to the management of health care programs in the District of

Mr. Williams, a management auditor with the International Division, joined GAO in 1970. He holds a B.S. degree in business management from Virginia Commonwealth University and is a member of the American Society for Public Administration.

Columbia.

This monumental task is performed by a network of highly decentralized GAO units—divisions dispersed into numerous audit staffs at Government agencies which, in turn, are further subdivided into audit groups responsible for specific functional areas within an agency. Getting these GAO units to work harmoniously toward a common objective, while at the same time achieving their own objectives, is not easy. Audit resources must be effectively coordinated and channeled expeditiously into work areas to insure maximum savings and benefits to the Government and to the public as a whole. This requires the full cooperation of all GAO units.

I recently had the opportunity to participate in a bit of GAO teamwork. I had just begun my present assignment with the International Division at the beginning of the year, after completing a 2-year assignment with the General Government Division's District of Columbia Government audit staff. About a month after being rotated, I received a phone call from a friend and fellow GAO auditor I had worked with on an assignment at the National Aeronautics and Space Administration. His assignment at that time was with the Manpower and Welfare Division. He informed me that one of his friends, a teacher at a District of Columbia high school, had received his Wage and Tax Statement (W–2 form) for the 1973 tax year from the D.C. public school system and that it appeared the gross income reported was significantly understated. The teacher, who wished to remain anonymous, further informed my friend that a number of other teachers at the same school had noticed similar apparent discrepancies in their W–2 forms.

Realizing that this alleged deficiency could have District-wide ramifications and that I had just completed an assignment at the D.C. Government audit site, my friend called me concerning the allegations. I channeled the information to the D.C. Government audit site, which had auditors investigating the allegations the following day.

It turned out that the W–2 forms were not understated; they appeared so only because of a change the school system had made in the manner in which it reported teachers' incomes. However, for the purpose of my illustration, it is unimportant whether any savings resulted from our joint effort. I merely intended to show how teamwork can be used to effectively follow up on an allegation, regardless of the outcome. As a result of the cooperative effort of staff members of three separate GAO divisions, two of which had no responsibility whatsoever in the area, an allegation was promptly and efficiently resolved. The fact that an actual deficiency may have been nonexistent does not mean the teamwork effort was in vain.

This example also shows how elementary teamwork can be in practice—it can take place at any level within the organization and does not necessarily require a highly formalized system of coordination.

Teamwork Must Be Pervasive

If beneficial results are to be ob-

tained from teamwork effort within GAO, it must pervade the entire organization. As shown by our cooperative effort in pursuing the allegations relating to the W–2 forms, teamwork need not be confined to only top management use. Generally, top management officials—assistant comptrollers general, division heads, and associate and assistant directors—are more cognizant of GAO's broad objectives and of the importance of teamwork in achieving them because it is within top management that the objectives originate. These officials are also afforded more opportunities to meet, either directly or indirectly, with the Comptroller General and with each other to coordinate their efforts and to attune them to the goals of the organization as a whole.

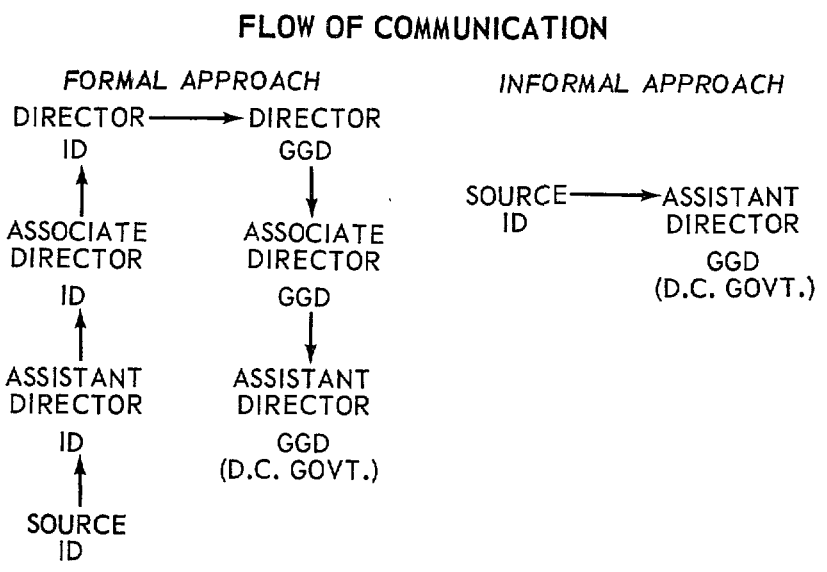
On the other hand, auditors and other professional staff members at the lower operating levels are more removed from the GAO decisionmaking processes and receive relatively little communication from outside their suborganizational work environments (except for periodic memorandums from the Comptroller General, division heads, personnel management, etc.). They are less conscious of GAO's broad objectives in performing their daily duties, and, consequently, the likelihood is greater here that the broad objectives of the organization will be overshadowed and possibly vitiated by those of the suborganizational unit. The teamwork concept, therefore, is extremely important at these lower operating levels.

As also shown by my experience with the W–2 forms case, there is no need for a highly formalized system for coordinating the efforts of GAO units which would require adherence to specific channels of communication following the chain-of-command concept. For example, it would have caused considerable delays in pursuing the case of the allegedly understated W–2 forms if, instead of going directly to the D.C. Government audit staff with the allegation, I would have been required to adhere to the chain-of-command concept in communicating the allegation to the appropriate GAO unit. Such a formal approach could conceivably have involved first communicating the allegation upward through the chain of command within the International Division to the director, then laterally to the director of the General Government Division, and finally downward through that division's chain-of-command to the D.C. Government audit staff.

The illustration on the following page compares the flow of communication under the formal approach with that under the informal approach (the one actually taken).

The illustration makes obvious the expediency of the informal approach. It accomplishes in one step what would take six steps under the formal approach. The time-consuming system of communication taking place under the formal approach would tend to discourage rather than promote the use of teamwork within GAO.

The informal approach to communicating possible deficiencies and other useful information within and between GAO units is the most expeditious. As a matter of fact, the grapevine ap-



proach is greatly facilitated by GAO's rotation policy. Auditors, during their careers with GAO, meet many other auditors as a result of periodic rotations. When these auditors keep in touch with each other, the groundwork is laid for an effective system of intradivisional as well as interdivisional communication. Although the informal system of communication has its advantages, it should be kept in mind that the gravity of the allegation at hand should dictate whether more formal channels of communication should be recognized and followed.

Obstacles to Effective Teamwork

It is ironic that, although decentralization may permit an organization to accomplish its objectives more efficiently, it also tends to impede effective teamwork. The separation of an organization into functional units may foster an allegiance on the part of employees to the aspirations of the decentralized unit that may exceed their allegiance to the aspirations of the organization as a whole. Within GAO, this allegiance manifests itself in the concern expressed by members of GAO units that their audit areas are not infringed upon by other units. Indeed, during my 4 years with GAO, I have heard the concern of someone else "stealing our work area" expressed by division heads, assistant directors, audit managers, and others. The underlying cause of this concern more than likely is worry about "the other guy getting all the glory" or, more close to home, the accomplishment report.

Although detrimental to effective teamwork, the protective attitudes adopted by members of GAO units are understandable to an extent. GAO is responsible for keeping a watchful eye on a multitude of Federal departments and agencies, some of which have over-

lapping functions and responsibilities. There may also be a degree of redundancy in the programs or projects within a given department or agency. Therefore it is only logical that the auditing responsibilities of GAO units assigned to these departments and agencies will overlap occasionally.

In addition, every GAO unit—whether a division, site audit staff, or work group within a staff—must, and rightly so, show to its organizational superior concrete achievements resulting from its audit efforts. Achievements can be in the form of issued reports, accomplishment reports, or exceptional assistance provided to the Congress, to mention only a few. The combination of overlapping auditing responsibilities with other units and the overwhelming necessity to prove the satisfactory or superior performance of the work unit has, no doubt, led to the protective attitudes adopted by GAO units with respect to their work areas.

These attitudes have a negative effect on teamwork effort within GAO and consequently hinder the accomplishment of the organization's broad goals. It is not at all difficult for members of a suborganizational work environment to become so engrossed with the operations and aspirations of their own little "empire" that they forget they are a part of a larger entity with even broader and more important aspirations. When this happens, the overall objectives of the organization may suffer.

The most desired relationship between organization goals and those of the suborganizational unit can best be explained by defining teamwork—"work done by a number of associates each doing a part but all subordinating personal prominence to the efficiency of the whole." This is not intended to mean the work of the suborganizational unit is not important. On the contrary, it is highly essential, for it is through the collective efforts of all suborganizational units that the overall objectives of GAO are ultimately achieved. The work of GAO units is self-defeating only if it does not further the overall objectives of the organization.

It Can Work

The importance of teamwork in achieving GAO objectives cannot be overemphasized. GAO's size, organizational structure, and wide area of responsibility make teamwork imperative in executing its functions. The concept of teamwork, however, can be effective only if the organizational environment within which it is to operate is conducive to it.

Creating an environment within GAO conducive to teamwork requires the elimination of all obstacles. The protective attitudes found in suborganizational units can at least be dealt with, if not completely eliminated. First, each unit must establish priorities in executing its responsibilities. Emphasis should be on eliminating deficiencies, rather than on which GAO unit should eliminate them. Obviously, the unit most proficient in the area of the audit should perform the work, with assistance as necessary coming from other units having responsibilities in the area. Prior experience in the

work area, familiarity with the agency involved, availability of audit manpower, and proximity to where the work will be performed are just a few of the factors that must be considered in deciding which unit is the most proficient.

GAO's procedures with respect to accomplishment reports and other types of merit recognitions could be used to alleviate any adverse reactions by units performing secondary roles (i.e., providing assistance). For example, accomplishment reports could be modified so that assistance or support provided by secondary units will also be acknowledged. Such recognition would be good for the morale of all GAO units becoming involved in joint audit efforts.

An environment within GAO which is conducive to teamwork, however, requires something more than merely a formalized system for coordinating the efforts of divisions, audit staffs, etc. More important, there must be a day-to-day consciousness on the part of every employee that teamwork is essential in achieving both the objectives of the employee's suborganizational unit and those of the organization as a whole. Cooperation, as well as coordination, should be stressed. Once this consciousness is obtained, the foundation is established for an effective system of teamwork. All that is required of each employee from this point is an awareness of GAO's broad objectives and a willingness to work cooperatively with other employees both within and outside of the employee's suborganizational unit in achieving those objectives.

Who Does It

You'll notice if you read your history, that the work of the world gets done by people who aren't bellyachers.

Harry S. Truman
in *Plain Speaking*
by Merle Miller

JFMIP Leaders Meet

The Joint Financial Management Improvement Program is a cooperative program of all agencies in the Federal Government. Leadership is now provided by the heads of five central agencies—the General Accounting Office, the Department of the Treasury, the Office of Management and Budget, the Civil Service Commission, and the General Services Administration.

On June 27, 1974, the principals of the joint program met with staff officials of the five central agencies to review progress and plans and to sign new terms of reference governing program operations. In presiding over this meeting, the Comptroller General, Elmer B. Staats, *made the following remarks summarizing some recent important developments and matters for continuing future emphasis in improving financial management in the Federal Government.*

This is the last official function over which I will preside during my 2-year term as Chairman of the Joint Financial Management Improvement Program. This will in no sense diminish my active support of the program, however. I am certain that the efforts to strengthen this cooperative program which have been initiated recently will be carried on with vigor and will result in improved financial management in the Government.

The official or technical reason for calling this meeting was to sign the new Terms of Reference for the Joint Financial Management Improvement Program which has come to be known, for brevity, as simply JFMIP. The other reason is to welcome formally Art Sampson, Administrator of General Services, as the new Chairman for a 2-year period beginning next week.

The first Terms of Reference for JFMIP were signed in 1949 by the then Secretary of the Treasury John Snyder, Comptroller General Lindsay Warren, and Budget Director James Webb. This was even prior to the Budget Ac-

At the signing of the Terms of Reference of the Joint Financial Management Improvement Program, June 27, 1974.

Left to right, first row: Secretary of the Treasury, William E. Simon; Chairman of the Civil Service Commission, Robert E. Hampton; Comptroller General of the United States, Elmer B. Staats; Administrator of General Services, Arthur F. Sampson; and Associate Director of the Office of Management and Budget, Robert H. Marik. Left to right, second row: John Lordan, GSA; John Cole, CSC; John Carlock, Treasury; Edward Murphy, CSC; Gerald Murphy, Treasury; Wallace Wasserstein, Treasury; David Mosso, Treasury; Bertram Rosen, JFMIP; Donald Kull, JFMIP; Toney Head, OBM; Donald Scantlebury, GAO; Ronald Zechman, GSA; Fred Layton, GAO; Dwight Ink, GSA; and Thomas Morris, GAO.

counting and Procedures Act of 1950, which established the program in statutory form.

Shortly after I became Comptroller General, new Terms of Reference approved adding the Chairman of the Civil Service Commission to membership in recognition of the important role which the Commission plays in the training and recruitment of financial management specialists. I know I speak for the other members when I

say that our expectation has been fully realized. The Commission has played an active and constructive part over these past 7 years.

Significant developments since that time now make it desirable to again revise and update the Terms of Reference—the document which is before us for signature today. Among the more important developments since 1967 are the following.

1. About a year ago, the President issued an Executive order reassigning certain financial management responsibilities from OMB to GSA. Following this change, Arthur Sampson, Administrator of General Services, accepted the invitation of the other four principals to become a principal in the joint program. GSA has been actively involved in the program during the last year.
2. A July 9, 1973, memorandum from OMB Director Roy Ash assigned responsibilities for a continuing program for measuring and enhancing productivity which grew out of a joint OMB-GAO-CSC productivity project. JFMIP was given responsibility for preparing an annual productivity report to the President and the Congress, analyzing factors causing productivity changes, and seeking opportunities to expand coverage and improve representativeness of productivity measures. GSA, CSC, and the Bureau of Labor Statistics also have important responsibilities in the productivity program.
3. Donald C. Kull was appointed as the first JFMIP Executive Director in December 1973. The staff also includes an Executive Secretary position authorized by the principals in 1968 and filled by Bertram H. Rosen in November 1969.
4. The new Terms of Reference establish an Executive Council with a member appointed by each principal to represent him in dealing with policy matters.

More important than the signing of the new Terms of Reference, as such, is the fact that we have today visibly reaffirmed the importance and the high priority which we attach to improvement in financial improvement practices throughout the Government. I am speaking here of our mutual objectives of:

—Reducing both operating and program costs.
—Providing information and decisionmaking in both the executive and legislative branches of the Federal Government.
—Measuring productivity and relating output more directly to costs.
—Providing information more currently and accurately as to the results of Government programs and the availability of funds to all agencies of the Federal Government and to State and local governments as well.

