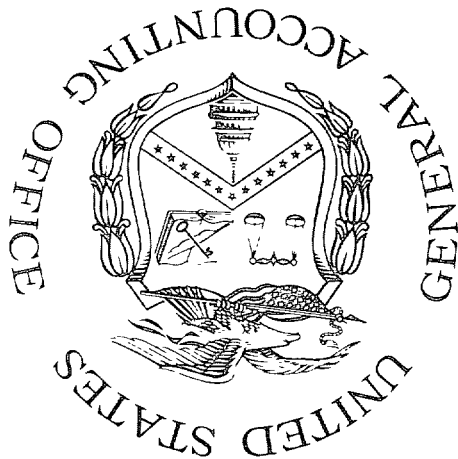


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# THE GAO REVIEW



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# THE GAO REVIEW

## FALL 1969

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Published quarterly for the professional staffs of the  
U.S. General Accounting Office



**Robert F. Keller**

## New Assistant Comptroller General

On August 29, 1969, President Nixon nominated *Robert F. Keller*, General Counsel of the General Accounting Office since 1958, to be Assistant Comptroller General of the United States for a term of 15 years.

The Senate Committee on Government Operations held a hearing on Mr. Keller's nomination on September 23. At the hearing, the Comptroller General, *Elmer B. Staats*, made the following statement in support of Mr. Keller's nomination:

In the past 3½ years as Comptroller General, I have become increasingly impressed with the great importance—indeed, the essentiality—of the role which the General Accounting Office plays not only for the Congress but for the entire Federal Government.

The President's decision to nominate an outstanding career official to the important post of Assistant Comptroller General of the United States is particularly appropriate at a time when renewed attention is being given to ways and means for strengthening the General Accounting Office. It also comes at a time when Government programs have vastly increased in complexity and size, giving added emphasis to the need for increased capabilities in the General Accounting Office to assure that Federal programs are carried out economically and effectively.

For more than 10 years Mr. Keller has served in the position of General Counsel of the Office in a manner which has earned him respect and distinction in both the executive and legislative branches of the Federal Government.

When confirmed by the Senate, Mr. Keller will fill the post held so ably by Mr. Frank Weitzel and, before him, Mr. Frank Yates. Both of these men were products of the fine professional career service for which the General Accounting Office is so well known.

In carrying out its mission, the Office strives to serve in a professional and objective manner the Congress as a whole. Mr. Keller in his role as General Counsel of the General Accounting Office has demonstrated that he can serve as Assistant Comptroller General in a most admirable way.

Mr. Keller was confirmed by the Senate on September 26 and sworn in as Assistant Comptroller General on October 3, 1969, at a ceremony held in the GAO Building.

As the fifth Assistant Comptroller General, Mr. Keller succeeds Frank H. Weitzel whose 15-year term expired January 17, 1969 (see *GAO Review*, Spring 1969).

On October 3, 1958, Mr. Keller was appointed by Comptroller General Joseph Campbell as General Counsel of the General Accounting Office, in which position he has served continuously since that date.

Mr. Keller began his service with GAO in 1935 in the former Reconciliation and Clearance Division. In 1937 he transferred to the Claims Division where he served until World War II when he entered the Navy in 1942 with a commission as ensign.

From 1942 to 1945 he served on active duty in the capacity of Assistant to the Officer-in-Charge of the Navy Purchasing Office, San Francisco, Calif., and later as General Counsel of that office.

Upon release from active duty in 1945 as lieutenant, Mr. Keller returned to GAO and was appointed to a legislative attorney position in the Office of

## NEW ASSISTANT COMPTROLLER GENERAL

the Comptroller General where he served with Frank H. Weitzel who was then Assistant to the Comptroller General. In 1950 Comptroller General Lindsay C. Warren designated Mr. Keller as an Assistant to the Comptroller General and in 1953 he was appointed as principal Assistant to the Comptroller General in charge of congressional liaison activities.

In 1953, Mr. Keller was designated to act as Comptroller General in the absence of the Comptroller General and Assistant Comptroller General. Under this delegation of authority Mr. Keller has on a number of occasions served as Acting Comptroller General.

Mr. Keller is a member of the bar of the District of Columbia and has been admitted to practice before the District Court of the United States for the District of Columbia and the U.S. Court of Appeals for the District of Columbia. He is a member of the American Bar Association and is a member of the Council of the Section on Public Contract Law. Mr. Keller is also presently serving as a member of the Board of Advisors of the National Contract Management Association and is an active member of the Federal Bar Association.

Mr. Keller was born in Washington, D.C., on August 22, 1913, and attended

public schools in New York, Minnesota, and the District. After attending George Washington University, he received an LL.B. degree in 1937 from the Washington College of Law (American University), and a B.C.S. degree (accounting) in 1952 from Benjamin Franklin University. In 1961 he completed the management course of the American Management Association.

In 1965 Mr. Keller was the recipient of a Rockefeller Public Service Award in the field of law, legislation, and regulation. The Rockefeller awards which are administered by Princeton University are given annually to men whose careers in the Federal Government have been marked by sustained excellence in service to the Nation. At the time Mr. Keller was given the award, he had completed 30 years of service in the General Accounting Office.

Mr. Keller has been active in community affairs and at one time served as president of the Loughborough Lions Club of Montgomery County. His hobby is sailing and he shares ownership in a boat on the Chesapeake Bay. Mrs. Keller is the former Mary Benton Robinson. The Kellers have two daughters, Mrs. Edward (Elizabeth) Koepe-nick and Katherine Keller, and two grandsons, Michael and Kevin.

# Federal Support for Research and Education: Costs and Benefits

721401

By Elmer B. Staats

*Comptroller General of the United States*

**The following paper is based on the address by the Comptroller General at the annual meeting of the Committee on Government Relations of the National Association of College and University Business Officers, San Francisco, Calif., July 11, 1969.**

The title of this paper has been chosen to emphasize the costs and benefits of Federal support to institutions of higher education—a term which has come into vogue in the past few years and a term which is designed to emphasize not only dollar or monetary costs, but also the social, economic, and administrative costs or implications of program decisions. I believe that phrase is appropriate as we discuss problems associated with Federal support to colleges and universities for research and education.

At present, between 3 and 4 percent of our national budget, based on rounded figures, is allotted to universities or colleges. This amounts to about \$5 billion of a total budget outlay of about \$150 billion (exclusive of our military costs in Southeast Asia) and more than a third of total outlays for higher education. The management of these funds therefore becomes a matter of obvious public interest. In societies of the Free World there are historical and constitutional mandates that public funds be expended economically and efficiently, that the results be effective, and that expenditures be publicly accounted for.

We in the Government and you in the universities and colleges do have a political accountability in being able to affirm to any interested party, be it a citizens group or a congressional committee, that public funds are wisely awarded and prudently expended. Herein lie problems for both the colleges and universities and the Federal Government.

If there is one theme that must consistently repeat itself in our minds day after day it must be that knowledge not only costs money but that every year it costs more money. At the same time the demand for knowledge is always on the increase. This is the treadmill that has brought Federal funds on an increasing scale, in a growing variety of ways, into our educational institutions. And with that rise in Federal participation in the budgets of our colleges and universities has come increasing congressional attention to and interest in how the funds are spent.

This trend will continue and probably will rise because knowledge is indispensable to a modern society such as ours. With the exception of our fundamental moral ideals, religious princi-

ples, and constitutional foundations—without which mere knowledge could be applied in any direction—knowledge is probably the greatest resource we have. We must have it; it costs money; and so the question continually before us all is simply: How do we get the most knowledge from the money we have available?

This is fundamentally the issue behind the present concern in the Congress as to how costs involved in performing Government contracts for research and development by the colleges and universities can best be apportioned.

### ***The Fruits of Basic Research***

The work that the universities and colleges have done for a number of years in the area of research and development, in both basic and applied research, has produced pearls without price. An article in *Science* magazine of some months ago by Dr. Charles H. Townes, Nobel Laureate, provides as convincing an example of what is being done by your institutions as any I know of.

Ten years ago few areas of physics seemed as unpromising from the practical viewpoint as investigations of the interactions between microwaves and gas molecules. Dr. Townes pointed out that, since practical applications could not be clearly foreseen to enter on the balance side of the ledger against the expenditures for research in this area, private industrial laboratories left this area primarily to university researchers. You all know the amazing result. The basic research in some of your institutions produced the laser and

the maser which today are revolutionizing many branches of technology and creating an entirely new and fast-growing industry.

This illustrates the difficulty in trying to test proposed expenditures for research on a balance sheet before work is undertaken. If potential benefits of a given project had to be foreseen with certainty, accomplishments would be greatly restricted. Both vision and dollars are required for research, as in running a higher institution of learning generally. But because one out of every five dollars that you spend for one program or another comes from the Federal Government, controls to greater or lesser extents are provided by the Congress in the laws passed to administer the programs it supports.

Dr. Lee A. DuBridge, the science adviser to the President, has observed that these controls can be contracted or altered in whichever ways the public, through the Congress, may demand. This is another way of defining "the politics of knowledge." Dr. DuBridge went on to say:

"It is not difficult to set forth in a general way the goals we all seek to achieve in the use of scientific knowledge. In the negative sense, we all wish to prevent or discourage applications of science which are harmful to individuals or to groups of individuals \* \* \*. On the positive side we wish to encourage and support those applications of science which \* \* \* will improve the quality of life in our cities and in rural areas, which will reduce the dangers of wars between nations."

"All this is easy to say—and very hard to accomplish," Dr. DuBridge con-



tinued. "For example, we all wish to reduce air pollution. One way to do this (in part) would be to prohibit the use of any vehicle which burns gasoline—or to prohibit the sale of gasoline itself \* \* \*. We might also prohibit the operation of any industrial facility which discharges contaminating products into the atmosphere. But such sledgehammer methods are clearly undesirable and unworkable. A better way is to encourage research aimed at the development of better technology for reducing such pollution. And then when better technology is available, to encourage or require its utilization. This is indeed being done—though the pace of advance may seem slow." This is the end of the quotation. But I would add, in view of costs and benefits, that public regulation is sometimes the greatest incentive to development of new technology.

More funds appear to be needed for the support of research in pollution technology and for environmental technology in general. The present Administration is seeking new mechanisms to improve and expand Federal-State activities in this direction—and new mechanisms for the control and prevention of pollution, such as those used in the recent Santa Barbara oil disaster. New knowledge and new technologies are needed, as well as better regulation and management, using existing technologies. Positive measures to enhance our opportunities to capitalize on our knowledge and on our talents can pay great dividends. An important role of government is to remove barriers and to speed progress in many fruitful areas. These are

areas where the General Accounting Office is now becoming very active.

The great American universities can assist in this endeavor. Dr. DuBridgely spoke for many of us in expressing his hope that the universities can invent innovative ways for organizing interdisciplinary programs for bringing our knowledge and our talents in science and social science to bear on the problems of our society.

### ***Study of Indirect Cost of Research***

As most of you are probably well aware, the General Accounting Office recently completed a study of the indirect cost of research sponsored by the Federal Government at educational and other nonprofit institutions, primarily research performed by colleges and universities.

For fiscal years 1966 through 1968, the appropriation acts of the various Government agencies awarding grants for the conduct of research contained a provision requiring cost sharing by recipients. These acts instructed the Federal agencies that none of the funds provided should be used to pay any recipient of a grant for the conduct of a research project "an amount equal to" the entire cost of the project.

For fiscal year 1969 an amendment was proposed by Senator Mike Mansfield to the Department of Defense Appropriation Act. This amendment would have reinstated a practice which had been in effect in the years preceding adoption of the legislative requirement for cost sharing. This was the practice of fixing a percentage limitation on the amount of overhead

which a Federal agency could reimburse the holder of a research award.

The Mansfield amendment proposed that no part of the funds provided should be used to pay any recipient of a grant or contract for the conduct of a research project an amount for indirect expenses "in excess of 25 per centum of the direct costs."

The Senate passed the amendment after making its provisions applicable only to the Department of Defense rather than to all appropriation acts. The bill approved by the House of Representatives retained the language of acts of previous years.

A conference committee appointed to resolve differences in the bills apparently couldn't agree on either provision and directed that the language of both the House (cost sharing) and the Senate (25-percent limitation on indirect costs) be stricken from the bill.

The conference committee stated that new and comprehensive studies should be made of the entire area by the General Accounting Office, by appropriate legislative committees, and by the Appropriations Committees. The studies should be directed toward achieving a uniform formula for the ascertaining of indirect costs on research grants throughout the entire Government. The Government should set the basis for indirect costs based upon sound accounting principles.

The intent of the conference committee was transmitted to the General Accounting Office on October 11, 1968, by letter from Representative George H. Mahon, chairman of the House Committee on Appropriations.

### *Concerns of the Congress*

It might be helpful to review some of the problems giving rise to concern by the Congress. Although these problems would not appear to be directly solvable by imposition of a fixed limitation on overhead, they reflect the mood of many Members of the Congress that there is a need to control in some way the costs of research financed by the Government.

The concerns which have been expressed by Members of the Congress include three areas:

*Need for a more equitable distribution of research funds.* As you know, programs for research centers, or "centers of excellence" as they are now known, have been developed through Federal support during the past two decades at universities and institutions on the east and west coasts. Institutions in the central portion of the country have not been furnished comparable support.

*Overlapping responsibility for research.* Although the National Science Foundation is charged with support of centers of excellence, the Department of Defense also funds programs with similar objectives. In addition, DOD conducts basic research in some fields which NSF supports and in medical sciences which the National Institutes of Health supports. Furthermore, DOD is involved in behavioral and social science research and the Defense-related need for some of the research has been questioned.

*Results of research.* The opinion has been expressed that it is diffi-

cult for the Congress to ascertain the results coming out of the constantly increasing Federal contribution to the support of basic research and development programs. There is a feeling that greater attention is needed as to the extent of Federal participation and the degree to which universities should be expected to share in the costs of research.

### ***Approach Taken by GAO***

In planning and carrying out our assignment in the short time allotted, representatives of the National Association of College and University Business Officers and the American Council on Education were of invaluable assistance to us.

On November 18, 1968, representatives of GAO met with representatives of the National Association of College and University Business Officers and the American Council on Education. This meeting was the springboard for continuous cooperation between our organizations through the course of our study up to the issuance of our report to the Congress.

The National Association of College and University Business Officers made available to us the results of a study conducted the previous year by its Committee on Governmental Relations of on-campus overhead rates of 64 public and private institutions. Permission was obtained from certain of the schools to identify rates with particular institutions so that we might use this information in selecting a representative sampling of private and public schools with high and low rates for our study.

The American Council on Education supplied us with voluminous literature on indirect cost limitations and cost sharing on research grants.

These and related contributions enabled us to complete the study within the limited time available.

### ***Scope and Findings of GAO Study***

The Mansfield amendment would have placed an overhead limitation on both grants and contracts for research projects. The conference committee, however, directed that studies be made toward "achieving a uniform formula for the ascertaining of indirect costs on *research grants* throughout the entire Government." The request, received by the General Accounting Office from Congressman Mahon, also was limited to *research grants*.

Federal agencies having authority to contract have also been authorized, since 1958, to make grants for the support of research. But this authority has been limited to grants with institutions of higher education or nonprofit organizations primarily engaged in scientific research. Accordingly, we conducted our study at 13 educational institutions, two hospitals, and two nonprofit research institutions. Since most of the basic research performed outside of Government laboratories was conducted by universities in fiscal year 1968, we concentrated on the educational institutions. The number of institutions included was limited by the time available.

Because some agencies use the contract instrument for the same type of

research as other agencies obtain through use of the grant instrument, we reviewed research contracts with educational and nonprofit institutions. We did not include development contracts. We met with officials of the six Government departments and agencies that spend the predominant share of Federal research funds. We also obtained data on indirect cost negotiations with 190 institutions from agency files.

At the 13 colleges and universities, we obtained information on the number and amount of Government research grants and contracts held by the institutions, the indirect cost rates each proposed, the bases used to allocate costs to Government research, the audit and negotiation records supporting determination of a final overhead rate, and the extent of participation by the institutions in sharing costs of Government research.

We solicited the views of institution officials regarding the impact on research of cost restraints, such as the imposition of a fixed limitation on overhead reimbursement or of a mandatory cost-sharing requirement.

As you now know, we concluded from our study that a uniform formula, in the sense of a uniform percentage rate to be applied to direct cost—or some element thereof—would not result in a realistic determination of indirect cost. We concluded also that it is not feasible to determine indirect cost by a fixed method or procedure applied uniformly under all conditions. Overhead costs are merely a measure of the indirect portion of the total cost of research, and there are a number of valid reasons why indirect cost rates vary. Here are

examples of the variety of costs given in our report:

- At 12 of the 13 universities, computer-operating costs were directly identified to research projects. At one university total computer costs were charged to overhead.
- Some universities charged faculty members' time to administration instruction and research. Such universities therefore charged those portions of faculty members' salaries for research and instruction as direct costs and those portions identified to administration as indirect cost. Other universities distributed faculty members' time solely to research and instruction, although administrative work may have been involved.
- When research was conducted solely in buildings constructed by the universities, building-use charges, or depreciation costs, were made. Where research was conducted in rented space, rental cost was charged as a direct cost.
- In buildings constructed with Government funds or leased to universities by the Government at a dollar a year (such as converted airports or military buildings) no charges were made for building use or maintenance.
- Similar variances were noted with respect to equipment used in research.
- Depending on the proximity of research facilities to the main campus, many overhead costs incurred on the main campus—therefore charged to main-campus research—were not charged to

off-campus work because off-campus research activities did not benefit from these costs. Examples of such costs are library costs, student service costs, certain operations and maintenance costs, and departmental administration costs.

—The geographical location also may be a factor affecting the indirect cost rates; some universities may be located in high-cost areas and others may be located in low-cost areas. Costs of utilities and labor could differ among the various regions of the country. Differences in climatic conditions result in differing consumption rates for heating and air conditioning and in the need for maintenance costs such as snow shoveling and sanding.

—Some universities have all their buildings in a relatively compact area and others are located in a relatively spatial setting. The former have smaller areas of sidewalks and streets to be maintained while the latter may incur more costs in landscaping and ground maintenance.

—At one university we found that salaries for shop foremen, chauffeurs, buyers, programmers, and secretaries whose activities were research related were charged as direct costs. Where research is undertaken in separate laboratories, in separate buildings, or in facilities located away from the main campus, the tendency is to charge more costs as direct costs because they can be more readily

identified to specific research work.

There are differences also in the missions of the institutions, the nature of their research projects, their methods of operation, and the manner in which they are organized to perform research. Accordingly, the amount of indirect cost incurred will vary considerably, and properly so.

Fringe benefits, plant repairs, building alterations, and maintenance are handled as direct costs by some universities, as indirect costs by others.

### *Conclusions of GAO Study*

From these several examples you can readily see why we concluded that there is not enough standardization among research institutions and projects to permit the use of a uniform formula or a fixed method of determining indirect cost.

We did conclude, however, that uniform principles and guidelines can be useful for determining indirect cost, provided they have sufficient flexibility to enable proper application to differing circumstances in an equitable manner.

As a result of our study, we believe that consideration should be given to providing more specific guidance and greater uniformity in the implementation of those principles and guidelines already laid down by the Bureau of the Budget Circular No. A-21. Although we do not believe that additional guidance or improved administration will eliminate variations in the levels and rates of indirect costs, we do believe that they should serve to lessen the differences.

Both Government agencies and educational institutions are opposed to mandatory cost sharing. Both recognize that in some circumstances voluntary cost sharing is appropriate. Both believe that the amount of cost sharing is greater than that which has been identified.

We in GAO concur in the concept adopted in 1966 that cost sharing, to the extent that sharing is required, should be related to the total cost of a project. We believe that the interests of the Government and the institutions involved make it highly desirable that, within the requirements established by the Congress or the executive branch, the amount of cost sharing be flexible—a matter for negotiation between the responsible Government agency and the grantee institution.

### *Harris Subcommittee Hearings*

In March 1969, a draft of the GAO study was given to the interested committees of the Congress. This was followed by hearings scheduled before the Subcommittee on Government Research of the Senate Committee on Government Operations, commencing April 22, 1969.

At this hearing we opposed the imposition of a uniform formula for determining indirect cost; we noted that there are divergent views on the advisability of continuing the cost-sharing requirements; and we pointed out that these differing views cause recurring problems.

We argued that, if a consistent policy is to be followed by the executive agencies, guidance will be needed from either the Congress or the executive

branch as to whether cost sharing is to be required and, if so, the level, the kinds of research programs in which it will be expected, and the degree of latitude to be permitted in its administration.

We suggested that the Harris subcommittee go deeply enough into these matters with the Government agencies concerned, and with the representatives of educational institutions, to enable it to formulate policy guidance and to obtain approval by the Congress or the committees concerned.

As an alternative, if mandatory cost sharing were to be required, congressional control over cost sharing would be effectively provided with minimum administrative cost and burden through review by congressional committees in their legislative and appropriation hearings of the cost-sharing policies followed by the various individual agencies. On the basis of such review, the agency could be required to make any desired revisions in its cost-sharing policies.