I believe we are now in the best position we have ever been in to make significant progress in improving financial management throughout the Federal Government—both in the central

agencies and in the many operating agencies. JFMIP has been given a mandate to carry out an aggressive program for promoting widespread application of sound financial management practices.

I hope that even more emphasis can be placed on improving financial management systems in the operating agencies in the years ahead. GAO is moving ahead aggressively in the review and approval of agency accounting systems. The other central agencies are providing technical advice in their own areas. An important added dimension is the new JFMIP emphasis on assisting operating agencies in dealing with specific financial management problems.

JFMIP assistance will normally take the form of organizing interagency project teams, mobilizing expertise from various sources, and advising on systematic approaches to problems. The aim is to help the agency help itself and to share the lessons learned elsewhere. While this approach is not completely new, since a substantial amount of assistance was provided to operating agencies in the early years of JFMIP, the additional emphasis to this aspect of JFMIP is important.

The operating agencies need the kind of support which we are visibly demonstrating here today for their efforts. These agencies' efforts need more recognition for, without their efforts, the Government simply couldn't function—any more than a private enterprise organization could function.

There is a tremendous opportunity for the central agencies to join forces through the JFMIP with the efforts of the operating agencies and to use JFMIP as a clearinghouse for the best financial management practices available anywhere in and out of the Federal Government. For example, the plan for publishing a series of technical bulletins, as outlined in the 1975 program plan, can be an excellent way of capturing good financial management practices and making them available to all agencies.

There is much congressional interest in improving productivity in the Federal Government. You probably know of the hearings and public support of Chairman Proxmire of the Joint Economic Committee and Senator Percy of that Committee. They had some nice things to say about the work that has been done thus far in measuring and improving productivity. OMB support for the continuing productivity program has been important in getting effective participation from most operating agencies. BLS is playing an increasingly important role as the measurement system gets regularized into the same framework as that used for measurement of productivity in the private sector. This is an extremely fruitful area for further work, and I am excited about the opportunities for further progress.

The establishment of the Executive Director's position and the availability of a small, full-time JFMIP staff does not in any way lessen the need for full support and participation by all of the central agencies. In fact, as it becomes possible to start an increasing number of JFMIP projects, there will be added need for all of us to assign capable people to work on cooperative projects. The role of the Executive Director will

be to provide leadership and coordination and to do what prodding is necessary to avoid the time delays so often associated with interagency projects.

As Art Sampson assumes the chairmanship, I know he will have the support of the other four agencies in carrying the program forward. I believe we shall see even more progress over the next 2 years.

Professional Judgment and Integrity Still Needed

The need for standards and principles in financial management is obvious. The Financial Accounting Standards Board, the Cost Accounting Standards Board, and these other groups will no doubt eventually make major contributions to the profession—and to the confidence the public has in the financial data it receives.

But a note of caution: we cannot rely on authoritative rulemaking bodies—no matter how capable, hardworking, or well staffed they may be—to substitute for professional judgment or professional integrity.

Arthur F. Sampson

Administrator of General Services
at National FGAA Symposium,
Dallas, Texas, June 21, 1974

The Watchdog Reports

The following items from past issues of The Watchdog, *the monthly newspaper of the GAO Employees Association, Carl C. Berger, editor, are republished for the benefit of GAO's present staff.*

Abbadessa Appointed Assistant Director

October 1956

John P. Abbadessa has been made an Assistant Director of the Civil Accounting and Auditing Division.

A graduate of McKinley High School of Washington, Mr. Abbadessa received a bachelor of science degree in business administration from American University. After serving more than 3 years in the U.S. Marine Corps as an officer during World War II, he enrolled in the Wharton School of Finance and Commerce, University of Pennsylvania.

There he received a degree of master of business administration in 1947. Mr. Abbadessa is a certified public accountant of the State of North Carolina. He joined the staff of the former Corporation Audits Division in July 1947.

O. B. Hylle to St. Paul Office

December 1956

Orlaf B. Hylle has been appointed Regional Manager of the GAO regional office at St. Paul, Minn., according to the Comptroller General.

Mr. Hylle has a bachelor of business administration degree from the University of Minnesota and is a CPA (Minnesota), and a member of the Minnesota Society of Certified Public Accountants and the American Institute of Accountants. Mr. Hylle was engaged in public accounting for about seven years before coming with the GAO in 1953.

H. C. Barton To Be Regional Manager

December 1956

The Comptroller General announced the appointment of Harold C. Barton to be Regional Manager of the GAO regional office at New Orleans, La.

Mr. Barton has a bachelor of science degree from the University of Alabama, is a Certified Public Accountant (Alabama), and a member of the American Institute of Accountants.

He was engaged in public accounting for about five years. He came with GAO in March 1953.

J. H. Rogers, Jr., To Be Regional Manager

January 1957

The Comptroller General of the

United States announced the appointment of James H. Rogers, Jr., to be Regional Manager of the U.S. GAO regional office at Philadelphia.

Mr. Rogers is a certified public accountant of Pennsylvania and Tennessee, a member of the American Institute of Accountants, and for nine years was with the Philadelphia office of Lybrand, Ross Bros. & Montgomery. He served with the U.S. Navy in World War II attaining the rank of Commander.

He attended the University of Tennessee and has a bachelor of arts degree from Rider College, Trenton, N.J. He has been on the staff of the GAO since 1947.

New Guidelines for OLL

February 1957

Comptroller General Joseph Campbell recently announced new guidelines for the Office of Legislative Liaison to "enable the General Accounting Office to give the best possible service to the Congress by more directly reflecting congressional needs in its legal, investigative, accounting, and auditing programs."

As an independent office in the legislative branch of the Government responsible solely to the Congress, the General Accounting Office continuously receives requests for "advice and the services of staff members on the financial implication of proposed legislation and other matters being studied or investigated" by committees. The realignment of the Office, with staff members assigned responsibility for specific congressional committees and subcommittees, should be much more effective in our important relationship with the Congress.

A small group, under the general direction of Robert F. Keller, Assistant to the Comptroller General, will devote their full time to this work.

The Office of Legislative Liaison is responsible for:

1. Maintaining a continuous liaison with congressional committees and members of Congress.

2. Maintaining, for followup purposes, a record of all correspondence and reports to the Congress, its committees, and individual Members of Congress.

3. Arranging for appearance of GAO representatives before congressional committees.

4. Arranging with the responsible operating division and offices for assistance to congressional committees, including staff assistance, special audits and investigations.

5. Evaluating, for congressional policy implication, reports to the Congress.

6. Performing special assignments as may be made by the Comptroller General.

The liaison representatives engaged in this work are: Owen A. Kane, Charles E. Eckert, Edward T. Johnson, John H. Martiny, and David M. F. Lambert.

L. Powers Among 10 Career Civilians Honored by NCSL

May 1957

Amid thunderous applause from 146 GAO and other Federal officials and

employees who attended the Third Annual Career Service Award Dinner sponsored by the National Civil Service League at the Sheraton Park Hotel on May 6, Lawrence J. Powers, Director, DAAD, was one of the ten career civilians to be honored nationally.

The enthusiastic response by GAOers when the award was presented to Mr. Powers caused Theodore F. Koop, Columbia Broadcasting System News Chief, who served as toastmaster, to comment humorously, "Who's tending store?"

The honor was "in recognition of a distinguished career in the United States Government which has exemplified in an outstanding manner the highest characteristics of public service."

In congratulating Mr. Powers, Joseph Campbell, Comptroller General of the United States, who was among the prominent GAO officials attending the dinner, noted, "The honor you have been given is richly deserved. It reflects credit to you individually, to the career service of the Government, and to the General Accounting Office. Your accomplishments during your 22 years of service will long serve as an inspiration to other officials and employees of the Government."

Mr. Powers has served as the Director, DAAD, since March 1956. He has been an official of the GAO since 1952.

He began his government service as a junior accounting clerk with Treasury in 1935.

L. V. Denney Appointed Claims Director

May 1957

Comptroller General Joseph Campbell has announced the appointment of Lawrence V. Denney as Director, Claims Division, to succeed A. Bank Thomas who retired in February.

Mr. Denney was born in Washington, D.C., on Apr. 5, 1910, and attended District of Columbia elementary and high schools. He received his LL.B. Degree in 1934, and his B.C.S. degree in 1938 from Columbus University in Washington. He is a member of the District Bar. He married Suemary Hite in Washington on Oct. 17, 1939, and they have five children.

Mr. Denney started his career in private industry in 1928. His Federal career commenced in 1935 with his appointment in the Audit Division of GAO. From Audit he transferred to Claims in 1940 where he served as Claims Examiner, Senior Claims Examiner, Principal Claims Examiner and had just been detailed as Special Claims Examiner when he transferred to the Office of the General Counsel in 1942.

His progress in the Office of the General Counsel covered the positions of Assistant Attorney, Associate Attorney, Attorney, Senior Attorney, Attorney Adviser, and in Dec. 1951 he was appointed Assistant General Counsel with duties as legal advisor to the Director of Audits.

C. H. Moore Appointed Detroit Regional Manager

July 1957

The Comptroller General of the United States today announced the appointment of Charles H. Moore to

be Regional Manager of the U.S. GAO regional office at Detroit.

Mr. Moore is a certified public accountant of Georgia, a member of the Georgia State Society of Certified Public Accountants and the American Institute of Accountants, and President of the Atlanta Chapter of the FGAA.

He attended Furman University, George Washington University, University of Tennessee, and the University of Georgia. He came with the GAO in April 1944.

Mahoney Receives GAO's Highest Cash Award

July 1957

The highest cash award ever given to an employee of the U.S. GAO, $1,000, was presented on June 13 to Edward J. Mahoney, Assistant Director, AAPS, by Comptroller General Joseph Campbell. Mr. Campbell presented Mr. Mahoney with a check as a result of his outstanding performance working on a project to apply "modern electronic techniques to the accounting, auditing, and other management functions in Government which involve the processing of large numbers of documents."

In presenting the award Mr. Campbell noted the contributions made by Mr. Mahoney "in increasing the efficiency of Government operations."

Mr. Mahoney headed a staff of GAO employees, who, working together as a team with employees of the Treasury Department and the Bureau of the Budget, have been placing into operation new methods which will greatly simplify and modernize Government check clearance and reconciliation procedures. Working under the Joint Accounting Improvement Program, it was the purpose of the group to combine accounting and auditing techniques with the new media of high speed electronic processing equipment which will eventually result in an estimated annual savings of $1,700,000 to the Government and an additional $500,000 to the Federal Reserve Banks.

In addition to the cash award, Mr. Mahoney was given the U.S. GAO "Distinguished Service Award".

Assistant Directors of DAAD

December 1957

Edward T. Johnson, Joseph Lippman, Stewart D. McElyea, and Thomas E. Sullivan have been designated to be Assistant Directors of DAAD by Joseph Campbell, Comptroller General of the United States, in a recent announcement.

Mr. Johnson has had broad experience in legal, auditing, and accounting systems activities since joining GAO in 1936. He received his law degree from the University of Baltimore in 1934. He studied accounting at Johns Hopkins University and became a CPA in Maryland in 1940. Mr. Johnson served in the United States Army from 1941 to 1946, attaining the rank of lieutenant colonel. He was Chief of Finance of the Veterans Canteen Service from 1946 to 1948. He returned to GAO in 1948 and, except for two years in private business for himself, he has served continuously in GAO since that date.

Mr. Lippman is a graduate of the City College of New York and holds a masters degree in accounting from the University of Michigan. He served in the United States Navy from November 1942 to December 1945. He became a CPA in the District of Columbia in 1951. Mr. Lippman has been with the GAO since 1950. He is a member of the American Society for Public Administration.

Mr. McElyea graduated from the University of Florida in 1942. He was a pilot in the United States Air Force until 1946, serving in the ETO Troop Carrier Command and the Caribbean Transport Command. He was employed by a firm of Florida certified public accountants until 1953 when he joined GAO. Mr. McElyea received his CPA certificate from the State of Florida in 1951. He is a member of the American Institute of Certified Public Accountants and the Florida Institute of Certified Public Accountants. Mr. McElyea is President of the Dayton Chapter of the FGAA. He was employed as a senior accountant in GAO's Dayton regional office, and became Regional Manager in 1956.

Mr. Sullivan, a graduate of the University of Alabama, is a member of the American Institute of Certified Public Accountants and the Pennsylvania Institute of Certified Public Accountants. He served in the United States Air Force from February 1941 to June 1945. Mr. Sullivan joined the GAO in 1951 as a senior auditor. He attained the status of supervisory auditor and was assigned to GAO's European Branch in 1954 where he served until 1956. He was Assistant Director of the European Branch during the last six months of his overseas assignment.

News & Notes

GAO Organization Changes

As of July 1, 1974, the following changes were made in GAO's organization structure:

- *A position of Assistant Comptroller General for Management Services* was established. *Thomas D. Morris* was appointed to this position. He will have responsibility on an office-wide basis for the efforts of the Office of Personnel Management and the Office of Administrative Planning and Services. He will also assume responsibility for budgetary formulation and execution.
- *A position of Assistant Comptroller General for Special Assignments* was established to assist in the review of selected programs of the General Accounting Office and to advise the Comptroller General with respect to current and long-term plans. *A. T. Samuelson* was appointed to this position.
- *The Assistant Comptroller General positions formerly occupied by Mr. Morris and Mr. Samuelson will not be filled.* The division directors concerned will report directly to the Deputy Comptroller General and the Comptroller General in the same manner that the International Division, the Transportation and Claims Division, and the Field Operations Division presently report. The designations of General Management Reviews Group and Domestic Programs Group were discontinued.
- *Assistant Comptroller General Phillip S. Hughes* will continue his responsibilities for the Office of Energy and Special Projects and will advise the Comptroller General in coordinating, monitoring, and program development on a GAO-wide basis for work involving energy and commodity (materials) shortages. He will also be responsible for developing and coordinating GAO's efforts in support of carrying out the responsibilities assigned to GAO under the Congressional Budget and Impoundment Control Act of 1974. In this connection, he will provide liaison with the Congressional Budget Office, the Department of the Treasury, and the Office of Management and Budget. The Office of Federal Elections will continue to report to Mr. Hughes.
- *The Division of Financial and General Management Studies* will report directly to the Deputy Comptroller General and the

Comptroller General.

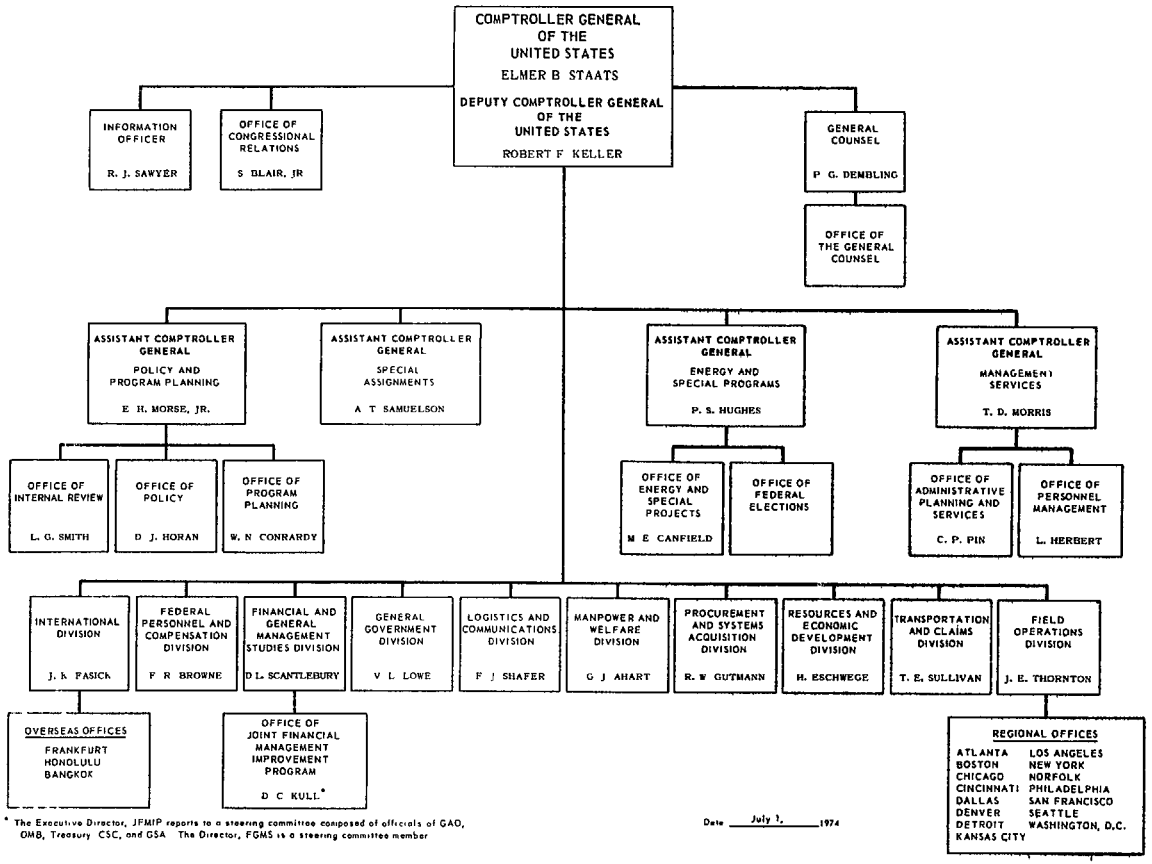
In announcing these changes, the Comptroller General stated:

> I believe that these changes will further strengthen the capability of the General Accounting Office to discharge its increasing responsibilities and workload. In the period ahead, it is particularly important that we strengthen our internal management services so as to provide the maximum strength in our programs for staff development, for improved management information systems, and the management of our staff resources so as to be able to accommodate on a continuing basis the work which we are doing in the areas of the highest priority concern.
>
> * * * * *
>
> As Assistant Comptroller General for Special Assignments, Mr. Samuelson will undertake a variety of assignments. I have asked him to give priority attention to ways in which we can strengthen our capability to plan our program in several high priority areas. In this connection, he will be working closely with Assistant Comptroller General *Morse* and the Office of Program Planning.

The following additional changes were announced by the Comptroller General on August 16, to be effective on September 3, 1974:

- *Clerio P. Pin*, formerly director of the Office of Administrative Planning and Services, was designated Deputy Assistant Comptroller General for Management Services. In this capacity, he will assist in the direction of management service activities.
- A new Office of Staff Development was established with general responsibility for improving the skills and performance of GAO employees and increasing opportunities for individual and group achievement. *Thomas D. Morris*, Assistant Comptroller General for Management Services, was designated to act as director of this office until a permanent director is chosen. The Office of Personnel Management is continuing under the direction of *Leo Herbert* with responsibility for personnel and staff functions not assigned to the Office of Staff Development.
- Other new offices established are:
  - Office of Controller, responsible for budgeting, accounting, and management information systems. *Jack L. Green* was designated controller.
  - Office of Administrative Services, responsible for space, equipment, supplies, the Operations Manual System, and contracting. *Larry A. Herrmann* was designated director.
  - Office of Publishing and Graphics Services, responsible for editing, illustrating, copy preparation, and printing services. *William J. McCormick, Jr.*, was designated director.
  - Office of the Librarian, responsible for GAO's law and technical library. *Dorothy M. Albert* is continuing as librarian.
- The Planning and Analysis Staff (formerly Organization and Management Planning Staff) under *B. Douglas Hogan* is responsible

UNITED STATES GENERAL ACCOUNTING OFFICE



* The Executive Director, JFMIP reports to a steering committee composed of officials of GAO, OMB, Treasury CSC, and GSA The Director, FGMS is a steering committee member

Date July 1, 1974

for special studies of organization, methods, and procedures.

The Problem in Evaluating Revenue Sharing

In his testimony on June 12, 1974, before the Subcommittee on Intergovernmental Relations of the Senate Committee on Government Operations, the Comptroller General, *Elmer B. Staats*, commented as follows on this problem:

> A basic problem encountered in attempting to assess revenue sharing is the question of how to identify what has actually happened as a result of the program.
>
> Although I have briefly outlined how the State governments and the 250 selected local governments were using their revenue sharing funds, it must be recognized that such data merely shows where the funds are directly expended and may not show what the government has been able to accomplish because of the program. The actual effect of the program on a government and its citizens could be much different than the effects indicated by the government's financial records and related reports.
>
> Because of the wide discretion that recipients have in using the funds, revenue sharing represents merely an addition to the total resources available to a government for expenditure. Revenue sharing, aid from other governments, and a government's own resources can often be used to provide the same services. This creates an environment where funds can be easily displaced or substituted. In other words, a government that uses its revenue sharing to pay police salaries can use its own funds, which would have been used for these salaries, for some other purpose.
>
> Therefore, when a recipient uses revenue sharing for any purpose, there are a variety of consequences which are not necessarily reflected by the direct uses of the funds: (1) its own funds may be used to finance other programs, (2) it may be relieved of the need to raise taxes or incur debt, (3) it may be able to reduce taxes, (4) or there may be a combination of these or other consequences. Such consequences are inherent in the budgetary decision-making process.

Getting Information in a Hurry

Charles Patton and *Peter Leyton* of the Washington regional office report on this subject in the June 1974 newsletter of that office, *The Ledger*, as follows:

> During the course of preliminary work on educational testing, we recently utilized an information retrieval system which may be of future use to others in the education area. It is called the Educational Resources Information Center (ERIC) and is funded by the National Institute of Education located at 1832 M Street, NW, Washington, D.C.
>
> A literature search can be made by providing the Educational Reference Center with various key words and parameters for the subject area in question, such as testing, testing bias, testing problems, and cross-referencing these words with, for example, the sponsoring agency or a particular contractor's name. The computer actually located in California will quickly list all relevant literature available complete with pertinent factual data as well as a short abstract of each research project cited.
>
> During a 45-minute period that we spent with ERIC, our search grew from zero sources to 16,000 potential pieces of literature sponsored by either the Office of Education or the National Institute of Education since 1969. During the final 15 minutes, refinements were made which reduced our total universe to 365 major source documents. Abstracts for these documents were then quickly printed out and were available the next day.

Sources for the entries are cited as well. These usually are either one of two monthly publications of ERIC—*Current Index to Journals in Education* or *Research in Education,* a research document available from the ERIC Document Reproduction Service (EDRS) in either microfiche or paper copy. EDRS is located at P.O. Drawer 0, Bethesda, Maryland 20014.

Other sources are cited for those not available at EDRS. Many items, as well as the monthly publications, are also available at public and college libraries. For assistance and further information, call Charles Missar at the Educational Reference Center, 254-8934.

Information Needs of the Congress

Testifying before the Joint Committee on Congressional Operations on May 16, 1974, Lester S. Jayson, Director of the Congressional Research Service, provided the following picture of the complex problem of what the Congress needs in the way of information.

One of the difficulties in considering the information and research needs of Congress is the tendency to think of the legislature solely as a monolithic institution possessing unified, coherent, and consistent desires. Our experience indicates that it is quite misleading to pose the question only in terms of what 'Congress' wants or needs because Congress is, in fact, an enormously complex pluralistic entity.

Yes, Congress has its informational needs as an institution. But Congress also consists of a great many Members, all of whom may have different needs because of their differing backgrounds, interests, constituencies, and circumstances. It also consists of a large number of committees and subcommittees whose needs may parallel or differ greatly from those of individual Members.

Furthermore, as each of you knows better than I, every Member is himself a plural entity whose information needs often vary with each of his multiple roles. A Member may want one kind of informational support in a wide variety of formats for his role as a member of a committee, a different kind of support in other formats for dealing with legislative proposals before committees of which he is not a member, a third kind of informational support with respect to other measures and proposals upon which he must vote on the floor of his legislative body, and still a fourth kind to carry out his informational responsibilities to his constituents.

Finally, we face a situation in which Members, committees, and staffs of Congress often disagree with each other about the kinds of information support they want personally or think Congress should have generally. Some Members, for example, say Congress must have a think-tank type of support; others believe such a resource is totally unnecessary and a waste of money. And let me point out that despite the directives of the 1970 Act and its legislative history, there are a few committees that either do not need or do not want "massive aid in policy analysis," although obviously there are a great many more that do.

What, then, does Congress 'really' want?

Our experience indicates that Congress as an institution and as a pluralistic entity wants a reasonable parity with the executive branch in access to information and expertise. It wants unbiased information, free from the taint of personal, group, or institutional self-interest. It wants meaningful and reliable information and research that will facilitate legislative decision-making. It wants analytical, interpretive, and consultative services.

It wants research that is relevant, authentic, compact, complete, objective, nonpartisan, and timely. It wants research that reflects communication *with the past* by reference to the relevant historical record, *with the present* in such forms as reference to contemporary views of authorities, including views not yet committed to writing, and *with the future* by way, for example,

of anticipating and understanding social and technological change and the possibility that budget commitments may preempt future options.

It also wants policy analysis that will identify, define, and sharpen legislative issues, offer and explore alternative policy and legislative approaches and solutions, and recognize implications and consequences. It wants authoritative opinions and expert technical support. It wants resources that will help it anticipate public policy problems so they can be dealt with in a timely fashion.

It also wants literally hundreds of thousands of facts on an encyclopaedic and ever growing range of subject matter—legislative and non-legislative. It wants those facts arranged in dozens of different ways and embodied in a wide variety of formats—in summaries, in exhaustively detailed reports and analyses, in speeches, in publications, and, most recently, displayed on office television screens. It wants them tailored for dozens of different purposes and uses, written in technical or laymen's language as necessary. Sometimes it wants cursory treatments; sometimes it wants penetrating analyses. And it wants all this, and more, on time: this month, this week, this day, within the hour, at this minute over the telephone.

Tom Morris to Receive National Civil Service League Award

Assistant Comptroller General *Thomas D. Morris* has been selected as one of the recipients of the 1974 National Civil Service League Career Service Award for Sustained Excellence. The award will be presented October 9, 1974.

In announcing the award, Comptroller General Staats stated:

> I'm delighted that *Tom Morris* has had this recognition. The National Civil Service League Award is one of the finest offered for career people in the Federal service. In receiving this Award, *Mr. Morris* joins previous League winners *Ellsworth Morse*, *Sam Hughes*, and *Paul Dembling*. We are all proud to have these officials—and the GAO—receive this recognition.

Campaign Treasurers' Handbook

The American Institute of CPAs published a revision of its *Campaign Treasurers' Handbook* in June 1974. *Dean Crowther*, deputy director of the Manpower and Welfare Division and a member of the AICPA Legislative Action Committee, prepared the revision. He was cited by an official of the Institute as having "made a real contribution to the profession through his work on the *Handbook*."

In announcing the availability of the *Handbook* ($2.50 a copy at AICPA headquarters in New York City), the AICPA stated:

> There's no sadder political figure than the defeated candidate who ran up a lot of bills he can't pay. Even victorious candidates find it hard to raise political funds after the votes are counted; but for those who lose . . .?
>
> Fund-raising, like Christmas shopping, should be done early. That's one bit of advice offered political candidates and their staffs by the American Institute of Certified Public Accountants, whose *Campaign Treasurers' Handbook* has just been updated and reissued in time for the 1974 elections.
>
> The handbook summarizes state regulations covering the collection, expenditure and reporting of campaign funds; offers sample forms for use by campaign treasurers; and discusses tax aspects of election finances.
>
> Among the suggestions the CPAs offer candidates are:
>
> - Never be afraid to return a questionable contribution.

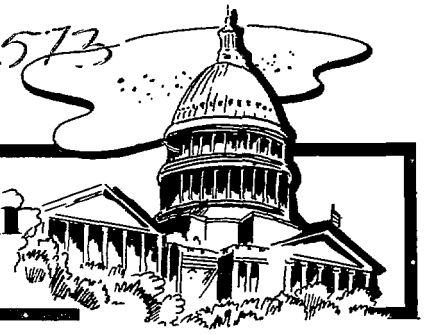
- Never make a commitment for an expenditure without having cash in hand.
- Never regard someone's pledge to contribute as cash.
- Whether or not your state prohibits deficit spending, don't do it.
- Where possible, spend backward, reserving the early contributions for expenses at the end of the campaign. The closing days of an election drive are the most important and should be provided for first.
- Before you do anything, study applicable 'Corrupt Practices' laws with your lawyer.

Untainted

With all that is in the news, Americans have a right to be down on their Government, but in the General Accounting Office, and the closely related Cost Accounting Standards Board, we have two untainted organizations that stand far above all the agencies as true, loyal, and dedicated professionals. It is the GAO that ferrets out the over-runs, boondoggles, and malfeasance in this huge Government of ours. . . . Because of GAO's sterling reputation, the Congress is heaping additional responsibilities on the agency, most recently with regard to the budget reform measure that will probably necessitate a supplemental estimate.

Senator Ernest F. Hollings
Congressional Record
June 20, 1974

Hearings & Legislation



By JUDITH HATTER
Assistant Chief, Legislative Digest Section

Legislative Research

A further legislative research aid has been added to the marginal notes on slip copies of public laws.