GAO transmitted its final report to the Congress on June 12, 1969.<sup>1</sup>

One of the first 1970 appropriation bills to be acted upon by the House provided funds for the independent offices, including the National Aeronautics and Space Administration, the National Science Foundation, and the Department of Housing and Urban Development. This bill, passed June 24, 1969, contains a provision that none of the funds provided be used to pay any recipient of a grant for a research project an amount equal to the entire

<sup>1</sup> "Study of Indirect Cost of Federally Sponsored Research Primarily by Educational Institutions" (B-117219).

cost of the project. Thus, the initial congressional action has been to retain a requirement for cost sharing.

Last year's effort to fix an overhead limitation on research grants took place in the Senate; it was applicable to the DOD appropriation. It remains to be seen whether a similar attempt will be made this year.

### ***Should Cost Sharing Be Mandatory?***

Apart from advocating the use of cost sharing as a device to reduce the cost of Government research support, consideration of the merits of mandatory cost sharing must evaluate the philosophy of the entire university-Government relationship in research. There is no doubt that the Government needs the universities' research and the university research organizations need the Government's support. Nor is there any question that both have benefited from their association. But there is a strong difference of opinion as to whether this mutuality of benefit should be translated to mean that the educational institutions should share the costs of Government research.

Proponents of cost sharing cite, in addition to the aid the colleges and universities receive in carrying out their research function, the fringe benefits received by the institutions from federally financed research. These benefits accrue in the form of increased prestige and reputations, retained equipment purchased with Government funds, and salaries partially borne by the Government. It is also claimed that cost sharing enables a wider distribution of limited

Federal research funds among competent investigators and universities.

Opponents of mandatory cost sharing claim that the commitment of funds to support Federal research necessarily reduces the amount of funds available to support overall institutional programs. It is contended that, in some cases, funds are diverted to support scientific research at the expense of research in other academic fields.

The American Council on Education contends that, except in special circumstances, cost sharing and matching requirements should be eliminated, inasmuch as the principal contribution made by an institution to federally sponsored research should be its expertise. This recommendation was contained in a paper submitted in connection with our study.

The argument has been advanced also that the matter of research support should be considered as merely one element of the Government's overall involvement in the support of education, that cost sharing on research seems unwarranted in light of the aims of the many other support programs to help educational institutions financially.

Until such time as we have further clarification of policy, we must live with the fact that the Congress for the past 3 years has required institutions to share in the costs of Government research.

In our study we noted that, if there is to be a consistent application of cost sharing (and application is to depend upon whether a grant or a contract is used), there will be a need for well-defined and uniform Government-wide standards governing the use of con-

tracts or grants for research. Agencies using the contract instrument for research have not been subject to the mandatory cost-sharing requirements, although cost sharing was obtained in many instances by these agencies.

The Bureau of the Budget recently completed an interagency study of the policies, procedures, terms, and conditions used for research projects at educational institutions. The BOB-led study group examined into the grant versus contract problem and the advisability of using a new instrument, possibly to be called a research agreement.

We believe that there is a need for guidelines on when to use a grant and when to use a contract, as long as the Congress sets a cost-sharing requirement applicable to grants but not to contracts.

### ***Uniform Contract Cost Principles***

I understand that there is interest in this group in the GAO study of the feasibility of establishing uniform contract cost principles and particularly its relationship to institutions of higher education. The law under which this study is being made did not exclude colleges and universities or other non-profit organizations. We were directed to consider the feasibility of establishing uniform cost principles for use in all Government procurement contracts in excess of \$100,000.

We do not know at the present time what our conclusions will be—our report is not due until December of this year—but it does appear that flexibility will be necessary to meet differing circumstances. We hope that much can be

accomplished in reducing the wide variety of treatment now accorded similar transactions under existing contract cost principles and generally accepted accounting principles. Extensive data now being accumulated under this study have not been fully evaluated.

It seems apparent that the maximum degree of uniformity and consistency of treatment compatible with equity under the varying circumstances would be a highly desirable objective. I do believe, however, that there are basic differences in the relationships—in contracting with universities compared with contracting with commercial enterprises—which need to be recognized.

For one thing, universities normally do not receive a fee or profit on the work they do for the Government, whereas commercial enterprises ordinarily do receive such a fee or profit. This fee or profit allowance permits differences in the cost principles which may be used. For instance, interest represents a cost of providing capital. Likewise, dividends must be paid for the use of capital. Since dividends obviously should not be allowed as a cost of contract performance, the usual practice is not to allow interest as an allowable cost. The fee or profit allowed a commercial concern can take this into consideration. However, there is no fee or profit provided in contracts with universities and this avenue is not available to compensate for the disallowance of interest which is generally recognized as a legitimate cost.

The allowability of interest under contracts and grants with educational institutions merits further thought. There appear to be some cases in which



the schools invest funds specifically for Government research and incur interest cost or lose endowment fund income, yet they cannot recover this cost or loss of income under the existing cost principles.

Some consideration of this inequity will be necessary. Perhaps it is a matter for negotiation in individual cases rather than general adoption of allowability of interest. There would certainly be problems with allowing interest generally on all the capital investment involved. Much of this capital has come from rather nonconventional sources in the sense that much of it has been donated. The relationship is unique also in the sense that there is an element of mutuality of benefit in these programs. The resulting concept of cost sharing is further evidence that a different attitude toward cost determination may be necessary.

### **Conclusions**

How do we get the most knowledge from the money we have available for Government-sponsored research in the universities and colleges? This is the reason questions are being asked in the Congress—questions, as we have seen, which are sometimes difficult to answer adequately. How do we get more return on each dollar of investment in research? The more astutely you can answer that question the less you will have the Congress inquiring into your activities. In a very real sense, this is “the politics of knowledge.”

In other words, it is good politics to be good managers.

As Comptroller General, I am concerned with the effective utilization of Federal funds whether expended directly by the Federal agencies, through grants to State and local governments, through contracts to business organizations, or through grants to nonprofit organizations. As managers, university presidents, deans, and business managers must be concerned not only with the practical problems which we have discussed, they must also be concerned with whether public funds have been translated into meaningful research results and whether the university as a whole—not just a single researcher or a single department—recognizes the responsibility for effective management of research.

In his current book, “The Age of Discontinuity,” the economist and management consultant, Peter F. Drucker, makes this same point. The book is appropriately subtitled “Guidelines to Our Changing Society” and I will close by quoting from it as follows:

We need something that higher education has never known it needs: we need managers. The several different kinds of people in the faculties have to be organized into one institution. Yet they have to be organized for a variety of functions. Each of these men will have to be able to achieve his own purposes and to obtain his own satisfaction from his work.

This requires high managerial ability. The university may well offer the most challenging, the most difficult, but also the most needed of all managerial tasks around today.

721402

## Discounted Net Cash Flow—Measure of Economic Worth and Aid to Decisionmaking

By L. Marvin Barton

**This article provides a review of the discounted net cash-flow method of estimating economic worth. The author recently participated in an assignment where the discounted net cash-flow method served as the primary technique for developing projections of the possible economic consequences of sale versus Government retention of the Atomic Energy Commission uranium enrichment plants at Oak Ridge, Tenn., near Paducah, Ky., and near Portsmouth, Ohio.**

The discounted net cash-flow method of estimating economic worth is suitable for use wherever economic alternatives are available, but one or more must be rejected.

Net cash flows in decisionmaking may involve anything from a small machine to a giant enterprise. Whatever the situation, estimates of the economic worths of available alternatives may be developed by determining the total present worths of the expected net cash flows. This tends to ensure objective consideration of economic factors. It does not eliminate uncertainty or the need for judgment. Uncertainty cannot be eliminated through quantitative analysis, and judgment cannot be replaced by valuation techniques. However, the discounted net cash-flow method can assist in assessing risk and

can furnish an important complement to judgment in decisionmaking. Without such a method of analysis and appraisal, decisionmaking is left to chance with no systematic approach toward the best choice.

### *Discounted Net Cash Flow*

The discounted net cash-flow method of valuation is a means of estimating the present economic worth of an enterprise, activity, or asset by use of data, conditions, and assumptions about the future. Generally this present worth is the measure of the earning power available through combinations of economic resources such as physical plant and management.

Determinations of present worths are dependent on the time value con-

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cept or the principle that a dollar available today has more economic worth than one which cannot be received until later. Placing a time value on money makes it possible, by means of the discounting technique, to view from the same point in time cash flows that occur at various points in time. Thus, even though cash flows occur at various points in time, use of the discounting technique and calculation of present values make it possible to compare and accept or reject alternatives that differ in the time-phasing of their costs and benefits. Present value is a common denominator that makes such decisions possible.

The discounted net cash-flow method's basic purpose of furnishing a foundation for choice between economic alternatives can be carried out under varying circumstances. Decisions about buying in, selling out, expanding, diversifying, substituting, or altering plant and equipment; decisions on changing methods of operation; and, in some instances, even decisions on changes in management and personnel can be aided by discounted net cash-flow valuations. In short, wherever allocations of quantifiable economic resources are to be made, cash-flow analyses can assist in choosing from alternatives and in arranging the timing of occurrences of financial transactions. Further, these analyses can furnish a basis for assigning priorities or rankings to available alternatives for capital commitments. These rankings can be especially useful where sufficient capital is available to select several from an array of available alternatives.

The table on page 18 illustrates the appropriate ranking of three alternatives which, in the absence of recognition of the time value of money, would seem equally attractive. It also shows why the discounted net cash-flow method of valuation is generally superior to any of the methods which do not give due weight to the time value of money.

Even though the discounted net cash-flow method of valuation is generally superior to methods which do not account for time value, it requires careful planning and good analyses. Each analyst or manager must remember that the validity of results depends on the reliability of the underlying data, conditions, and assumptions about the futures of available alternatives. Care must be exercised to ensure that all appropriate alternatives are given consideration and that the data, conditions, and assumptions attendant to each alternative are realistic in light of the projected operations and management of the alternatives. Decisions based on analyses or valuations which in turn are based on unreliable information may result in unnecessary risk and poor allocations of economic resources.

### *Estimating Economic Worth*

To estimate the total present worth of each alternative, first the future net cash flows must be derived by projecting the total cash inflows and the total cash outflows according to the times when they are expected to occur. This recognition of cash flows as transactions of specific future periods may be accomplished by breaking down, into

DISCOUNTED NET CASH FLOW METHOD

Ranking of Alternatives

*Time Value of Money Not Taken Into Account*

Alternative	Cash inflow or outflow				Ranking
	Years			Total	
	1	2	3		
A.....	\$5,000	\$5,000	\$5,000	\$15,000	
	-4,500	-4,000	-4,200	-12,700	
	500	1,000	800	2,300	Equal.
B.....	5,000	5,000	5,000	15,000	
	-4,000	-4,200	-4,500	-12,700	
	1,000	800	500	2,300	Equal.
C.....	5,000	4,500	5,500	15,000	
	-4,500	-4,000	-4,200	-12,700	
	500	500	1,300	2,300	Equal.