While in the past United States Code citations to amended laws have been marginally annotated, beginning with Public Law 93-259, April 8, 1974 (the Fair Labor Standards Amendments of 1974), the citation to the place in the United States Code where the new sections of law will be codified has been included.

Congressional Budget and Impoundment Control Act of 1974

A noteworthy legislative enactment was signed by the President on July 12, 1974. Public Law 93-344 establishes a new congressional budget process, Committees on the Budget in each House, a Congressional Budget Office, and a procedure providing congressional control over the impoundment of funds by the executive branch.

The functions and duties of the Comptroller General with respect to the review and evaluation of the results of Government programs and activities for the Congress are expanded to include, among other things, assistance to committees in developing statements of legislative objectives and methods for assessing program performance.

The Comptroller General is assigned certain responsibilities with respect to the establishment of standardized budget information systems; the development of standard terminology, definitions, classifications, and codes; and the availability of budget information to the Congress and to State and local governments.

Title X of the law concerning impoundment control requires the Comptroller General to review messages of deferral or rescission of budget authority to ascertain for the House of Representatives and the Senate certain stipulated information. The Comptroller General also is required to notify the Congress of instances when reserves or deferrals are not reported as required. Authority to bring suit to make budget authority available for obligation is vested in the Comptroller General.

Congressional Information and Analysis Capabilities

On June 19, 1974, the Comptroller General testified at hearings pertaining to efforts to strengthen congressional information and analysis capabilities. These hearings, conducted by the Joint Committee on Congressional Operations, concerned GAO efforts to fulfill responsibilities under the Legislative Reorganization Act of 1970 and plans to carry out functions vested in it by the Congressional Budget and Impoundment Control Act of 1974.

Comments were concentrated on review and evaluation of the results of Government programs and activities; cooperative work with the Office of Management and Budget and the Treasury Department to improve congressional access to fiscal, budgetary, and program-related data; and the usefulness of that data to the Congress.

Appended to the statement were summaries of selected GAO reports during the past 18 months in which the primary objective was to evaluate the effectiveness of Federal programs. (Other participants: Messrs. *Hughes, Morse, Scantlebury, Marvin, Hunter,* and *Sperry*)

General Accounting Office Legislation

The Comptroller General appeared on June 5 before the Subcommittee on Legislation and Military Operations of the House Government Operations Committee to discuss H.R. 12113, to revise and restate certain functions and duties of the Comptroller General; H.R. 14718, to discontinue or modify certain reporting requirements of law; and H.R. 12181, to direct the Comptroller General to conduct a study of the burden of reporting requirements of Federal regulatory programs on independent business establishments.

The proposed General Accounting Office Act of 1973, H.R. 12113, as introduced, contains seven titles:

I Eliminate the existing $100 limitation on the amount of disbursement vouchers subject to audit by statistical sampling and authorize the Comptroller General to impose the limitation.

II Transfer primary responsibility for audit of transportation bills to the executive branch.

III Authorize GAO to audit nonappropriated fund activities.

IV Authorize employment of experts and consultants.

V Transfer control of the GAO building from GSA to the Comptroller General.

VI Authorize audits of Government corporations once every 3 years instead of annually.

VII Eliminate the annual audit requirement in various laws relating to other Government activities.

An eighth title was added by the Subcommittee providing for a decrease from 10 to 6 years in the time for filing claims with GAO. (Other participants in the hearing: Messrs. *Keller, Morse, Hughes, Dembling, Pierson, Williamson, Sullivan, Conrardy, Pin, Landicho, Rosen,* and *Sperry*)

Hearings on the companion bill in the Senate (S. 3013) were held on August 7 by the Subcommittee on Budgeting, Management and Expenditures of the Government Operations Committee. The Comptroller General and the Deputy Comptroller General testified. (Other participants: Messrs. *Hughes, Morse, Sullivan, Socolar, Pierson, Williamson, Conrardy, Herrmann,* and *Sperry*)

Revenue Sharing

On June 12, the Comptroller General appeared before the Subcommittee on Intergovernmental Relations of the Senate Government Operations Committee to summarize the results of completed reviews of revenue sharing and to describe future revenue sharing studies to be undertaken. (Other participants: Messrs. *Hair, Goldbeck, Thurman,* and *Sperry*)

Uranium Enrichment

The Comptroller General discussed the future structure of the uranium enrichment industry before the Joint Committee on Atomic Energy on June 26.

It was suggested that an independent Government corporation with self-financing authority would allow the operation of the enrichment plants to be conducted as a business-type enterprise with more independence and flexibility in operating a uranium enrichment program. (Other participants: Messrs. *Wessinger, Degnan, Higgins,* and *Sperry*)

Federal Science and Technology Policy

The Comptroller General testified on Federal policy, plans, and organization for science and technology on July 9 before the House Science and Astronautics Committee. He addressed himself to the Executive Office role and organization, based on his experience before becoming Comptroller General in 1966, and how best to structure the science policy apparatus to accommodate the President's advisory role, oversight, and coordination of Government-wide research and development and the solving of long-term problems with science components.[1] (Other participants: Messrs. *Hughes, Rubin, Fundingsland,* and *Sperry*)

Medicare and Medicaid Home Health Care Benefits

On July 9, *Gregory J. Ahart,* director, Manpower and Welfare Division, appeared before the Subcommittee on Health of the Elderly of the Senate Special Committee on Aging to discuss the results of GAO's review of home health care benefits under Medicare and Medicaid.

It was recommended that the Secretary of Health, Education, and Welfare impress upon the States the potential of home health care as an alternative to institutional care, clarify for the States the specific home health services covered under Medicaid, encourage the States to establish reasonable pay-

[1] The Comptroller General's testimony appears in "Federal Organization for Science and Technology," p. 1.

ment rates for services provided by home health agencies, and assist home health agencies in their efforts to increase the health field's awareness and support of home health as an alternative to institutional care. (Other participants: Messrs. *Densmore, Lauve, Johanson, Zipp,* and *Bowlin*)

Federal Grant and Procurement Relationships

Gregory J. Ahart, director, Manpower and Welfare Division, testified on July 10 before the Ad Hoc Subcommittee on Federal Procurement and the Subcommittee on Intergovernmental Relations of the Senate Government Operations Committee on S. 3514, to distinguish Federal grant and cooperative agreement relationships from Federal procurement relationships.

The bill would have the effect of adopting the substance of two recommendations of the Government Procurement Commission supported by the Comptroller General as a statutory member of the Commission. (Other participants: Messrs. *Crowther, Hall, Pierson,* and *Sperry*)

Defense Information Classification

On July 11, *Paul G. Dembling,* general counsel, appeared before the Foreign Operations and Government Information Subcommittee of the House Government Operations Committee to discuss the provisions of H.R. 12004, which would amend the Freedom of Information Act to provide a statutory system for classifying, downgrading, and declassifying official information in the interest of national defense.

In addition to testimony on H.R. 12004, the operation of Executive Order 11652 in GAO was discussed. This Executive order grants authority to originally classify information to certain stipulated departments in the executive branch. (Other participants: Messrs. *Chicca, Hylander* and *Sperry*)

Executive Pay Adjustment

The Comptroller General appeared on June 20 before the Senate Post Office and Civil Service Committee to discuss several bills dealing with rates of pay for levels established by the Executive schedule and comparable positions in the legislative and judicial branches.

The Comptroller General favored the retention of the present quadrennial commission concept but suggested including a procedure for annual adjustments between the quadrennial review based on a reasonable index, such as movements in the cost of living or the average rate of GS salary increase for each year, whichever is lower. (Other participants: Messrs. *Browne, Emery,* and *Blair*)

Wildlife Conservation

On June 26, *Henry Eschwege,* director, Resources and Economic Development Division, discussed the GAO report on improved Federal efforts needed to equally consider wildlife conservation with other features of water resources development before the Subcommittee on Fisheries and

Wildlife Conservation and the Environment of the House Committee on Merchant Marine and Fisheries. (Other participants: Messrs. *Charam, Pichney, Zimmerman, Choruby,* and *Griffith*)

Nursing Facility Fire Safety

Gregory J. Ahart, director, Manpower and Welfare Division, appeared before the Subcommittee on Special Studies of the House Government Operations Committee on June 11 to discuss the results of a review of fire safety in federally funded skilled nursing facilities requested by the Chairman of the Subcommittee. Existing problems in the application of the Life Safety Code promulgated by the National Fire Protection Association were described. (Other participants: Messrs. *Densmore, Lauve, Johanson,* and *Sperry*)

Mileage and Per Diem Allowances

On June 6, 1974, *James M. Campbell,* associate general counsel, appeared before the Budgeting, Management and Expenditures Subcommittee of the Senate Government Operations Committee to discuss the provisions of S. 3341, relating to per diem and mileage expenses of employees and other individuals traveling on official business.

GAO opposes the provision of the bill which vests in the Comptroller General the function of conducting a continuous study of vehicle operating costs and submitting to the President periodic adjustments in mileage rates based on these studies, since this is primarily a function of the executive branch. (Other participants: Messrs. *Monsma, Miller,* and *Sperry*)

Health Profession Scholarships

Morton E. Henig, associate director, Manpower and Welfare Division, appeared on May 29 before the Subcommittee on Public Health and Environment of the House Interstate and Foreign Commerce Committee to comment on the proposed Health Manpower Act of 1974 and the National Health Services Manpower Act of 1974 in the light of GAO's work in the area of one of the Federal programs designed to alleviate national health manpower shortages—the Health Professions Student Assistance Program, which involves long-term, low-interest loans and scholarships to health professions students. (Other participants: Messrs. *Myers, Dion, Etze, Williamson,* and *Griffith*)

Procurement Procedures

On May 21, *James H. Hammond,* deputy director, Procurement and Systems Acquisition Division, appeared before the Subcommittee on Legislation and Military Operations of the House Government Operations Committee to discuss H.R. 14494, which proposes raising to $10,000 the ceiling for Government procurements subject to simplified purchasing procedures.

GAO favors this legislation, which was recommended by the Commission on Government Procurement in its report of December 31, 1972. (Other

participants: Messrs. *Weinfeld, Padgett,* and *Sperry*)

Commodity Exchange Authority

Henry Eschwege, director, Resources and Economic Development Division, appeared on May 20 before the Senate Agriculture and Forestry Committee to discuss the results of the GAO review of the Agriculture Department's Commodity Exchange Authority and commodity futures trading at hearings on bills to regulate futures trading in agricultural and other commodities (S. 2485, S. 2578, S. 2837, and H.R. 13113).

GAO favors creation of an independent agency, separate from the Department, because it would remove appearance of a conflict of duties and responsibilities. (Other participants: Messrs. *Hirschhorn, Elsken,* and *Sperry*)

Service Contract Act of 1965

Paul G. Dembling, general counsel, appeared at oversight hearings on the general operation of the Service Contract Act of 1965 before the Special Subcommittee on Labor of the House Education and Labor Committee on May 7, to describe GAO decisions pertaining to the implementation and application of the act. (Other participants: Messrs. *Shnitzer, Gallagher, Peck,* and *Bowlin*)

National Stockpile Disposals

On May 16, *Werner Grosshans,* associate director, Logistics and Communications Division, appeared before Subcommittee No. 3 of the House Armed Service Committee to discuss the release of metallurgical grade chromite from the stockpile and the change in assumptions which form the basis for stockpile objectives. (Other participants: Messrs. *Smarrelli, Virbick, Wilson,* and *Fitzgerald*)

Problem Solving

Drowning problems in an ocean of information is not the same as solving them.

Professor Ray E. Brown
Duke University
in *Judgment in Administration,* 1966

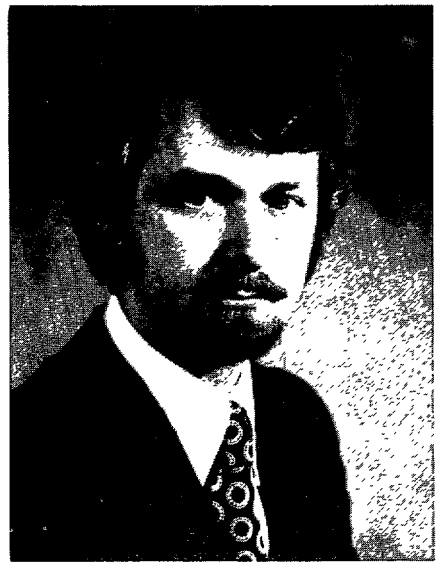
James M. Campbell

James M. Campbell, associate general counsel, who directed the civilian and military personnel work of the General Counsel's Office, retired on June 28, 1974, after more than 33 years of Government service following his appointment in the General Accounting Office in 1941. With the exception of approximately 2 years of active naval service during World War II and 2 years of civilian service as an attorney in the Department of the Navy, Mr. Campbell's entire career has been with the General Accounting Office.

After extensive service in various legal capacities in the General Counsel's Office, Mr. Campbell was appointed as director of the Claims Division on March 2, 1970, and when that Division was consolidated with the Transportation Division as part of the 1972 reorganization of the General Accounting Office, Mr. Campbell was designated deputy director of the Transportation and Claims Division. Effective July 22, 1973, Mr. Campbell was appointed to the position of associate general counsel, which he occupied at the time of his retirement.

Mr. Campbell is a graduate of The George Washington University, receiving a B.A. degree in 1937 and an LL.B. degree in 1939. He is a member of the District of Columbia bar and is admitted to practice before the District Court of the United States for the District of Columbia, the United States Court of Appeals for the District of Columbia, and the Supreme Court of the United States.

Monte E. Canfield, Jr.



Monte E. Canfield, Jr. joined the General Accounting Office on July 7, 1974, as director, Office of Energy and Special Projects.

From 1972 to 1974, Mr. Canfield was deputy director of the energy policy project, established by the Ford Foundation in 1972 to make a comprehensive analysis of national energy policy problems. From 1969-72, he was Chief of the Division of Minerals of the Bureau of Land Management in the Department of the Interior. For 6 years prior to 1969, he was a budget examiner in the Bureau of the Budget, where he advised the Budget Director on natural resources programs. Mr. Canfield represented the Bureau of the Budget on two committees of the Federal Council for Science and Technology—water resources research and solid earth sciences. Before joining the Federal Government, he served in the New York State Department of Civil Service in Albany.

Mr. Canfield holds a B.A. degree in political science from Wichita University (1960) and a master's degree in political science from the University of Colorado (1963). He completed a year of additional postgraduate work at Cornell University.

John J. Higgins

John J. Higgins was designated an associate general counsel (general government matters) in the Office of the General Counsel, effective July 7, 1974.

Mr. Higgins attended The George Washington University in 1947 and received a Special Certificate in Law from Columbus University (now merged with Catholic University) in 1951. He was admitted to the bar of the District of Columbia in 1952 and is a member of the Federal Bar Association.

Mr. Higgins entered the Federal service on August 26, 1940, with the Federal Bureau of Investigation and served mostly in the Identification Division. He began his General Accounting Office service in September 1952 as an attorney in the Office of the General Counsel; he was designated a deputy assistant general counsel on April 5, 1970, and an assistant general counsel on November 11, 1972. He received the GAO Meritorious Service Award in 1963, 1966, 1968, 1970, and 1974.

Donald J. Horan

Donald J. Horan was designated as the acting director, Office of Policy, effective July 1, 1974.

Mr. Horan received a bachelor of science degree in accounting from Kings College in 1955. He joined the staff of GAO's New York regional office in 1955 and held positions of increasing responsibility in that office before transferring to the audit policy staff of the Office of Policy and Special Studies in 1965. In 1968 he was designated as assistant director for auditing policy, a position which he occupied until 1972. He transferred to the Procurement and Systems Acquisition Division in 1972 as an assistant director in its general procurement management division.

Mr. Horan received a Meritorious Service Award in 1968. He is a member of the Federal Government Accountants Association.

Rollee H. Lowenstein

Rollee H. Lowenstein has been designated assistant general counsel (civilian personnel), effective August 18, 1974.

In her new position, Mrs. Lowenstein will be responsible for matters concerning pay, leave, travel, transportation, and other rights and benefits of Federal civilian personnel.

Mrs. Lowenstein joined the Federal service in 1963 as a legal consultant to the D.C. Department of Public Health. She later transferred to the National Institute of Mental Health as a public health analyst. In 1966 she was named Chief of that Institute's Legislative Services Branch. In 1973 she was appointed a senior attorney in the General Accounting Office.

Mrs. Lowenstein received a B.A. degree from Antioch College in 1945 and her J.D. degree from the Columbia Law School in 1948. She is a member of the bars of the District of Columbia and New York. She is also a member of the Federal and American Bar Associations, the National Health Lawyers Association, the American Public Health Association, and the Montgomery County Mental Health Association. She has numerous published articles to her credit and is a recognized authority on issues involving mental health activities and the law.

Edwin J. Monsma

Edwin J. Monsma has been designated assistant general counsel (military personnel), effective August 18, 1974.

In his new position Mr. Monsma will be responsible for matters relating to pay and allowances, retirement pay, travel, transportation, and other rights and benefits of members of the uniformed services.

Mr. Monsma joined the General Accounting Office as an attorney in 1958. From 1970 to 1972 he was a management analyst with the Office of Management and Budget and was primarily concerned with regulations governing Federal personnel administration. In 1973 he was named deputy assistant general counsel (civilian personnel).

Mr. Monsma received his B.A. degree in 1953 from Calvin College, Michigan, and a J.D. degree with distinction from The George Washington University Law School in 1956. He is a member of the D.C. Bar Association and the Federal Bar Association.

Max A. Neuwirth

Max A. Neuwirth, associate director, General Government Division, retired from the General Accounting Office on May 10, 1974, after 39 years of Federal service. Mr. Neuwirth began service as assistant auditor in the former Audit Division in July 1935.

Before joining the GAO in 1935, Mr. Neuwirth was a practicing public accountant in New York City. He attended the City College of New York, Strayer College of Accounting, and Washington College of Law and received degrees of bachelor and master of commercial science and a bachelor of law degree. He served in the U.S. Navy from January 1942 to December 1945.

Mr. Neuwirth has held diverse assignments of increasing responsibility in the former Audit, Corporation Audits, Defense, and Civil Divisions and in the General Government Division. His assignments prior to his retirement included the audit responsibility for the Department of Justice, D.C. Government, and Legislative accounts.

Mr. Neuwirth received the Meritorious Service Award in 1967 and a superior performance award in 1968. He is a member of the National Association of Accountants and is presently serving as the Director of Manuscripts of its Washington chapter.

Clerio P. Pin

Clerio P. Pin, formerly director of the Office of Administrative Planning and Services, was named Deputy Assistant Comptroller General for Management Services, effective September 3, 1974. In this position he will assist *Thomas D. Morris,* Assistant Comptroller General, in the direction of GAO management service activities, reorganized as described in the News and Notes section (p. 70).

Mr. Pin served with the Navy during World War II. He received a bachelor of science degree in accounting from the University of Scranton in 1951.

He first joined the staff of the General Accounting Office in 1951. He completed the Advanced Management Program at the Harvard Business School in 1965. In 1968, he left GAO to accept a position with the Atomic Energy Commission. There he served as special assistant to the director of the Division of Reactor Development and Technology and as assistant to the controller.

In April 1971, Mr. Pin returned to the General Accounting Office as director, Organization and Management Planning Staff, and in December of that year he was designated director of the Office of Administrative Planning and Services.

Harold H. Rubin

Harold H. Rubin retired as deputy director (science and technology) of the Procurement and Systems Acquisition Division, June 28, 1974, after 38 years of service with GAO. He agreed, however, to a temporary appointment as a reemployed annuitant through December 1974.

Mr. Rubin received a bachelor of arts degree in government from The George Washington University in 1941 and attended the Advanced Management Program of the Harvard Business School in 1963. He is a certified public accountant (Illinois) and a member of the American Institute of Certified Public Accountants and the Federal Government Accountants Association.

Mr. Rubin has had broad experience in the accounting, auditing, and evaluation activities of the General Accounting Office. He served as manager of the St. Paul and Dayton regional offices during 1951 to 1955 before being appointed as assistant director of the former Defense Accounting and Auditing Division. In 1961, he was designated associate director of that division and in 1966 he became responsible for the direction of examinations of research and development activities of the Department of Defense and the military services and their contractors. Following the reorganization of GAO in 1972, Mr. Rubin was appointed deputy director in charge of the technology advancement (later designated science and technology) subdivision, Procurement and Systems Acquisition Division.

Daniel F. Stanton

Daniel F. Stanton was designated an associate director in the General Government Division, effective August 18, 1974. His responsibilities include directing the audit and investigative work at the Department of Justice, D.C. Government, and the judicial and legislative branches.

Mr. Stanton served in the U.S. Army from 1954 to 1956. He graduated from the University of South Carolina in 1959, receiving a bachelor of science degree with a major in accounting. He is a certified public accountant in Virginia and a member of the American Institute of Certified Public Accountants and the National Association of Accountants.

In 1971 Mr. Stanton attended the Harvard Program for Management Development. He received the GAO Meritorious Service Award in 1967 and the Career Development Award in 1971.

L. Fred Thompson

Fred Thompson, director of the Office of Federal Elections, retired June 28, 1974.

Beginning as a file clerk in 1941, Mr. Thompson has served under three Comptrollers General in Washington, field, and overseas offices as claims examiner, investigator, attorney advisor, and senior legislative attorney in the Office of Legislative Liaison. He also has two periods of service in the Army.

After the Federal Election Campaign Act was approved in February 1972, Mr. Thompson was assigned the task of writing GAO's regulations for implementing the law for Presidential candidates. He was designated deputy director of GAO's newly established Office of Federal Elections in March 1972 and served in that capacity until he was appointed director in December 1973 to succeed *Phillip S. Hughes* who was named Assistant Comptroller General.

Other Staff Changes

New Assistant Directors

Office of Energy and Special Projects

James Duffus
John W. Sprague

Office of Internal Review

L. Neil Rutherford

Federal Personnel and Compensation Division

Donald G. Goodyear
Charles W. Thompson
Francis W. White, Jr.

General Government Division

Jacob Wild

Procurement and Systems Acquisition Division

David A. Littleton

Resources and Economic Development Division

Robert L. Allen, Jr.
Lloyd L. Gregory
Clare K. Rohrer

New Senior Attorneys

Stanley G. Feinstein
Howard S. Levy
Albert J. Riedingler
Ellwood C. Wells
Henry R. Wray

New Assistant Regional Managers

Chicago

Daniel C. White

Other Designations

Office of Personnel Management

Clarence L. Forbes—director, Upward Mobility Program

Office of Joint Financial Management Improvement Program

Herbert S. Millstein—assistant to executive director

Retirements

Office of Administrative Planning and Services

Sanford H. Cornett—assistant director

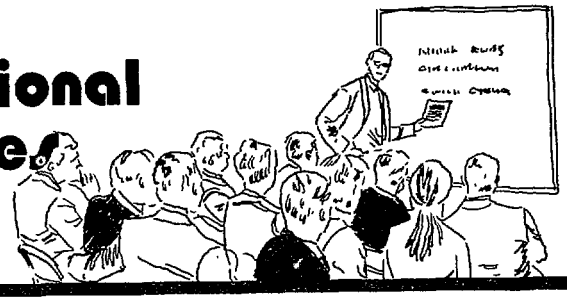
Logistics and Communications Division

Mathew Gradet—assistant director

Office of the General Counsel

Darrell L. Jones—senior attorney

Professional Activities



Office of the Comptroller General

The Comptroller General, *Elmer B. Staats*, addressed the following groups:

National Association of College and University Business Officers at the annual meeting of the Committee on Governmental Relations, Washington, D.C., on "The Office of the Comptroller General and its Relationship to the Higher Education Community," June 6.

University of Denver College of Business Administration, Interterm Seminar, Executive MBA Program, Colorado Springs, Colo., on "Accountability for the Management of Public Programs," June 8.

Panel on International Information, Education and Cultural Relations, The Center for Strategic and International Studies, Georgetown University, Washington, D.C., on "International Information, Education and Cultural Relation Programs of U.S. Government and Recent Work of GAO in this Area," June 25.

The Brookings Institution's Conference for Business School Faculty Fellows, Washington, D.C., on the "Role of the General Accounting Office," June 26.

The Robert A. Taft Institute of Government Seminar for Lyndon Baines Johnson Congressional Interns, The American University College of Public Affairs, School of Government and Public Administration, Washington, D.C., on "The GAO: Congress' Fiscal F.B.I.," July 9.

The University of Texas at Arlington Colloquium of Department of Accounting, College of Business Administration, Arlington, Tex., on "Recent Developments in Financial Management, Congressional Budget Reform, and the General Accounting Office," July 22.

National Bar Association Convention, Chicago, on the "Outlook for the Black Lawyer in Government," July 25.

Following are recently published articles of the Comptroller General.

"The New Thrust of Internal Auditing in Government" (address presented July 3, 1973), *Institute of Internal Auditors 32nd Annual International Conference*, 1973.

"Performance Auditing in the Public Sector," American Management Associations *Managers' Forum*, June 1974.

"Survival of Higher Education in the Years Ahead" (address presented April 29, 1974, at the Association of Governing Boards of Universities and Colleges National Conference on Trusteeship), May/June 1974.

E. H. Morse, Jr., Assistant Comp-

troller General, spoke at the Civil Service Commission seminar on management of organizations at Oak Ridge, Tenn., June 20. His subject was "Program Evaluation—A View from GAO."

A. T. Samuelson, Assistant Comptroller General, addressed the Civil Service Commission Executive Seminar, Kings Point, New York, June 5, on "Evaluating Public Program Outcomes."

He was also reelected national treasurer, National Association of Accountants.

Office of the General Counsel

Paul G. Dembling, general counsel:

Participated in the 28th Annual Aerospace Industries Association Conference in Williamsburg, May 22–24.

Participated in a panel discussion and spoke on "Grants" before the American Bar Association National Institute, May 30.

Participated in meetings of the Administrative Conference of the United States, May 30–31.

Spoke before the National Contract Management Association on "Anatomy of a Bid Protest" at San Francisco, July 30–31.

Spoke before the Government Contract Claims Course, sponsored by The George Washington University and Federal Publications, Inc., on "Debarment, Suspension and Blacklisting" at Anaheim, Calif., August 8.

Participated in the American Bar Association convention in Honolulu, August 12–14.

Milton J. Socolar, deputy general counsel, spoke before the Institute for International and Foreign Trade Law, Georgetown University Law Center, on "GAO Activities," August 8.

Paul Shnitzer, associate general counsel, spoke before the American Bar Association convention on "Service Contract Act" in Honolulu, August 12–14.

Robert H. Rumizen, assistant general counsel, spoke before the Defense Advance Procurement Management Course on "Problems in Formal Advertising" at Fort Lee, Va., August 15.

Seymour Efros, assistant general counsel, spoke before the Defense Advance Procurement Management Course on "Problems in Formal Advertising" at Fort Lee, Va., June 10–11.

Howard S. Levy, senior attorney, spoke before the Federal Fire Council's Fire Services Seminar on "Review of Past Comptroller General Decisions Affecting Federal Fire Protection Support Agreements," June 10.

Office of Energy and Special Projects

Monte Canfield, Jr., director, participated as a panel member at the National Academy of Public Administration workshop on resource management on August 21.

J. Dexter Peach, associate director, spoke on the energy problem and its

implications for agriculture at the Area Director's Workshop of the Agricultural Research Service, College Park, Md., on June 27.

Mr. Peach and *James Duffus*, assistant director, participated in a meeting of the Energy Users Committee of the Business Roundtable in Washington, D.C., on August 7.

Federal Personnel and Compensation Division

Anthony J. Gabriel, assistant director, addressed the Civil Service Commission's Interagency Advisory Group Committee on Development and Training, May 17. His subject was "GAO's Perspective, Role, and Involvement in the Training and Education Area in the Federal Government."

Thomas A. Eickmeyer, supervisory auditor, addressed a Symposium on Use of Economic Analysis by Governmental Managers sponsored by the National Council of Associations for Policy Sciences with participation of the Defense Economic Analysis Council on May 21. The symposium was held at the Industrial College of the Armed Forces, Washington, D.C. Mr. Eickmeyer's subject was "Applications of Economic Analysis to Training Programs."

Harold E. Lewis, assistant director, spoke at the 33d Military Operations Research Society Symposium held at the U.S. Military Academy, West Point, N.Y., June 25. His subject was "Military Retention Incentives: Effectiveness and Administration." *Charles W. Thompson*, assistant director, was a cochairman of the Committee on Arrangements for the Symposium.

Financial and General Management Studies Division

Donald L. Scantlebury, director:

Spoke about the GAO audit standards at a Seminar for Head State Auditors sponsored by the Law Enforcement Assistance Administration. The seminar was held at the Interagency Auditor Training Center in Bethesda, Md., on May 1.

Chaired a panel on GAO's audit standards at the 1974 National Conference of the American Society for Public Administration held in Syracuse, N.Y., May 5–8. Other FGMS staff who contributed to this 4-day national conference on public administration included *Keith E. Marvin*, associate director, who chaired a panel on government program evaluation and presented a paper on the "Application of Management Science to Public Administration," and *Mortimer A. Dittenhofer*, assistant director, who was a discussant on the GAO audit standards panel.