*Discounted Net Cash Flow and Ranking Based on Time Value at a 15-Percent Discount Rate*

Alternative	Discounted net cash flow				Ranking
	Years			Total	
	1	2	3		
A.....	\$435	\$756	\$526	\$1,717	2
B.....	870	605	329	1,804	1
C.....	435	378	855	1,668	3

intervals of 1 year each, the total time over which cash flows are to occur. Thus, an enterprise, activity, or asset with an anticipated productive life of 10 years would have 10 intervals or time-value periods. Cash flows then may be identified to these time-value periods by assuming that all cash flows within each year occur at the end of the year. This technique known as the year-end convention may be used successfully in most circumstances. Other conventions may be used if the particular

circumstances of valuation problems indicate that they would be more appropriate.

After the total net cash flows have been identified for each time-value interval, they may be reduced to their present worths by applying a stated discount rate. The sum of these discounted net cash flows is the estimated present economic worth of the alternative.

Repeating the above procedures for each economic alternative under con-

sideration will provide the estimated present worth of each alternative and furnish the foundation for decision as to which alternatives to accept or reject.

The following discussion of discounting and valuation will further clarify the concept of time value and time-value intervals. Also, it will show how time value contributes to estimates of economic worth.

### Discounting

Discounting is the reduction of future cash flows to their present worths by applying factors developed from a stated rate of interest. This conversion of future years' cash flows to present worths is done by determining the amount of principal which, when increased by earnings through compound interest, will equal the stated future cash flow. This is demonstrated in the illustrative problem below.<sup>1</sup>

*Problem:* Using a 15-percent rate of discount, determine the 1970 present worth of a dollar to be received in 1971 and the 1970 present worth of a dollar to be received in 1972.

*Formula for solution:* The formula for determining the present worth of a future cash flow may be stated as:

$$PW = \frac{F}{(1+i)^n}$$

where: PW = present worth  
 F = cash flow  
 i = interest rate  
 n = number of years before  
 the cash flow occurs

<sup>1</sup> For further discussion of discounting and the net cash-flow method of valuation, refer to Grant & Ireson, *Principles of Engineering Economy* (4th ed.; The Ronald Press Co., 1964; New York City), ch. 7.

*Solution:* The 1970 present worth of the 1971 dollar is \$0.8696:

$$PW = \frac{\$1.00}{(1+.15)^1} = \$0.8696$$

The 1970 present worth of the 1972 dollar is \$0.7561:

$$PW = \frac{\$1.00}{(1+.15)^2}$$

$$\frac{\$1.00}{1.3225} = \$0.7561$$

Extension of the above problem to include receipt of one dollar each year through 1980 would show 10 different dollars, each with a different 1970 present worth. These 10 different present worths are shown graphically on page 20.

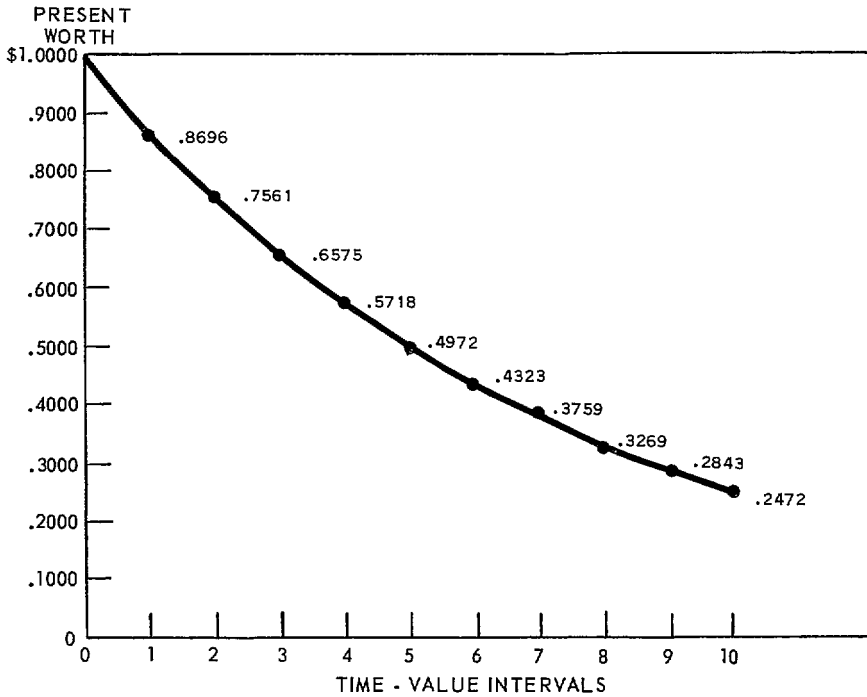
The problem and solution just presented show discounting of one dollar at a time. They also illustrate the procedure for computing present-worth factors which can be used to determine the present worths of any amounts of future cash flows. Although present-worth factors were computed for illustration, such computation is not necessary every time a need for valuations arises. The factors are available in published tables.

### Valuation

Valuation is the process of developing an estimate or appraisal of worth. It includes the whole realm of accumulating, classifying, and analyzing information which is needed to furnish a realistic assessment of conditions which may increase, decrease, or shift future cash flows.

Because cash flows are the essence of economic worth, their development

## DISCOUNTED NET CASH FLOW METHOD



requires close attention to projections of operating revenues and expenditures, potential cash inflows and outflows from activities other than primary operations, income tax benefits and obligations, available types of capital, and the required minimum rate of return.

After projected cash flows have been developed, present-worth factors, such as those presented in the discussion of discounting, can be used to complete the valuation process. This can be done in the following manner:

Using a 15-percent rate of discount for example:

1. Multiply all net cash flows occurring immediately at the outset of operations by a factor of 1.0000. This would apply to an initial investment or purchase price.
2. Multiply all net cash flows occurring after the initial investment but before the beginning of the second year's operations by 0.8696.
3. Multiply all net cash flows occurring from the beginning of the second year's operations but before the beginning of the third year's operations by 0.7561.
4. Continue to apply a successively lower present-worth factor to the net cash flows of each of the years remaining in the economic life of the alternative under consideration.
5. Complete the estimate of plant worth by summing the net cash flows developed in steps 1 through 4 above.

### ***Illustration of Valuation By Discounted Net Cash Flows***

The following discussion and illustration show how the economic worth of an industrial plant may be estimated by the discounted net cash-flow method. The illustration is based on one of the valuations developed in the assignment mentioned at the outset of this article. The mathematical model used for that assignment was one being used by the Operational Planning and Power Division, Oak Ridge Operations, AEC. However, for this article, I have refined the model into a combined cash flow-net income presentation and changed the figures to eliminate identity with actual levels of AEC activities.

As may be seen by referring to the illustration (p. 25) the basic unknown—plant worth—has been designated X. To provide a convenient basis for computation, each of several other items has been designated as a certain decimal fraction of X. These items are depreciation, insurance and taxes other than Federal income taxes, debt and debt repayment, and interest on debt. The designation of these items as fractions of X was made because the basic unknown on which they depend for their dollar amounts is the present worth of the plant. Although the dollar amounts for these items will remain unknown until the plant worth has been determined, carrying the items as fractions of X (functions of X) does not hinder but actually facilitates the computation of the estimated plant worth. This is explained below.

In the mathematical model and basic illustration on page 25, two sets of data and computations are carried through

simultaneously. Dollar amounts which are known are carried through, and the necessary computations are made to develop subtotals and totals for net cash flows. At the same time several types of cash flows which must be carried as unknowns and functions of plant worth are handled in the same manner except that the data, subtotals, and totals are expressed as functions of X.

The final totals of discounted net cash flows in knowns (in thousands) and functions of X then are set up in an algebraic equation, as shown below, to conveniently develop the estimate of plant worth. The equation shows that the aggregate discounted net cash flows in known dollars plus or minus the aggregate discounted net cash flows developed in functions of X is equal to zero:  $\$1,622 - 0.5700X = 0$ . This equation shows also that the total of all discounted cash inflows reduced by the total of all discounted cash outflows, including those for all taxes and initial purchase price, will be zero. Solving for X by division of the aggregate discounted net cash flows in known dollars by the aggregate discounted net cash flows in functions of X (as further illustrated on p. 25) yields the estimate of plant worth:  $\$1,622 \div 0.5700X = \$2,846 = X$ .

The discounting automatically gives consideration to the stipulated required minimum rate of return (profitability factor) in computation of plant worth. This is the reason discounted net cash inflows are not required to exceed but must be exactly equal to the discounted net cash outflows when the appropriate valuation has been derived. The \$2,846 above, developed from the data in the

## DISCOUNTED NET CASH FLOW METHOD

basic illustration on page 25, is the amount which may be paid for the plant with the expectation that operation of the plant for 10 years will provide for payment of all costs of operations, including all taxes, repayment of the debt (50 percent of the initial purchase price), 15 percent compounded annually on the unrecovered equity investment, and ultimate recovery of all the investment made by equity.

The minimum rate of return used in this article is a minimum rate of return on equity capital. Therefore no attempt was made to show an overall rate of return related to both debt and equity.

Further, the presumption is made that, each time part of the equity investment is recovered, an opportunity is provided for a new decision on capital commitment. For this reason, the actual return to equity, including interest compounded annually, is not the entire \$1,423 initial equity investment plus interest on the \$1,423 compounded annually for 10 years but is the \$1,423 initial equity investment plus interest compounded annually on the unrecovered part of the equity investment as of the beginning of each of the 10 years. The following table demonstrates this and shows the validity of the amount computed as equity's contribution to the initial purchase price of the plant. The figures, in the table, showing the present worth amounts in dollars and functions of X for the amounts of equity investment recovered, are from the basic illustration and computation of plant worth (see p. 25), and the \$1,423 initial equity investment is one-half of the total plant price. The other figures

were computed specifically for use in the table.

The table on page 23 shows a total of \$2,951 in net cash flows required for equity. Referring to the basic illustration of the estimate of the plant worth (see p. 25), the undiscounted net cash flows to (and from) equity are shown as \$3,400 offset by (.6578X). Of the (.6578X), (.5000X) is the outflow from equity as its contribution to the initial purchase price. Substitution of dollars for the remaining (.1578X) based on a plant price of \$2,846 yields \$(449). Subtracting this \$(449) from the \$3,400 shows a result of \$2,951 which is in agreement with the corresponding amount computed in the table showing net cash flows required. These figures in agreement furnish a check on the validity of the estimate of plant worth.

The \$2,846 valuation above was developed on the basis of the following assumptions and conditions which are an integral part of the basic illustration.