Was appointed Chairman of the FGAA Financial Management Standards Board for 1974–75.

Was principal speaker at the charter-signing ceremony of the Southwestern Intergovernmental Audit Forum in Dallas on May 24.

Has been appointed to the National Council on Governmental Accounting which had its first meeting on

August 1 and 2. The Council is under the sponsorship of the Municipal Finance Officers Association. *Mortimer A. Dittenhofer* is Mr. Scantlebury's alternate on the Council.

Mr. Scantlebury's article entitled "The Structure of a Management Audit Finding," originally published in the March–April 1972 issue of *The Internal Auditor*, has been translated into Spanish and published in *Peru Control* No. 6 (September 1973), the journal of the Peruvian Comptroller General's Office.

Fred D. Layton, deputy director, spoke on GAO's audit standards at the annual meeting of the Minnesota Society of CPAs on June 7.

Richard Maycock, deputy director, was the keynote speaker on May 19 at the Professional Advancement Conference for Municipal Finance Executives, held by the School of Public Financial Administration, University of Wisconsin, Oshkosh, Wis. The conference was cosponsored by the Municipal Treasurers Association and the Municipal Finance Officers Association.

Harry C. Kensky, associate director, and *John J. Cronin, Jr.*, assistant director, conducted two workshops on "Communicating Audit Results to Management" at the 23d Annual Symposium of FGAA held in Dallas, June 19–21.

Keith E. Marvin, associate director:

Appeared as a speaker on measuring output at an economic analysis-program evaluation symposium sponsored by the National Council of Associations for Policy Sciences, May 20.

Appeared as a speaker and discussion leader on program evaluation at the Federal Executives Institute, Charlottesville, Va., June 19.

Appeared as a speaker on "Program Performance Standards and Techniques for Evaluating Effectiveness" at the annual meeting of the Southern Regional Conference, National Association of State Budget Officers, Morgantown, W. Va., June 14.

Co-authored an article with *James L. Hedrick*, assistant director, entitled "GAO Helps Congress Evaluate Programs." The article was published in "A Symposium: Program Evaluation," in the *Public Administration Review*, July–August 1974.

Joseph D. Comtois, assistant director, participated in a National Association of Accountants, Washington Chapter, seminar on "GAO's Efforts to Determine the Effect Social Services (HEW) Has Had in Helping Welfare Recipients Become Self-Supporting" on May 15.

Mortimer A. Dittenhofer, assistant director:

Conducted a seminar on May 1 for the Boston Chapter of the FGAA on using GAO's audit standards.

Made a presentation to the Seattle Chapter of FGAA on the relationships of the GAO audit standards and financial auditing on May 15.

Gave a presentation on May 16 to the Tallahassee Chapter of the Insti-

tute of Internal Auditors on conducting audits in accordance with GAO's audit standards.

Conducted a workshop session on Internal Auditing in the Accountability Process on May 22 in Columbus, Ohio, for the Ohio Society of Public Administration.

Participated in a preconference seminar on "Audit Practices in Local and State Government" by presenting and discussing case studies applying to auditing under the GAO standards on June 1 at the annual meeting of the Municipal Finance Officers Association in Las Vegas.

Made a presentation on June 15 to the North Carolina Association of CPAs on the GAO audit standards as applied to CPA audits of governments.

Was elected regional director of the Mid-Atlantic region of the Institute of Internal Auditors at the annual meeting in London, England, on July 7–11. As vice chairman of the National Government and Public Affairs Committee, he made a report to the assembled international association on the objectives, accomplishments, and plans of the Committee and conducted a workshop on Selling the Internal Audit to Government Management.

Ernest H. Davenport, assistant director:

Conducted a seminar at the Interagency Auditor Training Center, Bethesda, Md., on the GAO audit standards, on May 6–7.

Attended the Municipal Finance Officers Association annual meeting in Las Vegas and presented a paper entitled "Towards Generally Accepted Auditing Standards For Government," on June 6.

Served as a panel member at a workshop on Case Studies of Actual State and Local Government Audits at the 23d National FGAA Symposium in Dallas on June 20–21.

Kenneth W. Hunter, assistant director, and *James K. Kardokus*, supervisory management analyst, discussed information support aspects of GAO's new responsibilities under the Congressional Budget and Impoundment Control Act of 1974, at the FGAA National Symposium in Dallas on June 21.

Mr. Hunter addressed the National Computer Conference on GAO's efforts to develop principles and standards for cost accounting and cost control for computer-based information systems on May 7 in Chicago.

William E. Parker, assistant director, spoke on the responsibilities of certifying officers at the Law Enforcement Assistance Administration's Regional Financial Personnel Conference on June 12.

Robert J. Ryan, Sr., assistant director:

Participated in a workshop on Federal Grant Financial Management sponsored by the Federal Regional Council, Kansas City, on May 23–24.

Addressed a faculty seminar on Opportunities in the Accounting Profession—the Public Sector, sponsored jointly by the Texas Society

of Certified Public Accountants and the American Institute of Certified Public Accountants in Dallas, on June 6.

Earl M. Wysong, Jr., assistant director:

Was awarded the 1973–74 System Man of the Year award for outstanding contributions to the systems profession by the Patuxent Chapter of the Association for Systems Management on May 4.

Made a presentation on July 31 at a seminar sponsored by the Washington Chapter of FGAA in Washington, D.C., on the participatory approach to accounting system development.

Paul S. Benoit, supervisory computer systems analyst, was awarded the 1973–74 Service Award by the Patuxent Chapter of the Association for Systems Management on May 4.

James K. Kardokus, supervisory management analyst, was elected vice chairman of the Federal Information Requirement Management Council for the forthcoming year.

Otis C. Luttrell, supervisory auditor, participated in a seminar at the Interagency Auditor Training Center in Bethesda, Md., on the GAO audit standards on May 7.

International Division

Eugene C. Wohlhorn and *Frank M. Zappacosta*, assistant directors, conducted a seminar on "Operational Audits of Technical Assistance Projects in Developing Countries" on May 28 at the United Nations Headquarters in New York for 38 staff members of audit groups with the United Nations system.

Terry A. Kremer, audit manager, European Branch, discussed the functions of GAO and their relationship to agency internal audits at an Army internal review symposium conducted by Headquarters, U.S. Army, Europe, in Heidelberg, Germany, on June 5.

Logistics and Communications Division

Fred J. Shafer, director, and *Fred L. Haynes*, assistant director, participated in symposiums on computer-assisted design and manufacturing at the Massachusetts Institute of Technology in Cambridge on June 6 and in one sponsored by the Air Force in Chicago on June 19–20.

Mr. Shafer addressed the Air Force Advanced Controller's Course at Maxwell Air Force Base in Montgomery, Ala., on May 13 on the "GAO Role in Evaluating Management in the Department of Defense."

Robert G. Rothwell, deputy director, addressed the 13th Annual Federal Records Managers Conference, Annapolis, Md., on May 20, on "GAO's Interest in Records Management." Mr. Rothwell also participated in the 26th Annual Current Strategy Forum of the Naval War College, Newport, R.I., on June 25–27. The theme for the 1974 forum was "Scarce Resources—Source of Future Conflict?" The participants included the 450 officer-students attending the 10-month courses given at the

college and about 150 civilian and military guests.

Bernard W. Sewell, assistant director, attended the Executive Program in Business Administration at the Columbia University Graduate School of Business in New York from June 9 through July 20.

Fred Haynes, assistant director, has been elected vice president, Region II, American Institute of Industrial Engineers.

Clarence O. Smith, assistant director, assisted in founding the National Capital Area Chapter of the EDP Auditors Association on May 7.

Richard A. Helmer, audit manager, addressed the Defense Disposal Management Seminar at the U.S. Army Logistics Management Institute, Fort Lee, Va., on June 12. Mr. Helmer discussed the results of GAO's work and recent reports on improving Department of Defense property disposal operations.

Wilbur W. Bailey, audit manager, participated in a Loran C (Radionavigation) Workshop at Gettysburg, Pa., June 4–7. The workshop was sponsored by the U.S. Coast Guard to seek improved ways for implementing Loran C as a national radionavigation system for the maritime community. Mr. Bailey's contributions related to the national-international aspects of the system.

Manpower and Welfare Division

Gregory J. Ahart, director, was elected Program Director, Washington Chapter, National Association of Accountants, for the chapter year 1974–75. Mr. Ahart also participated in the University of Utah/National Manpower Policy Task Force Manpower Conference, held at the Snowbird Resort near Salt Lake City, Utah, on July 31 through August 2.

Dean K. Crowther, deputy director, served as instructor of a course entitled "Planning and Programming Audits and Reviews" at the Interagency Auditor Training Center in Washington, D.C., on May 8.

As a member of the AICPA Legislative Action Committee, Mr. Crowther revised the Institute's *Campaign Treasurer's Handbook*, published in June 1974. (See p. 75.)

Harold Stugart, assistant director, and *Patrick Daly*, supervisory auditor, briefed the Manpower Subcommittee of the National Advisory Council on Education Professions Development on GAO's "Review of the Relationship of Federal Teachers Training Programs to Teacher Supply and Demand" (B–164031(1), Mar. 6, 1974). The briefing was held in Washington, D.C., on June 5.

Mr. Stugart was elected vice president for Education and Professional Development of the Washington Chapter, National Association of Accountants, for the chapter year 1974–75.

Robert J. Tice, supervisory auditor, attended the Public Program Management Seminar, Executive Seminar Center, Berkeley, Calif., from July 21 through August 2.

David Zylks, supervisory auditor,

conducted two workshops for Upward Bound project directors during a regional conference sponsored by the U.S. Office of Education at Columbia University in New York City on May 30, 1974. The subject of the workshops was GAO's recent report to the Congress on "Problems of the Upward Bound Program in Preparing Disadvantaged Students for a Postsecondary Education" (B–164031(1), Mar. 7, 1974).

Procurement and Systems Acquisition Division

Richard W. Gutmann, director:

Made a presentation on "The Role of the Procurement and Systems Acquisition Division of the GAO" to the procurement majors in a class of the graduate logistics program at the School of Systems and Logistics, Air Force Institute of Technology, Wright-Patterson Air Force Base, Ohio, June 14.

Addressed the Materials Procurement Seminar of the Electronic Industries Association on GAO and Government attitudes, reactions, and guidance for contractors who are faced with unpredictable inflationary pressures and shortages of materials, in Washington on June 26.

Robert B. Hall, Jr., assistant director, made a presentation at the Defense Procurement Executive Seminar covering the Procurement Commission's recommendations with particular emphasis on the major systems area, in Washington on April 29.

Timothy D. Desmond, supervisory management analyst, authored an article entitled "Duplication in Weapons" which was published in the weapons technology section of the May–June 1974 issue of *National Defense* (formerly *Ordnance Magazine*).

C. William Moore, Jr., supervisory auditor, was recently elected to serve as the Director for Special Activities for the Washington, D.C., Chapter of the National Association of Accountants. This will be Mr. Moore's fourth year as a member of the Board of Directors for the Washington Chapter. He has served 2 years as the Director of Member Attendance and 1 year as the Director of Member Acquisition.

Resources and Economic Development Division

Henry Eschwege, director, addressed the 1973–74 Conference for Business Executives on Federal Government Operations, sponsored by The Brookings Institution, on June 3.

Frank V. Subalusky, assistant director, was appointed to the National Committee on Socio-Economic Programs, National Association of Accountants, for 1974–75. He also was selected by the Washington Chapter NAA to receive the 1973–74 Socio-Economic Distinguished Service Award for his outstanding contribution to a national program that was developed by NAA to render assistance at the local level to disadvantaged small businessmen.

Thomas D. Reese, supervisory auditor, participated in a panel discussion on May 3 with the individuals taking

part in the 1974 Intergovernmental Affairs Fellowship Program.

Field Operations Division

Marvin Colbs, regional manager, Atlanta, was elected president of the Atlanta chapter of FGAA for fiscal year 1975.

William J. Schad, assistant regional manager, and *Lee M. Stevens*, audit manager, Chicago, were elected president and secretary, respectively, of the Chicago chapter of FGAA for fiscal year 1975. *James J. Finn*, supervisory auditor, Chicago, and chapter membership chairman for fiscal year 1974, was presented with a certificate of appreciation by the FGAA National Office for his efforts in the FGAA 1974 Membership Improvement Program. Mr. Finn planned and conducted a highly successful membership campaign which earned a cash award for the Chicago chapter.

W. H. Sheley, Jr., regional manager, Dallas, presided over a May 24 meeting of the Southwest Intergovernmental Audit Forum. This meeting, held in Dallas, was convened to charter the association.

Paul C. deLassus, assistant regional manager, Dallas, participated as a speaker and a discussion panel member in a workshop conducted May 28 by the Criminal Justice Division, Office of the Texas Governor. The discussions dealt with program evaluation and the need to establish definitive program goals and objectives.

David A. Hanna, assistant regional manager, Denver, addressed the Pikes Peak Chapter of the American Society of Military Comptrollers in Colorado Springs, Colo., on May 8. His subject was "The Work of the GAO Today."

Milo L. Wietstock, assistant regional manager, Detroit, spoke at the June 1974 meeting of the Detroit Chapter of FGAA. He discussed some of the operations and programs of the Los Angeles chapter, of which he is a former member, that might be useful to the Detroit chapter.

William F. Laurie, audit manager, Detroit, was selected professional development coordinator of the Ohio Society of CPAs.

Marion A. Becker, auditor, Cleveland suboffice, was chosen "Woman of the Year" by the local chapter of the American Business Women's Association.

The following members of the Detroit region were selected as officers of FGAA for fiscal year 1975:

Detroit chapter—*Charles D. Allegrina*, supervisory auditor, president; *Robert T. Rogers*, supervisory auditor, secretary; and *Francis P. Mioni*, supervisory auditor, membership chairman.

Cleveland chapter—*Mary Beth Celebrezze*, supervisory auditor, president; *Theodore F. Boyden*, supervisory auditor, treasurer; *Albert A. Simonic*, supervisory auditor, treasurer; and *John A. Dowell*, assistant regional manager, director.

J. T. Hall, Jr., regional manager, Los Angeles, was appointed to serve on the Policy Committee of the Los Angeles

Federal Executive Board for fiscal year 1975.

Edwin J. Kolakowski, assistant regional manager, Los Angeles, participated in a conference on Educational Program Audits, May 22, in Los Angeles. Issues discussed included the necessity for a certifying agency for educational program auditors.

On May 24, *Frederick Gallegos*, management auditor, and *Alfred Alvarado*, auditor, Los Angeles, participated in a panel discussion before a group of students and instructors at Rio Hondo Junior College. The subject of the panel discussion was "Job Opportunities Available in Federal Agencies."

The following members of the Norfolk region were elected officers of the Hampton Roads chapter, National Accountants Association, for fiscal year 1975:

Walter H. Henson, regional manager, Director of Programs; *Thomas Stevenson*, supervisory auditor, Director of Professional Development; *Ronald Maccaroni*, supervisory auditor, Director of Public Relations; and *Dudley Roach, Jr.*, supervisory auditor, Associate Director of Professional Development. In addition, Mr. Stevenson was appointed alternate delegate to the association's Virginia Council.

Francis X. Fee, assistant regional manager, Philadelphia, participated in a discussion on the Merits of the Executive Interchange Program at the May 31–June 1 meeting of the Presidential Interchange Executive Association in Washington.

Douglas E. Cameron, supervisory auditor, Seattle, was elected a director of the Portland chapter of FGAA. Mr. Cameron was also appointed a member of the Oregon State Society of CPAs' Government Accounting and Auditing Committee, both for the 1974/1975 program year.

Joanne M. Sylvis and *E. Dennis Gutknecht*, supervisory auditors, Seattle, participated in a Women's Job Fair program at the University of Washington, April 10–11. Their discussion centered around career opportunities for women college graduates in GAO.

G. Robert Murphy and *E. Dennis Gutknecht*, supervisory auditors, Seattle, presented a case study on management auditing at a dinner meeting of the University of Washington's Beta Alpha Psi Accounting Fraternity, April 30. About 75 students and faculty attended.

New GAO Attorneys Recently Admitted to the Bar

Cornwell G. Appleby	District of Columbia
Alan N. Belkin	District of Columbia
Michael J. Boyle	Florida
Charles L. Brown	Georgia
John M. Burns	District of Columbia
Bruce H. Cherkis	Pennsylvania
Donald A. Epstein	Massachusetts
Robert M. Gellman	Pennsylvania
Bruce Goddard	District of Columbia
Jacquelyn A. Goff	Illinois
Dayna Kinnard	District of Columbia
Robert P. Murphy	District of Columbia
Steven E. Murray	Pennsylvania
Elizabeth Y. Pugh	Pennsylvania
James A. Spangenberg	Maryland
James J. Stanford	District of Columbia
Brent G. Wolmer	District of Columbia

The following new professional staff members reported for work during the period May 16, 1974, through August 15, 1974.

Financial and General Management Studies Division	Aliferis, Peter V.	Boston University
	Byrne, Edith J.	University of Tennessee
	Danner, Ronald P.	Pennsylvania State University
	Doyle, Christopher	University of Rhode Island Graduate School
	Mycka, Ronald D.	Parsons College
	Palmer, Carl R.	Tulane University
	Potter, Joseph H.	Maryland State Highway Administration
	Rurak, Marilyn	Department of the Army
	Thompson, Bruce W.	Department of Health, Education, and Welfare
	Winne, Kenneth M.	Department of the Army
Federal Personnel and Compensation Division	DiCarlo, Vincent A.	U.S. Navy
Office of Energy and Special Projects	Canfield, Monte E., Jr.,	The Energy Policy Project of the Ford Foundation
	Dugan, Dennis J.	University of Notre Dame
	Sprague, John W.	Department of the Interior
Office of the General Counsel	Browne, Charles L., III	University of Georgia
	Merson, Edgar G.	Select Committee on Small Business
	Przybylek, Charles S.	National Aeronautics and Space Administration
	Taylor, William L.	United States Senate Select Committee on Presidential Campaign Activities
General Government Division	Loew, Solomon B.	U.S. Postal Service

Office of Joint Financial Management Improvement Program	Millstein, Herbert S.	Marketing Sciences Corporation
Logistics and Communications Division	McKenzie, Robert G.	U.S. Air Force
	Podell, Harold J.	The Mitre Corporation
Manpower and Welfare Division	Berez, Maurice R.	Touche Ross & Co.
	Gainor, Charles M.	National Science Foundation
	Qvale, Frederick G.	U.S. Air Force
	Walker, Junius F.	Engineering Science Inc.
Office of Policy and Program Planning	Blackerby, Phillip S.	University of Texas
Procurement and Systems Acquisition Division	Delicce, Michael F.	U.S. Air Force
	Megyeri, Leslie L.	Department of Transportation
Transportation and Claims Division	Alexander, Nancy L.	University of North Carolina
	Shute, Carol L.	University of Maryland
Washington Headquarters Division Career Group	Allen, Gerald C.	Federal City College
	Anderson, William J., Jr.	Widener College
	Baker, Carl L.	University of South Carolina
	Bissett, Sharon K.	Fairmont State College
	Brletic, Celeste R.	West Virginia University
	Brown, Joseph C.	Lincoln University
	Browne, Stephanie S.	Miami University
	Buzas, Paul J.	Drexel University
	Cannon, Doris E.	University of North Carolina
	Cattano, Barbara K.	West Virginia University
	Cekala, Sharon A.	George Mason University
	Christiansen, Victor J., Jr.	Lincoln University
	Clarke, Kenneth F.	University of Tennessee
	Conte, Francis M.	St. Vincent College
	Costello, John P.	Temple University
	Covington, Betty R.	Knoxville College
	Crissman, Christopher C.	Bloomsburg State College
	Davison, David F.	Duquesne University
	DeCrappeo, Anthony P.	Pennsylvania State University
	Denion, Susan M.	Pennsylvania State University
	Dentinger, Carlton P.	Morgan State College
	Dino, Michael P.	University of Connecticut
	Dowdal, William J.	University of Minnesota
	Doyle, Daniel M.	University of Connecticut
	Farrell, Martin W.	LaSalle College
	FitzHugh, Cary G.	Duke University
	Fleener, Allen C.	University of South Carolina

Washington Headquarters Division Career Group (Continued)

Fowlkes, Pauline C.	Virginia State College
Gauss, Siegfried J.	LaSalle College
Glover, Cathy E.	Hampton Institute
Gomez, Barney L.	University of Baltimore
Graveline, William R.	Bryant College
Graves, Toni A.	Tennessee State University
Greene, Richard M.	University of Rochester
Greishaw, William R.	Gannon College
Groves, Charles D.	University of Maryland
Gruber, Charles F., Jr.	West Virginia University
Hackett, Truman, Jr.	Mississippi Valley State College
Hand, David J.	Carnegie-Mellon University
Handy, Richard M.	Bowie State College
Hansen, John C.	University of Rhode Island
Harmon, Robert L.	University of Hawaii
Hartz, Robert C.	Duquesne University
Holthaus, Rhonda K.	Creighton University
Ingram, Jacquelyn D.	Fayettville State College
Ipock, Rachel H.	East Carolina University
Isrin, William N.	Bryant College
James, Brenda R.	Bowie State College
Kane, Ronald J.	St. Joseph's College
Kennedy, Michael J.	St. Francis College
Korman, Timothy J.	Virginia Polytechnic Institute
Kudla, Eugene	Pennsylvania State University
Kyte, Larry A.	East Tennessee State University
Lebo, John C., Jr.	Pennsylvania State University
Lee, Jeffrey A.	Lake Superior State College
Lehrman, Steven J.	Lehigh University
Lewin, James E., Jr.	University of Maryland
Little, Mark A.	Fairmont State College
Lowry, Ralph L.	Duquesne University
Lyle, Larry	Syracuse University
Lyons, William R.	West Virginia University
McGovern, Thomas D.	LaSalle College
McMahon, Paul C.	Clarion State College
Martin, Peter E.	University of South Carolina
Messenger, Barbara J.	Lake Superior State College
Miller, Juliann	University of Virginia
Mills, Thomas E.	University of Michigan
Munch, Donald F.	University of Scranton
Neuendorffer, Jean W.	University of Pennsylvania
Ng, Joyce N.	College of William and Mary
Numbers, Randy S.	George Mason University
Ottenheimer, Edward G.	Temple University
Papineau, Frank A., Jr.	Bryant College of Business Administration
Petko, Joseph A.	Moravian College
Phillips, Donald L.	University of Tennessee
Pufahl, Yvonne C.	University of Delaware
Reed, James C.	Clarion State College
Ridgley, Gwendolyn S.	University of Maryland

Washington Headquarters Division Career Group (Continued)	Ritchey, Randall H.	Pennsylvania State University
	Roche, Edward J., Jr.	University of Notre Dame
	Ross, Benjamin C.	Shaw University
	Samaha, Joan M.	George Mason University
	Samuels, Jo Ann	Rider College
	Santee, Milton C.	West Virginia State College
	Schollenberger, George M.	Middle Tennessee State University
	Semick, Daniel J.	American University
	Smith, Eda J.	D.C. Board of Trade
	Snavely, George W., Jr.	Pennsylvania State University
	Snyder, Barry R.	West Virginia University
	Snyder, John P.	Pennsylvania State University
	Spiecker, Joseph A.	St. Joseph College
	Stewart, Derek B.	Morgan State College
	Stulginsky, Edward M.	University of Scranton
	Swingler, Lance R.	Shaw University
	Tavares, John J., Jr.	University of Utah
	Thompson, Ronald L.	Madison College
	Trochelman, Glen	Lake Superior State College
	Wittenburg, Darryl L.	Gannon College
	Yospe, Jay	University of Baltimore
	Yucas, Ronald S.	Bloomsburg State College

REGIONAL OFFICES

Atlanta	Artesiano, Mario L.	University of Florida
	Brignoni, Lourdes M.	University of Puerto Rico
	Davenport, Ronnie H.	Atlanta University
	Harpp, Jacqueline	Morris Brown College
	Jones, Carolyn A.	Mississippi State College for Women
	Knox, Cynthia A.	Florida A & M University
	Long, Mary B.	Florida Atlantic University
	Massey, Donna C.	Mississippi State University
	McCord, Fannie L.	Morris Brown College
	Mitchell, Donna K.	Florence State University
	Nanney, James D.	Mississippi State University
	Owens, Thomas E.	University of Alabama Graduate School
	Parkman, Grace C.	University of Alabama
	Shannon, Donald C.	University of Alabama
	Sheely, Harold R., Jr.	University of Mississippi
	Shuford, Gary L.	Western Carolina University
	Smith, Ronald L.	Georgia Institute of Technology
	Smith, Sharon K.	Valdosta State College
Boston	Benson, Frank M., Jr.	Bentley College
	Hansbury, James W., Jr.	Northeastern University
	O'Malley, Mark K.	Southeastern Massachusetts University

Regional Offices (Continued)

	Sweeney, Paul A.	Babson College
	Winter, Kenneth J.	University of New Hampshire
	Wright, Robert A.	University of Massachusetts
Chicago	Bellino, Sam N.	DePaul University
	Blackwell, Gwenetta A.	Roosevelt University
	Gautney, Patricia D.	Chicago State University
	Hardin, George C.	Roosevelt University
	Kittler, Donald J.	DePaul University
	Kolar, Roger E.	University of Illinois
	Moultrie, Enchelle D.	Northern Illinois University
	Ray, Terrence M.	DePaul University
	Rousseau, Mireille J.	Chicago State University
	Smolik, Cynthia L.	University of Minnesota
	Young, David L.	University of Minnesota
Cincinnati	Adair, Perry M.	Indiana University
	Curro, Michael J.	Ohio University
	Hixson, Sue E.	Indiana University
	Jackson, Arlin E.	Central State University
	McClary, Deborah Y.	Wilberforce University
	Press, James N.	Indiana University
Dallas	Ayala, Alberto	Troy State University
	Castanon, Barbara A.	Southwest Texas State University
	Cowan, Danny R.	Stephen F. Austin State University
	Cyganowski, Walter R.	University of Texas at Arlington
	Davis, Patricia G.	University of Texas
	Doutel, Gregory J.	University of Texas at Austin
	Easley, Bruce K.	University of New Orleans
	Hoffman, Michael W.	Miami University
	Larson, Winston D.	Stephen F. Austin State University
	Mihalski, Edmund J.	University of Arkansas
	Sato, Gordon L.	University of Texas at Austin
	Zamudio, Guillermo G.	Texas A & I University
Denver	Bunting, John S.	University of Colorado
	Craig, Jeffrey D.	University of Denver
	Drake, Randall G.	Weber State College
	Gibbs, Susan	Brigham Young University
	Gonzales, Floyd A.	University of Colorado
	Graesser, Russell A.	Black Hills State College

Regional Offices (Continued)

	Hansen, Holly A.	University of Colorado
	Kruse, Sally B.	University of Nebraska at Omaha
	Samores, Robert J.	Wichita State University
	Spence, John A.	Colorado State University
	Steiner, Alan A.	University of Utah
Detroit	Fucinari, Sharon L.	University of Detroit
	Long, Alfred C.	University of Detroit
	Nelson, Benjamin F.	Albany State College
	Stochl, Lawrence W.	Cleveland State University
Kansas City	Archer, Nancy E.	University of Kansas
	Hall, Cynthia K.	Northeast Missouri State University
	Seely, Robert R., Jr.	Wichita State University
Los Angeles	Berg, Kenneth D.	California State University
	Bornhop, Gretchen E.	California State University
	Coffin, Howard J.	California State College
	Cronk, Richard A.	University of California at Los Angeles
	Crow, Todd C.	California State University
	Franklin, Michael J.	California State University
	Gurule, Mary R.	North Texas State University
	Hamilton, Roger L.	University of Southern California
	Hollis-Brau, Robert E. L.	California State University
	Iler, Patrick A.	Arizona State University
	Lannen, Larry P.	University of California
	McVeigh, John D.	California State University
	Olivares, Olivia A.	American Graduate School of International Management
	Roberts, Kenneth H.	University of California at Los Angeles
	Vindigni, George	California State University
	VanWagner, Samuel S.	California State University
New York	Byrd, Tonimaria N.	Norfolk State College
	Carlo, Anthony R.	St. John's University
	Davis, Leonard	City University of New York
	Eisenberg, Stephen R.	New York University
	Gabriel, Nicholas	Hunter College
	Griffin, Edwin B.	University of Southern California
	Kalinowski, Rosemarie	St. John's University
	Kleinwaks, Jonathan T.	Syracuse University
	Perillo, Mary L.	College of Mt. St. Vincent
	Piscitell, Samuel F., Jr.	Iona College
	Wheeler, Laurene A.	College of New Rochelle

Regional Offices (Continued)