1. Purchase of an existing plant; no significant capital improvements after purchase.
2. 10-year economic life.
3. No operating losses.
4. No appreciable salvage value.
5. Declining balance depreciation optimized by appropriate switch to straight-line depreciation.
6. 48-percent Federal income tax rate.
7. 50/50 debt/equity at the point of initial purchase.
8. Debt repayment in equal annual installments.
9. 6-percent interest on debt.
10. 15-percent return on unrecovered equity.



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**Net Cash Flows to Equity Required To Earn 15 Percent, Compounded Annually, on the Amount of Equity Investment Unrecovered as of the Beginning of Each Year's Operations and To Ultimately Recover the Entire Equity Investment**

Present worth of equity recovered		Unrecovered equity (P)		Number of earnings periods (n)	Interest at 15 percent (i) compounded annually $(P \times i) \times (1+i)^{n-1}$	Cash flows required
Year	Amounts	Year	Amount			
1.....	178=178 .0010X= 3 <hr/> 181	1	\$1, 423	1	\$214	.....
2.....	257=257 (.0060X)=(17) <hr/> 240	2	1, 242	2	214	.....
3.....	224=224 (.0103X)=(29) <hr/> 195	3	1, 002	3	199	.....
4.....	194=194 (.0125X)=(36) <hr/> 158	4	807	4	184	.....
5.....	169=169 (.0113X)=(32) <hr/> 137	5	649	5	170	.....
6.....	147=147 (.0092X)=(26) <hr/> 121	6	512	6	155	.....
7.....	128=128 (.0074X)=(21) <hr/> 107	7	391	7	136	.....
8.....	111=111 (.0059X)=(17) <hr/> 94	8	284	8	113	.....
9.....	97= 97 (.0047X)=(13) <hr/> 84	9	190	9	87	.....
10.....	117=117 (.0037X)=(11) <hr/> 106	10	106	10	56	.....
<b>Total.....</b>	<b>1, 423</b>		<b>000</b>		<b>1, 528</b>	<sup>1</sup> <b>\$2, 951</b>

<sup>1</sup> Recovery of initial investment plus interest on unrecovered amounts as shown.

11. Working capital requirements equal 10 percent of cash inflows from operations.
12. Noncash expenses are taken into account by determining their effect on cash flows for Federal income taxes but are not themselves considered cash flows.
13. Year-end convention.
14. Figures rounded to thousands.

In addition to the above, as will be seen by looking closely at the basic illustration, the amounts and functions of  $X$  shown as cash flows for Federal income taxes must be considered together to develop a net figure for each year's actual cash flow for Federal income taxes. The offsetting amounts are automatically taken into consideration in solving algebraically for plant worth. Thus, inability to determine the net cash flow for income taxes in dollars until after the estimate of plant worth has been established does not present a serious problem under most circumstances.

The basic illustration incorporating the above and showing the development of an estimate of plant worth is on the opposite page. Some discussion of operating loss situations which might be encountered under some valuation circumstances follows.

### ***Operating Losses in Valuation Situations***

Although no operating losses were shown in the basic illustration on page 25, such might be encouraged. Where such operating losses enter into the valuation they may be dealt with in the following manner.

1. Compute a tentative plant value using the procedure discussed for

- the basic illustration just presented.
2. Substitute dollars for functions of  $X$  at the points where net income and cash flow for Federal income taxes would be determined.
3. Determine which years show operating losses after the substitutions have been made.
4. Develop successive tentative valuations until the optimum valuation has been determined, taking into account any operating losses and time limits on their use to offset income of other years for tax purposes.

The above involves a method of successive approximations which generally can be used to develop valuations to within an acceptable range. Such valuations should be developed only to a degree of finiteness which will furnish an appropriate basis for decision.

### ***Concluding Note***

The use of discounted net cash-flow method of estimating economic worth is timely and is gaining prominence where economic factors play a major role in decisionmaking. As analysts and managers become more aware of the importance of the time-value concept, use of methods which discount future cash flows to present worths will become more common in both the public and the private sectors of our economy.

### ***References***

- Selected references are listed for those interested in further study.
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**BASIC ILLUSTRATION OF NET CASH FLOW AND PLANT WORTH**

CASH INFLOWS (OUTFLOWS) AND NET INCOME	YEARS OF OPERATIONS										TOTAL	
	0	1	2	3	4	5	6	7	8	9		10
CASH INFLOW FROM OPERATIONS:	\$ 0	\$ 1,350	\$ 1,350	\$ 1,350	\$ 1,350	\$ 1,350	\$ 1,350	\$ 1,350	\$ 1,350	\$ 1,350	\$ 1,350	\$ 13,500
CASH EXPENSES:												
REGULAR OPERATING	0	( 696)	( 696)	( 696)	( 696)	( 696)	( 696)	( 696)	( 696)	( 696)	( 696)	( 6960)
INTEREST (FUNCTIONS OF X)	0	(.0300X)	(.0270X)	(.0240X)	(.0210X)	(.0180X)	(.0150X)	(.0120X)	(.0090X)	(.0060X)	(.0030X)	(.1650X)
INSURANCE & TAXES OTHER THAN FEDERAL INCOME TAXES (FUNCTIONS OF X)	0	(.0100X)	(.0100X)	(.0100X)	(.0100X)	(.0100X)	(.0100X)	(.0100X)	(.0100X)	(.0100X)	(.0100X)	(.1000X)
TOTAL CASH EXPENSES:												
NONFUNCTIONS OF X	0	( 696)	( 696)	( 696)	( 696)	( 696)	( 696)	( 696)	( 696)	( 696)	( 696)	( 6960)
FUNCTIONS OF X	0	(.0400X)	(.0370X)	(.0340X)	(.0310X)	(.0280X)	(.0250X)	(.0220X)	(.0190X)	(.0160X)	(.0130X)	(.2650X)
CASH BASIS NET INCOME BEFORE FEDERAL INCOME TAXES:												
NONFUNCTIONS OF X	0	654	654	654	654	654	654	654	654	654	654	6540
FUNCTIONS OF X	0	(.0400X)	(.0370X)	(.0340X)	(.0310X)	(.0280X)	(.0250X)	(.0220X)	(.0190X)	(.0160X)	(.0130X)	(.2650X)
DEPRECIATION (NONCASH EXPENSE FUNCTIONS OF X)	0	(.1500X)	(.1275X)	(.1084X)	(.0921X)	(.0870X)	(.0870X)	(.0870X)	(.0870X)	(.0870X)	(.0870X)	(1.0000X)
ACCURAL BASIS NET INCOME BEFORE FEDERAL INCOME TAXES:												
NONFUNCTIONS OF X	0	654	654	654	654	654	654	654	654	654	654	6540
FUNCTIONS OF X	0	(.1900X)	(.1645X)	(.1424X)	(.1231X)	(.1150X)	(.1120X)	(.1090X)	(.1060X)	(.1030X)	(.1000X)	(1.2650X)
CASH OUTFLOW FOR FEDERAL INCOME TAXES:												
NONFUNCTIONS OF X	0	( 314)	( 314)	( 314)	( 314)	( 314)	( 314)	( 314)	( 314)	( 314)	( 314)	( 3140)
FUNCTIONS OF X	0	.0912X	.0790X	.0683X	.0591X	.0552X	.0538X	.0523X	.0509X	.0494X	.0480X	.6072X
TOTAL NET CASH FLOWS FROM OPERATIONS:												
NONFUNCTIONS OF X	0	340	340	340	340	340	340	340	340	340	340	3400
FUNCTIONS OF X	0	.0512X	.0420X	.0343X	.0281X	.0272X	.0288X	.0303X	.0319X	.0334X	.0350X	.3422X
CASH FLOWS FOR CAPITAL ACQUISITION, USE, AND REPAYMENT:												
PURCHASE OF PLANT (FUNCTION OF X)	(1.0000X)											(1.0000X)
BORROWING FOR PURCHASE	.5000X											.5000X
DEBT REPAYMENT	0	(.0500X)	(.0500X)	(.0500X)	(.0500X)	(.0500X)	(.0500X)	(.0500X)	(.0500X)	(.0500X)	(.0500X)	(.5000X)
WORKING CAPITAL	0	( 135)									135	0
TOTAL NET CASH FLOWS FOR CAPITAL ACQUISITION, USE, AND REPAYMENT:												
NONFUNCTIONS OF X	0	( 135)	0	0							135	0
FUNCTIONS OF X	(.5000X)	(.0500X)	(.0500X)	(.0500X)	(.0500X)	(.0500X)	(.0500X)	(.0500X)	(.0500X)	(.0500X)	(.0500X)	(1.0000X)
TOTAL NET CASH FLOWS TO (FROM) EQUITY:												
NONFUNCTIONS OF X	0	205	340	340	340	340	340	340	340	340	475	3400
FUNCTIONS OF X	(.5000X)	.0012X	(.0080X)	(.0157X)	(.0219X)	(.0228X)	(.0212X)	(.0197X)	(.0181X)	(.0166X)	(.0150X)	(.6578X)
PRESENT WORTHS OF NET CASH FLOWS (AFTER FEDERAL INCOME TAXES):												
NONFUNCTIONS OF X	0	178	257	224	194	169	147	128	111	97	117	1622
FUNCTIONS OF X	(.5000X)	.0010X	(.0060X)	(.0103X)	(.0125X)	(.0113X)	(.0092X)	(.0074X)	(.0059X)	(.0047X)	(.0037X)	(.5700X)
ECONOMIC WORTH OF PLANT:	\$1,622 ÷ .5700X											\$2,846
PRESENT WORTH FACTORS:	1.0000	.8696	.7561	.6575	.5718	.4972	.4323	.3759	.3269	.2843	.2472	

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EDITOR'S NOTE:

The results of the GAO review relating to AEC's gaseous diffusion plants during which the technique discussed in this article was utilized were reported to the congressional Joint Committee on Atomic Energy on May 20, 1969, in a report entitled "Possible Transfer of the Atomic Energy Commission's Gaseous Diffusion Plants to Private Ownership (B-159687)." This report was published by the committee in its June 1969 Joint Committee Print entitled "Selected Materials Concerning Future Ownership of the AEC's Gaseous Diffusion Plants." On July 9, 1969, the Comptroller General testified before the committee on the GAO review.

# Useful Techniques for Examining Automated Data Processing Systems

721403

By Clarence O. Smith

**This article describes the approach used during a GAO audit of a large automated centralized payroll system. The article illustrates the applicability of the principles of good internal control to automated centralized data processing operations and suggests techniques for testing the effectiveness of those controls during the audit.**

Almost from the day that automatic data processing systems came into use as a management tool, management controls over these systems have not been effective enough to ensure reliable and accurate output. In some cases the results were so poor that what began as management's "dream" of effectiveness and efficiency turned into a "nightmare" of error and confusion.