Norfolk	Beusse, James R.	University of North Carolina
	Bookert, Theresa D.	Hampton Institute
	Ellis, John B.	Department of the Navy
	Paul, Despo P.	College of William and Mary
	Powell, Durwood R.	University of North Carolina
	Rice, Christopher M.	East Carolina University
	Underwood, Randall A.	University of North Carolina
Philadelphia	Bailey, Irving D.	Cheyney State College
	Dieter, Linda M.	Drexel University
	Foley, Frank J., Jr.	Villanova University
	Meehl, Richard W.	Pennsylvania State University
	Pasquarello, David B.	Drexel University
	Whalen, Karen C.	Temple University
	Zimmer, Frederick A., Jr.	University of Pennsylvania
San Francisco	Cannon, Mona P.	Stanford University
	Fu, Paul D.	University of Hawaii
	Hendrickson, Steven M.	California State University at Chico
	Mandel, William J.	Rutgers Graduate School of Business Administration
	Marr, Thomas L.	Department of the Air Force
	Martorelli, Joseph P.	California State University
	Rosenbaum, Robert P.	California State University at Hayward
	Wagner, Paul T., Jr.	San Jose State University
	Wright, Karen D.	California Polytechnic State University at San Luis Obispo
Seattle	Brandt, Alfred A.	University of Oregon
	Colvo, Steven N.	University of Alaska
	Connolly, David K.	Seattle Pacific College
	McIntosh, Warren R.	University of Oregon
	Pazina, Susan L.	University of Puget Sound
	Rivers, Ricky D.	Central Michigan University
	Sugimura, Richard H.	Oregon State University
	Tomlinson, Gary L.	University of Washington
	Uberuaga, David V.	University of Idaho
	Wendel, Lynda G.	University of Oregon
Washington (Falls Church)	Angle, Eileen	Bucknell University
	Barrett, Joe N.	George Washington University
	Cannon, Douglas S.	University of North Carolina
	Davis, Dorothy L.	American University
	Duquette, Dennis J.	Coopers & Lybrand
	Gutierrez, Thomas	University of Maryland
	Hargis, Beverly A.	Mary Washington College

Regional Offices (Continued)

Holman, Barry W.	Virginia Commonwealth University
Hsing, Helen H.	University of Maryland
Jefferson, Leslie M.	Howard University
Knauff, Brian A.	West Virginia Wesleyan College
Lavigna, Robert J.	George Washington University
McIntyre, Donald D.	University of Virginia
Moy, David K.	George Washington University
Parle, James V.	Bernard M. Baruch College
Poll, Wayne R.	George Washington University
Ransom, Curtis E.	Virginia Commonwealth University
Schwartz, Stuart D.	American University
Slawinski, Casimir	George Mason University
Smith, Nora J.	Shepherd College
Stone, William R.	West Virginia Wesleyan College

Readings of Interest

The reviews of books, articles, and other documents in this section represent the views and opinions of the individual reviewers, and their publication should not be construed as an endorsement by GAO of either the reviewers' comments or the books, articles, and other documents reviewed.

Assets—Accounting and Administration

By William A. Paton and William A. Paton, Jr.; Roberts & Roehl, Inc. (30500 Van Dyke Ave., Warren, Mich. 48093), 1971; 536 pp., hardback, $9.

This book is a good reference work on the general subject of accounting for resources. It was written primarily from the standpoint of accounting in private business enterprise, but government accountants can profit greatly from reading many parts of the book.

Apparently the book has not received a great deal of attention, at least in the way of published reviews, since its publication in 1971. It is a revision of an earlier book, published in 1952, entitled "Asset Accounting." One review appeared in the July 1973 issue of *The Accounting Review*. Those interested in reading a brief analysis of the book in relation to the 1952 version are referred to that review.

The book is not a complete text on accounting since it is devoted primarily to the accounting and administration of assets. However, major subjects discussed are also pertinent to accounting in government operations; e.g., long-lived assets and their depreciation and inventories.

Most accounting texts are rough reading. This one stands out as one of the more readable ones. For those (like this reviewer) who studied under the senior author or those who are otherwise familiar with his accounting philosophy and writings, there are few surprises in the book. But even for these persons and for others interested in the subject, the book is a good refresher in the basics of accounting for resources and their management as well as a good literary effort.

The lucid reasoning processes and the articulate way in which accounting problems and alternative solutions are

presented make for a pleasant change of pace in reading accounting literature. Also, the writing is sprinkled here and there with some colorful expressions, which are somewhat of a rarity in accounting writing (for example, "A sloppy and inefficient management, that fritters away opportunities to improve earnings, is not to be commended" and "muddled and unsupportable presentations").

The authors' viewpoint basically is one of rejecting arbitrary and hard and fast rules for accountants and urging them to look closely and carefully at a problem and then decide how best to account for it. This is in contrast to today's strong pressures for more uniformity in accounting methods without much regard to varying circumstances.

As is to be expected of the authors, the book presents a strong case for price level accounting for assets. The discussion of this complex subject is even more pertinent in the light of the accelerated rate of inflation that has taken place since the book was written.

In discussing this subject at one point, the authors chide practicing accountants who insist on meticulously translating data expressed in foreign currencies into U.S. dollars but who are reluctant, if not opposed, to applying the same conversion reasoning to the dollar measurement of assets where the monetary yardstick has substantially changed because of inflation and the passage of time. The authors observe:

> But when it comes to dealing with different generations of domestic dollars, recorded in the accounts over a period of years, most accountants seem to have no trouble in overlooking the varying values of the units in which the data are expressed.

The book is superior to many accounting texts in that it deals not only with accounting for resources but also their management. For example, it contains good discussions on make-or-buy decisions and productivity analyses relating to investments in new plant and equipment.

At one point the authors take issue with the common practice in corporate financial reporting of changes in financial position that reflects depreciation changes as a source of generated funds. They make the down-to-earth point that "It should be made clear that it is receipts from customers—the revenue stream—that constitutes the in-flow of funds from operating activity." GAO has been a strong proponent of this viewpoint for many years in the preparation of financial reports of Government-operated business-type activities.

I recommend this book as a valuable reference source—the kind one likes to turn to in mulling over an accounting problem since the reasoning processes laid out in the book are often helpful in clarifying one's thinking.

E. H. Morse, Jr.
Assistant Comptroller General

Evaluating the Impact of Manpower Programs

Edited by Michael E. Borus, Lexington, Mass.; D.C. Heath, 1972; 280 pp.; $15.

The long-awaited advent of manpower revenue sharing transfers from

the Federal level to hundreds of State and local governments much of the authority for planning, operating, and—most important for present purposes—evaluating hundreds of millions of dollars worth of manpower training and work support programs.

Federal officials and contractors have amassed considerable expertise in program evaluation over the past dozen years. (Indeed, the conference which constituted the basis for this book was sponsored by the Department of Labor, and nearly all of the contributors were Federal officials or contractors.) The decentralization of evaluation responsibility magnifies the importance of books which can transmit this accumulated experience.

This edited volume is Professor Borus' second contribution to the growing literature on the issues and techniques of evaluating the consequences of manpower programs. His first book, "Measuring the Impact of Manpower Programs: A Primer," coauthored by William R. Tash, was published in 1970. It is a competent, brief overview of the field, covering specification of program objectives, definition and measurement of costs and successes, and a combination of these measures. The authors address the beginner and concentrate on basic techniques rather than on theoretical issues.

Professor Borus' second work ranges more widely and deeply. The 20 chapters and 16 participants' comments include material on designing an evaluation system, including cross-program comparisons; choosing appropriate control groups; designing survey instruments; measuring noneconomic impact on health, education, crime, and the community; finding hard-to-locate respondents; and measuring secondary labor market effects of manpower programs. In addition, several sources of economic data are identified, including the Department of Labor's Manpower Administration and Unemployment Insurance Service, the Internal Revenue Service, the Social Security Administration, and federally-financed national longitudinal (so-called Parnes) surveys; but this data is better suited to evaluation on a national, rather than State or local, scale.

Paradoxically, the evaluators, many of whom are economists, seem generally loath to treat evaluation itself as an economic good—to consider what, how, and for whom programs should be evaluated. Extreme examples of this myopia are attributing sanctity to benefit-cost ratios and allowing evaluation to become an exercise in history instead of an ongoing program operation. This problem, however, by no means detracts from the volume's considerable merits.

The articles reveal how much has been accomplished in evaluation and, at the same time, how much remains to be done. In 1974 we celebrate 12 years of the Manpower Development and Training Act, 10 years of the Economic Opportunity Act, and their incorporation into the new Comprehensive Employment and Training Act. Thus, it is an apt time to reconsider not only the programs themselves but also their evaluation. As Garth Mangum and Thayne Robson conclude:

> Manpower program evaluation is still in its infancy. Most of the other social programs

have thus far avoided serious evaluation. It is a credit to the Congress and to federal administrators that the art and practice of manpower program evaluation has progressed to the point that this conference could have been held.

David Marwick
Management Analyst
Manpower and Welfare Division

The Design of Production and Inventory Systems For Multi-facility and Multi-warehouse Companies

By Harvey M. Wagner, Yale University and McKinsey and Co.; *Operations Research*, March–April 1974.

This article lists a comprehensive set of questions whose answers characterize the complete design of combined production and inventory systems. A three-phase program is outlined for conducting an inventory and production systems analysis, design, and implementation project. The paper treats in some detail the component steps to be followed at each phase, the management functions that must be included in a workable design, and the usefulness of operations-research techniques in such computer-based systems.

Though the suggested approach is a synthesis of several recent applications in large-scale manufacturing companies, many of the issues brought forward in the article are very relevant to GAO's efforts toward analyzing inventory distribution systems in the Federal Government. Mr. Wagner's outline of the major steps that must be followed in designing and implementing an improved production and inventory-planning system could very well be an outline to be followed by GAO auditors in reviewing a Federal inventory distribution system.

To begin, the author poses a set of basic questions that must be answered in order to describe completely the system under study. The questions are aimed at manufacturing companies, but are still very much related to Federal supply systems. For example, one could change a word such as "sales" to a word such as "demand" and a question would become relevant to GAO work. Seeking answers to these or similar questions would be a good starting point for a comprehensive audit of an inventory distribution system.

The nine sets of questions that must be answerable at any arbitrary moment are:

1. How much of each product is to be manufactured over the entire planning horizon used by the organization?
2. When is the plant to produce each individual item, on what facility or equipment, and in what amount?
3. When are raw materials to be ordered and in what quantities? How are shortages removed?
4. How much inventory buildup of each individual item is planned in anticipation of future peak sales?
5. During each time interval, what are the target inventory levels for all the items at every stocking point within the system?

6. If customer orders exceed stock availability at any time, who is allocated the available supply? How are the backlogs managed?
7. What recordkeeping, status-reporting, and cost-gathering information systems are required to provide the data inputs for the production and inventory planning system?
8. When and under what circumstances are the plans subject to revision?
9. Who in the organization is responsible for setting management policy governing the answer to all the preceding questions?

The article suggests that, once the system has been completely described by obtaining answers to the above questions, a systems study can then be undertaken in three distinct phases: diagnosis, redesign, and implementation.

Phase I: Diagnosis

Mr. Wagner maintains that the first phase of a systems study is to assess whether there exist sufficient improvement opportunities over the current system to warrant the cost of developing and installing a new system. This is a diagnostic task involving an examination of the current system to determine where better information and better coordination among decisionmakers would lower the company's (or agency's) costs and improve its service. Wagner cites as an example the frequent diagnosis that inventory levels are too high at various stocking points. The savings from reducing these inventory levels will occur only once—when the inventories are diminished—and hence may be obtainable by a special one-time program that is aimed solely at the purpose of inventory reduction. No system design is necessary. However, in a company where the current production and inventory system operates badly, as evidenced by high inventories of some items, too frequent stockouts of other items, a large number of revisions in scheduled production quantities, and high transportation and warehousing costs due to poor forward planning, the most attractive remedy often is a complete redesign of the entire system.

In this diagnostic phase of study, Mr. Wagner has found the tools of statistical and economic analysis helpful in demonstrating current inefficiencies and estimating possible monetary benefits.

Phase II: Redesign

Assuming that the outcome of the initial diagnostic phase is the recommendation to redesign the entire system, Wagner's second phase of a systems study would provide a new system's design. This design phase should consist of five major steps:

Step 1: Use a graphic descriptive presentation, or an equivalent, to capture the essential management processes required by the new system.

Step 2: Specify in realistic terms the management functions to be performed.

Step 3: Select the approaches for

carrying out these management functions.

Step 4: Define the information files to be used by decision makers within the system, and prepare requirements and a development timetable for new procedures and computerized information systems.

Step 5: Test the design and estimate the economic results.

Some companies actually choose to skip step 5, because, as Mr. Wagner puts it, they are persuaded by the force of their own logic in the development of the system that it must be an improvement worth making. His attitude is more conservative and he recommends that the design be pretested prior to implementation to determine design deficiencies.

It is here that Wagner proposes that the analyst should use a powerful operations-research technique, namely, computer simulation. He states that simulation is actually about the only tool available for evaluating the full impact of a total-system design. He warns the reader, however, that computer simulation can be a very expensive approach to testing a system design and this should be considered during diagnosis.

The author emphasizes that a *total-system* design is required. Trying to design each function by looking at it in isolation is not likely to result in an improvement over the present system. A criterion of good design is that the system will not come to a crashing halt if there is a minor malfunction in one of its parts and will give an early warning when serious trouble lies ahead.

Phase III: Implementation

The third and final phase of the entire study is the implementation stage of the recommended new system. Wagner proposes three important elements in this phase:

1. If possible, begin the implementation with a pilot test; that is, try new approaches with only part of the system so as to work out any unforeseen difficulties.
2. Adopt an information-reporting system that can monitor how well the new system is performing.
3. If necessary, implement key organizational changes to make the new system work well and be an improvement over the old system.

Looking Ahead

In closing, the author mentions four problems that he would like to see studied in order to advance today's state of the art.

1. It would be helpful to have some practical analytic models that could be used to diagnose how much improvement potential exists in an existing production- and inventory-planning system, before designing and testing an alternative system.
2. It would be valuable to have analytic approximations that could estimate the operating characteristics and economic results of a proposed system without having to resort to lengthy computer simulation.
3. It would be worthwhile to have some rules of thumb, developed from analytic studies, to guide the basic design of a production- and inventory-planning system. For example, we need

a better understanding of when a "push" system (inventory review is done centrally) operates better than a "pull" system (review is done at the depot or warehouse level) and how often to revise plans.

4. It would be insightful to examine approaches of behavioral scientists that could facilitate the implementation of new management planning and control systems.

Larry E. Hodges
Operations Research Analyst
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The Pyramidal Pirouette

A pyramidal pirouette, sometimes called an organization stomp, is a dance, although one sometimes wonders whether it is being carried out with the head or the feet. It is the process that organizations seem to want to put themselves through to prevent hurting the feelings of the unpromotable when they are not being promoted.

Duncan Campbell
in *Management Controls*
published by Peat, Marwick,
Mitchell & Co., July 1974

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