As fourth generation computers move more toward the concepts of "data base management," "management information systems," and "total information systems," the need for strong management controls tends to become even greater because more operations are performed automatically by the computer without human intervention and there is less chance that errors will come to someone's attention. As automated data processing systems become larger and more complex, the

type, nature, and effectiveness of these controls become even more significant.

The need for, and virtual indispensability of, effective management controls over a computer system was brought forcefully to our attention during the GAO review of a large automated centralized data processing system which other staff members of the Washington Regional Office and I were called upon to perform.

## ***The Problem***

Our assignment was to evaluate the reliability of one of the largest automated centralized payroll systems in the Federal Government—that of the Department of Health, Education, and Welfare.<sup>1</sup> This system processed pay-

<sup>1</sup>The results of this work were reported in the Comptroller General's report to the Congress, "Need For Improvements in the Automated Central Payroll System of the Department of Health, Education, and Welfare" (B-164031, Jan. 17, 1969).

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roll and related data for more than 100,000 employees whose annual earnings exceeded \$850 million. More than 100,000 time and attendance reports were processed each 2 weeks in preparing this payroll. About 75,000 of the employees involved had over-time, part-time, or some other form of special pay which required some type of manual pay computation.

Under established time limits, the payroll group was allowed only 3 days for 250 clerks to process these reports and to prepare the special manual pay computations if employees were to be paid on time. In addition, more than 20,000 personnel actions for new hires, terminations, transfers, promotions, demotions, and other changes and thousands of different deduction authorization documents had to be received, processed, stored, and made available for review each 2 weeks. Finally, the employees served by this system were not limited to a specific geographical area but were scattered throughout the United States. Thus, the reliability of the origination of source documents and the timeliness of their transmission to the central office was of paramount importance.

### ***The Audit Perspective***

The objective of our work was to determine how effectively the entire system was working and whether the results it achieved were satisfactory. Thus, we were concerned with whether it was paying employees accurately and on time, whether annual and sick leave balances were being properly accounted for, whether fiscal accounting records accurately reflected operating costs including payroll expenditures,

and whether amounts withheld from employees' pay were transmitted to the proper recipients in appropriate amounts.

These conditions require the establishment of sound management control procedures over data processing operations to detect errors as close to the error source as possible and to ensure that the errors are corrected before data processing is completed. On this basis, the audit was directed toward ascertaining the reliability of existing controls and identifying specific controls required to improve processing operations.

In conducting this evaluation, the staff simply treated the computer as a special tool which had been acquired by management to facilitate the data processing operations. This approach allowed the audit staff to concentrate their efforts on the flow of documents through the organization and on ascertaining the accuracy and reliability of actions performed on those documents rather than becoming overly concerned with the technical operations of the computer.

### ***Audit Approach***

In line with the concepts cited above, the audit was divided into two major phases: (1) the evaluation of the system of internal control and (2) the evaluation of the records produced by the data processing system.

From previous experience, we have concluded that, where automated data processing systems are involved, the need for internal control is even greater than where the work is performed manually. This need arises because the com-

puter cannot think and will accept data that a person would reject as unreasonable. Also, the computer's extremely fast internal processing speeds turn out data at rates unprecedented in manual systems. Consequently, some types of control omissions can produce errors in wholesale quantities in very short periods of time.

Recognizing the need for good internal control, we divided the internal control system into four functions: input, processing, output, and feedback.

This concept allowed the audit staff to easily associate every procedure in the entire automated centralized payroll system with one of the four functions identified above. In addition, each function was then analyzed to the extent necessary with emphasis on ascertaining the reliability of the input, processing, and feedback functions. If these three functions prove reliable, the same degree of reliability may then be placed on the output. These were considered to be the three most critical functions in the entire system requiring a high degree of reliability.

### ***Nature of An Automated Internal Control System***

In a manual system good internal control relies on such factors as human alertness, care, acceptance of responsibility, and division of duties. When evaluating the system under study, we tested for manual controls normally expected to exist in any system, new controls necessary with automated processing, and controls which substituted for those controls in manual systems that were based on human judgment and a division of duties.

For example, in this system manual controls normally expected would include record counts established at the point of origination and predetermined control totals on the number of hours worked for each batch of records forwarded to the central office. New controls necessary with automated processing would include echo checks—a check on the accuracy of data transmission between computer devices—or dual circuitry intended to help ensure the accuracy and reliability of data transferred from one computer device to another. Finally, controls which substitute for human judgment would include limit checks to prevent issuing a paycheck for more than a predetermined maximum amount, check digits which help ensure the validity of a set of numbers to which they are related, or control totals which help detect the loss or nonprocessing of data.

It was our view that, if any of these controls were absent or ineffective, the system would be exposed to an unnecessarily high risk of error.

Thus, the controls in an automated data processing system should provide reasonable assurance that the processing is carried out correctly. They should detect errors and irregularities promptly and ensure proper corrective action.

Our tests to determine the existence and effectiveness of internal controls were made primarily during the evaluation of the input, processing, and feedback functions. These tests are best illustrated by describing the general flow of documents through the entire system. It should be noted for

the purposes of the illustration that all actions from the collection of data to final processing reflect the actual conditions disclosed in the system being examined.

### The Input Function

Under the system being used, all payroll documents were to be prepared at field locations and forwarded by mail to the central office. The central office was to acquire the equipment and the personnel necessary to convert, edit, and record pertinent payroll information on magnetic tape. The magnetic tape was to be processed at a location other than the central office.

This system was also to provide for the use of the employee's social security number as his identification number; the automatic issuance of a paycheck if an employee had sufficient collateral in the form of unused leave or retirement benefits; and for the automatic accumulation of all related fiscal, personnel, and leave accounting.

Since computers are only as reliable as the people who design and operate them, we evaluated the effectiveness of

- Controls intended to ensure the accurate and timely origination of source documents.
- Controls intended to ensure the timely transmission of source documents to the central office.
- Controls which help determine the accurate and timely conversion of data to machine-readable language.

In this system, as in most automated data processing systems, the origination of source documents was performed by manual operations. In addition, source

documents were originated by more than 4,000 timekeepers, 57 personnel offices, and 110,000 employees. This means that good internal control procedures must be established over the collection of the data recorded on those documents because all subsequent processing operations must be based on the acceptance of the source document at face value.

Tests of the procedures used to originate source documents showed that controls were quite lax over the collection of data, the data recording function, source document origination, and data transmission to the central office. For example, timekeepers frequently preposted employees' attendance reports.

Experience has shown that preposting reports often leads to errors because there is a tendency to overlook differences between actual attendance by employees and the attendance preposted. Thus, employees can be paid while on leave without pay or underpaid for overtime work because these conditions were not accurately recorded on the reports. In addition, the lack of reliable supervision over the timekeeping functions omitted one of the checks intended to help ensure that the reports were clerically accurate and forwarded to the central payroll office on time.

Other commonly recognized controls that were omitted were record counts and a predetermined control total of the number of hours worked. For these reasons, the central payroll office could not be assured that it had received all the documents and records forwarded to it by timekeepers or others. In addition, the accuracy of the conversion of



the reports to machine-readable language at the central office was not verified because timekeepers did not pretotal the number of hours to be paid for each batch of reports forwarded to the central office.

To summarize the conditions existing because of the absence of certain controls over the input function, we noted that there was no assurance

- That source document origination procedures would result in the preparation of accurate documents,
- That all source documents would be forwarded to the central office and that they would be forwarded on time,
- That the central office received all the documents that had been sent to it,
- That all the documents received by the central office would be converted accurately to machine-readable language or that they would be converted in a timely fashion, and finally,
- That the converted documents would be introduced into the processing function in an accurate and a timely manner.

For these reasons, the control over the data forwarded to the central payroll office by the field locations used as a basis to start the processing function did not provide and did not ensure the degree of reliability required by subsequent operations and management.

#### **The Processing Function**

For this system, the processing function was considered to include the man-

ual procedures necessary to receive the documents in machine-readable language, to make final preparations for machine processing operations, and to transmit the documents to the machine processing locations. In addition, this function included the machine processing of the data and the appropriate transmission of the results of that processing operation to the groups responsible for its final distribution or storage. Controls normally associated with these operations include:

- Controls to help ensure the accurate transmission of data from one computer device to another.
- Controls necessary to detect hardware malfunctions.
- File controls to guard against the misuse of files stored on machine-readable media, such as paper tape, punched card, or magnetic tape.
- Programmed and procedural controls to guard against system analyst, programmer, and computer operator error or unauthorized intervention of processing operations.

Such operations require an extensive system of both manual and machine controls to ensure a high degree of reliability on the results of those operations. Controls of this type would include checks to ensure that all the data and documents received for processing were actually introduced into the processing function. Other types of controls would include crossfootings and other arithmetical verification procedures intended to ensure the accuracy of the results of this function. In this respect, a limit check would be a useful

control to preclude the issuance of paychecks for more than the maximum amount specified by law. Still other types of controls, such as dual circuitry and echo checks, could be used to help ensure the accuracy of the data transmitted from one computer device to another. The appropriate segregation of duties and responsibilities within the computer facility itself is a very common type of control. For example, programmers should not have direct access to computer facilities or to operating (production-type) computer programs except under closely controlled circumstances. Frequently, magnetic tapes, system documentation including computer programs, and master file data are maintained by a tape librarian. A tape librarian does not allow direct access to any of this data except on proper authorization from appropriate management officials. Two additional types of controls worthy of mentioning at this point are checks to reconcile processing totals with predetermined control totals and up-to-date complete system documentation. Checks to reconcile totals with predetermined control totals help ensure the accuracy of the processed data. System documentation must be maintained on an up-to-date basis if management is to have any knowledge whatsoever of the exact manner in which the processing function is being performed. Also, it is necessary to have this information available before any modifications or improvements can be made in the system.

Tests to ascertain the extent to which those or similar controls had been incorporated into the system disclosed that the system was operating without

the benefit of any of the controls previously cited. In addition, the tests showed that the original systems design provided for the automatic issuance of a regular 80-hour check every 2 weeks. In the event attendance reports were not received on time, an employee was to be issued a regular 80-hour check provided that he had sufficient leave or retirement benefits that could be used to recover any overpayments resulting from this procedure. It was planned that the automatic issuance of a check concept would not be used unless the leave accounting function was also automated as the principal control to prevent the issuance of improper paychecks. However, the tests used to ascertain the effectiveness of this control disclosed that the automatic issuance of a check concept was used without automating the leave accounting function. Thus, a required form of control was not used in this system. Finally, when employee master files were created, no controls were applied that would preclude establishing a master record for an employee who had already resigned.

Therefore the following conditions were attributable to the absence of reliable controls over the processing function because there was no assurance

- That this function received and processed all the data and documents that it was required to process.
- That the data and documents would be accurately processed on time.
- That processing errors would be detected before issuing checks to

employees and other affected organizations, such as the Internal Revenue Service, the Civil Service Commission, unions, or charitable agencies.

Now, let us examine the feedback function to ascertain whether any of the controls cited in the previous sections of this article would have been beneficial to the system.

#### The Feedback Function

Generally, this function is defined as a form of output which is intended to be used as additional input to correct any discrepancy between what the system is doing and what it should be doing. In this case, returned checks represented a most useful form of feedback which indicated the degree of reliability that could be placed on the system.

For example, we found 1,451 Government paychecks and 89 personal checks totaling about \$304,000 which had been returned to the central office because the checks had been issued erroneously. To the extent possible, the checks have been categorized in the

table shown below by the types of errors involved.

*Payments to prospective employees who never reported to duty.* In most instances this condition was attributable to the processing of termination documents several months after they had been received at the central location. Record counts and predetermined control totals would have been helpful in preventing this type of error.

*Payments to employees who had resigned 1 to 24 months previously.* Several factors contributed to this condition including faulty computer program logic. First, management controls over the clerical procedures used to create master files at the time the system was originally automated did not prevent the creation of records for employees who had already resigned. Since the employees had previously resigned, termination documents would not be received or processed after the record was created as a normal means of removing the employees from the Department's payroll. Therefore, the automatic issuance of a check concept frequently caused the issuance of a nor-

Types of errors	Number of checks	Total amount of checks
Payments to prospective employees who never reported for duty.....	7	\$1, 528
Payments to employees who had resigned 1 to 24 months previously..	257	41, 119
Payments to employees who were on leave without pay.....	105	16, 083
Payments to intermittent employees for periods when they were not employed.....	16	2, 295
Duplicate and triplicate payments to employees for the same period or purpose.....	68	17, 171
Checks issued in incorrect amounts.....	230	52, 117
Unclassified because of missing documents.....	857	173, 677
<b>Total.....</b>	<b>1, 540</b>	<b>303, 990</b>

mal 80-hour check to the former employees each 2 weeks. Also, normal 80-hour checks would be issued under certain conditions when a lump-sum payment for an unused annual leave transaction was introduced into the system. This latter condition was attributable to faulty computer program logic which caused the lump-sum payment transaction to override and destroy the only control in the system that could mechanically prevent the issuance of the erroneous check. The lack of system documentation prevented the user's identification of this problem.

*Payments to employees who were on leave without pay.* In several instances, these errors were caused by the timekeeper's preposting an employee's attendance record. In other instances, this condition was attributed to the late receipt of the attendance reports. In this system, employees were paid for a normal 80-hour period if attendance reports were not received on time.

*Payments to intermittent employees for periods when they were not employed.* This condition was attributable to faulty computer program logic. In this case, the computer automatically added an 80-hour tour of duty to the employee's master record unless some other tour was specified at the time the master record was created. Since intermittent employees have no specified tour of duty, the computer automatically entered the 80-hour tour of duty on the employees' master records. This enabled the employees to receive each 2 weeks a normal 80-hour paycheck when they did not work.

*Duplicate and triplicate payments to employees for the same period or purpose.* This condition was caused by the failure to use procedures that would prevent a source document, such as a cash award or lump-sum payment, from being introduced into the processing function more than once.

*Checks issued in incorrect amounts.* Many missing controls contributed to this condition. For example, the lack of a limit check allowed a gross overpayment of \$3,044.80 to one employee. The overpayment resulted from the use of a *daily* rate of \$43.68, formerly paid to the employee, as an *hourly* rate in computing the employee's pay. Had a limit check of \$996 been in effect—the maximum gross amount payable to a general schedule employee at that time—a paycheck of such a large amount would have been rejected by the computer and the operator would have been put on notice that an error had occurred.

The foregoing discussion describes only a few of the controls omitted in this system and the adverse results attributed to those omissions. Of particular interest was the fact that many of the errors were not detected until the employees returned the erroneous paychecks or made some inquiry regarding the amount of pay they had received. Thus, controls over the feedback function were not sufficiently reliable to assure management that errors could be detected and corrected before data processing operations were completed.

Since controls established over the input, processing, and feedback functions did not ensure a high degree of

reliability on the operations of the system as a whole, it was not considered necessary to examine the output function in great detail. In this respect, the evaluation of the feedback function, which in reality is a form of output, was sufficient to ascertain the degree of reliability that could be placed on the various types of output produced by the system. The lack of effective controls over the other three functions minimized the reliability that could be placed on the system as a whole. For these reasons, the system did not come close to meeting the original objectives specified by management and an extensive and complete redesign effort has been required to resolve these problems.

### **Summary**

The need for, and virtual indispensability of, effective management controls over a computer system is a necessity to ensure a high degree of reliability on automated operations. Effective techniques for examining automated data processing systems must be developed by the audit staff who must "tailor" those techniques to the specific system being examined. However, several audit concepts are common to any automated system and provide a sound basis for initiating an examination of that system.

First, the audit can be divided into two major phases: (1) the evaluation of the system of internal control and (2) the evaluation of the records produced by the data processing system.

Second, an automated data processing system can be thought of as consisting of four functions: input, processing, feedback, and output. Controls

associated with each of these functions could be considered to be a fifth or additional function of the system. In this respect, every procedure in the entire system can be identified with one of these five functions. Treating the computer as a management tool, such as an adding machine or desk calculator, assists the auditor in developing the proper perspective in performing an examination of this type.

Finally, tests should be developed by the audit staff to ascertain the existence and effectiveness of manual controls normally expected to exist in any system, of new controls necessary with automated processing, and of controls which substitute for those controls in manual systems that are based on human judgment and a division of duties.

If these controls are absent or ineffective, the system may be exposed to an unnecessarily high risk of error.

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### EDITOR'S NOTE:

During the examination of this system, the GAO auditors made technical suggestions for its improvement. The Department initiated action to improve the payroll system, including a complete redesign, strengthening of the administering staff, and correction of errors in the data in the system. In the formal report to the Congress, the Comptroller General recommended that the Secretary of HEW assign a high priority to the redesign of the system and keep these efforts under close surveillance until the redesign is successfully completed. The report also recommended that Department officials take full advantage of information available from other agencies that have already developed effective automated central payroll systems. Further, the report recommended that HEW's internal audit organization be consulted in the redesign of the system to help ensure that adequate controls were established and adequate audit trails were provided.

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## Human Resource Accounting

By Earl J. Ogolin

**This article discusses the challenging idea that accountants should expand the scope of their discipline to account for the value of an organization's most important resource—its employees.**

In May 1969 I had the privilege of attending the University of Michigan's Executive Development Program. An idea advanced during the program that struck me as being particularly provocative was that an organization should account for the individual worth of its employees.

How many annual reports have we seen, or heard read, where a statement alludes to the employees as being almost indispensable? We all know the phrase "Our employees are our most valuable asset." Yet where on the balance sheet do we see any reflection of this valuable asset?

How does one measure the value of these assets? Are they being used effectively and efficiently? Are their values decreasing or increasing?

Are these difficult questions to answer? Under today's methods and practices, YES! Today, about the only human resources reflected in any way in an organization's financial reports are the contracts of professional athletes. And yet, one doubts whether the club's books are adjusted upward or

downward on the basis of a good or bad year for each performer.

For example, how does one reflect in one organization's records that five top management personnel left and went to a competitor? They must have had some values since, on Wall Street, the value of one company's stock dropped \$88 million and the other gained \$48 million when it happened.

What happens to the costs of recruiting, training, development, and other such outlays? Under our present practices, we write them off as expenses. Why can't we get information on the condition and value, current and future, of human resources and how they are changing? Our present methods and systems do not provide for it.

As Dr. R. Lee Brummet, professor of accounting, University of Michigan, explained to us, accounting systems do not provide this important information. Accordingly, as Dr. Brummet pointed out, accountants face a challenge which they can no longer ignore. As a result, Dr. Brummet and two associates are engaged in a research project, in co-

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operation with an Ohio manufacturer, to study the methodology and procedures needed to account for "Our most important asset."

We need human resource information in order to properly plan and to effectively control our operations. Under our present conservative methods of accounting, we treat costs for hiring, etc., as expenses instead of trying to ascertain what future values may be inherent in these outlays that may justify establishing an asset value. Part of our problem may result because economists traditionally classify expenditures for human resources as "consumption" and because accountants have, through convention, treated this type of consumption cost as "expenses." Conversely, economists call expenditures for equipment, buildings, etc., "capital," and we have traditionally referred to these items as "assets."

Generally, we know that classifying an item as an expense or an asset hinges on the future service we expect to receive from the expenditure. Now, as Dr. Brummet pointed out, human resource costs, which are sacrifices incurred in obtaining services with the objective of deriving future benefits, can be classified either as assets or as expenses. He continued that these costs should be treated as expenses in periods in which benefits result. He went on to point out that, if these benefits relate to a future time period, they should be treated as assets.

At the present time, financial officers use elaborate methods to make decisions relating to outlays for capital items. But for the human assets, we assume that they have no future values,

so we do not employ such methods in our decisionmaking. Human resource accounting would make it possible, in making decisions, to evaluate the investments in these assets. We should consider the heavy outlays for training programs and the future benefits to be received. We should also consider means for valuing a human's worth to the organization so that we can determine whether he has stagnated and what resources it will take to either rejuvenate or revitalize his capabilities. To be sure, some will say, "Oh, but we do something like that already." Yes, but can we assure ourselves that the decisions we make relative to human resources are the best possible under current conditions?

Presently, our financial management systems are not attuned to this type of program. In fact, these thoughts fly in the face of conservative accounting tradition and, by some persons, may even be considered heresy.

Many of the ideas and terms used to develop human resource accounting come from conventional accounting. Although familiar accounting concepts are used, human resource accounting as presently conceived is not to be used in published financial statements. The system is designed to record data and obtain information needed by operating management. It is oriented in the future and need not deal only with present transaction data.

The human resource accounting system, when fully developed, should measure these assets in terms of the cost to acquire, cost to replace, and continuing future value. The costs to acquire pose no real problem. Our

present systems show this from transaction inputs. A system to show how much it would cost to replace existing resources in terms of recruiting, training, development, etc., should be established. The continuing future value can be represented by the present value of future benefits which can be linked to the human resource. For example, is the employee valuable as a trainer and developer of leaders? does he seek out and perform the difficult? or does he await orders? if we lose him, what is the lost value? Measurement of human resources should assist in recognizing and defining problems.

One of the problems which a well-developed system may recognize and define is employee turnover. Managers generally agree that turnover is costly. Under present systems there are no real ways to measure the extent of these costs. With a proper human resource accounting system, one might be able to pinpoint the causes, decide on what remedies could be effected, and eventually measure the results of such efforts.

For example, if a factory production was to be increased and management had alternatives between expansion and remaining a one-shift operation or merely establishing a second shift in present surroundings, a survey of employees may determine attitudes of accepting night work or leaving. With this type of information from a properly designed human resource accounting system, an expected cost of turnover and retraining could be calculated for consideration in making the final decision.

Dr. Brummet pointed out that some industrial psychologists, notably Dr. Rensis Likert of the University of Michigan, believe that we may be able to pinpoint those managers who put pressures on employees to increase current profits while liquidating the human assets' initiative and motivation and who thus ignore the long-term potential of the employees. A human resource accounting system could provide indications of the value of these resources and the net income could be adjusted to show changes in the values of various human resources. An adjustment of this sort could give us a better measurement of the effectiveness of these managers and employees.

At the present time, research in the area of human resource accounting is focusing on three broad areas:

1. Development of human resource accounting systems in a number of organizations. One company installed the system in January 1968. Currently the researchers are negotiating with two other firms to install the system.
2. Formulation of a body of generalizations about ways in which information provided by such a system should be used in planning and controlling.
3. Preparation of a set of generalizations about the behavioral impact of a human resource accounting system. The basic objective will be to ascertain how people may feel about being looked on as an asset with a dollar figure attached to their names.

As can be seen from the above, the development of the accounting systems



in a number of organizations will be followed by a second phase which will monitor the manner in which the systems are being used so as to assist in extending management's know-how. This, in turn, should increase knowledge of the application of the system. It is anticipated that simulation may be used to ascertain whether decisions affecting employees can be modified when information about human resources is injected into decision models.

The basic objective of the last phase of research will be directed at determining how an employee acts or reacts to being considered as a resource and having a monetary value attached to him. This last phase of research will endeavor to ascertain whether the employee's knowledge of the investment in him affects his attitudes or productivity and whether any knowledge of different

values set for different individuals—either above, below, or on the same management level—will affect employee-employer, worker-boss relationships.

This transition will not be immediate. There will be scoffers. But—in the near future—we may not wonder when someone says “Our employees are our most valuable asset.”

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Further information on this concept is contained in articles authored by Prof. R. Lee Brummet in the March 1968 issue of *Michigan Business Review* and the January 1969 issue of the *Monthly Labor Review*. See also page 54 of this issue of the *GAO Review* for commentary on Professor Brummet's discussion of this subject at the 1969 meeting of the National Association of Accountants.

# An Economist in GAO

By Nicolas F. DeMinico

**For some time GAO has been recruiting individuals trained in disciplines other than accounting. In this article, the author describes his experiences and shows that a person with a background other than in accounting can find satisfying employment with GAO as well as be a contributor to its efforts.**

In recent years GAO has been called upon to undertake an ever-increasing workload, the nature of many of these assignments being as remote from debit and credit as the little red schoolhouse is from the concept of the central school.

For the past 3 years, the policy of GAO has been to recruit along with accounting majors, university graduates trained in other disciplines.

As an individual trained in economics who has been with GAO for a short time, it is my opinion that, aside from the question of professional development, there is a genuine need within GAO for persons trained in various disciplines. Moreover, if the variety and nature of the work GAO undertakes are considered, it soon becomes clear that the question of the need for staff members trained in a variety of disciplines is in reality an academic one. What seems to be most needed in every staff member is an abundance of common sense.

When I reported to the Boston Regional Office, one of the assignments the office was engaged in was a review of the economic assistance being rendered to the Republic of Liberia. The staff members assigned to the job had recently returned from Africa, and they were in the process of analyzing the data which had been accumulated. It was my job to review the National Development Plan of Liberia. Admittedly, I am far from being an expert in economic development and growth, which is a specialty within the broad field of economics; however, I felt sufficiently comfortable in doing this job, having had academic coursework in this area. In view of the economic jargon in which the plan was couched, it was difficult for me to see how one without some training in economics could be expected to analyze such a document. Moreover, as the job progressed, it became increasingly evident that there were areas where the standard methods of evaluation were not going to suffice.

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For example, how does one measure the impact of X amount of dollars on an educational system or determine the significance of spending more money on infrastructure, i.e., transportation and power facilities, as opposed to spending it on direct productive activity?

If anything, a review such as the Liberian assignment disclosed the value of having someone who, though he may not provide the answers, at least recognizes what problems are most likely to be encountered. The recognition of a problem is a major step toward its solution.

I was grateful for the Liberian assignment since it provided me with an opportunity to exercise my knowledge of economics and at the same time introduced me to the methodology of GAO.

After the Liberian review, I was assigned to a review of the Federal Water Pollution Control Administration (FWPCA). The objective of this agency is to insure a supply of water of adequate quality for all beneficial purposes, including public water supply, propagation of fish and aquatic life, recreation, and agricultural and industrial uses.

A review of an agency such as FWPCA offers another example of an assignment where both a knowledgeable accountant and, in this particular case, a person with a background in either economics, operations analysis, systems analysis, or statistics could provide assistance. This is not to say that the assignment could not have been done without the aid of such people but that having them there would be advantageous. The cost of clean water is stag-

gering. In light of the fact that there is only limited funding available and so many things to spend it on, good sense decrees that whatever money you are given must be spent for clean water in a systematic way; i.e., in a way that will obtain the most return for your money.

Nothing would please me more than to be able to say that this modicum of knowledge was my contribution to the review, but, such was not the case. However, in the course of the review when I was asked if an approach to clean water involving alternatives whereby a decisionmaker could be presented with choices were possible, although unable to state how such an approach could be accomplished because of the technological aspect of the problem, I could offer the knowledge that this was indeed a valid approach and one which economists have dealt with since the time of Adam Smith; i.e., the theory of choice.

The more I learned about GAO methodology the more I came to realize that in order to better understand GAO it would benefit me to acquire a broader knowledge of accounting. In addition, I felt that by having such knowledge I would be better prepared to work on those assignments which have no economic significance and thus could be afforded a better opportunity to achieve all-round experience. It was with these thoughts in mind that I applied for permission to take a course in intermediate accounting, having already had the courses in accounting principles. I have since satisfactorily completed this course and intend to go on further.

My exposure to GAO methodology stood me in good stead when unexpectedly I was asked to do a review within a review on the personnel and staffing of FWPCA. It is to the credit of GAO that, despite the limited training I had and in full knowledge of my even more limited experience in GAO work, I was entrusted with such an assignment. I felt myself rising to the challenge, determined to do a good job. It came as a pleasant surprise to learn that, in the undertaking of such a review, it mattered not whether your background was in accounting or zoology; but what did matter was the ability to think, to be analytical, and above all to exercise common sense. The experience gained in interviewing knowledgeable people in responsible positions was worth a countless number of courses on the technique of interviewing. As to the

writing of the report itself, it is difficult to describe the satisfaction I derived when I saw something I wrote in a report to a congressional committee.

I doubt sincerely whether I would have had an opportunity to assume such responsibility so soon elsewhere, either in another public agency or in private industry.

To my mind there can be no more convincing proof that an individual trained in a discipline other than accounting and willing to put out the effort will be able to do well in GAO. Such an individual should view his position in GAO as one in which he can have the better of two worlds. His discipline should be to him an added advantage, especially since more and more of the reviews performed by GAO lend themselves to an interdisciplinary approach.

# Preparing for and Taking the CPA Examination

By Simon Bonderow and Frederick E. Harzer

**This article relates the experiences of the authors in preparing for the CPA examination in Pennsylvania and presents some suggestions for those who aspire to become certified.**

## ***Introduction***

Certification has long been the initial milestone of achievement sought by graduate accountants in the public and governmental areas of our profession. Although certification may not be a prerequisite for the fulfillment of our auditing and reporting responsibilities, its importance as a mark of professional recognition cannot be minimized. Therefore, when State criteria provide for recognition of Government accounting and auditing experience, becoming certified can be an important goal in the individual's continuing professional development program.

In August 1967 the State Board of Examiners of Public Accountants of the Commonwealth of Pennsylvania announced a decision which has had a pronounced influence on the long term professional aspirations of many members of the Philadelphia Regional Office staff. The Board agreed to consider on a case-by-case basis the Government experience of personnel of certain Federal agencies, including the General Accounting Office, with respect

to meeting the experience requirements to sit for the CPA examination.

## ***Accepting the Challenge***

In January 1968 the Philadelphia Regional Office offered an advanced accounting and auditing study program for 42 members of its staff who had signified an interest in such a program. The purpose of the program, supervised and given by professors from a local university, was to update and sharpen the accounting and auditing skills of staff members, particularly those who had been out of college a few years. Furthermore, the study program offered a basis for taking advantage of the Board's decision, provided of course, that the experience of each staff member could qualify him.

After considering this opportunity for a short time, we and 14 other members of the Philadelphia staff decided to sit for the CPA examination in May 1968. With some assistance from the administrative staff, we prepared summaries of our experience and submitted them with our applications and other required personal data to the

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Board. In April 1968 the news arrived: the Board qualified all of us for the examination. This was good news to the many of us who had hoped to become CPAs since our days in college when we had decided to make a career of accounting and auditing.

### *Preparing for the Examination*

Thorough preparation is the most important factor; without it development of the knowledge and confidence needed to withstand the pressure of time and competition is difficult. We believe that the adequacy of preparation depends greatly on having a meaningful purpose or motivation supported by a good study plan and a rational commitment of time and effort. Luck also has some bearing on ultimate success.

Because of the magnitude and complexity of concepts, problems, and assorted recall-type information, complete preparation or the development of "strength" in all aspects of preparation is virtually impossible. This fact alone should help to put all candidates on a competitive basis, all other things being equal, and the knowledge and understanding of this fact can do much to develop self-confidence. Also, a candidate may be fortunate in having an examination that is generally oriented to areas in which he is particularly well prepared or experienced.

Returning to the matter of preparation, we found that certain initial considerations were necessary. For example, if a candidate is married, any commitment of time should take his family into consideration since worthwhile preparation will require disci-

pline and sacrifice from both the candidate and his family. In reality, the preparation becomes a family project. In our own families, social engagements and family affairs, in general, lost all semblance of normalcy.

With small children in the family, finding a study area both quiet and convenient also posed a problem. Fortunately for one of us, a fellow candidate with the same home problems obtained permission to use a local church library for study during weekday evenings. The absence of distraction provided by this environment was invaluable in promoting effective use of time.

Our total study time outside the classroom amounted to about 300 hours. More than 80 percent of this time was devoted to accounting practice and theory. As far as the auditing segment of the examination was concerned, we believe that our daily experience in preparing and following audit programs and in evaluating internal controls and other aspects of financial management gave us an edge.

We attempted to maintain a fairly strict and disciplined control of study time. Each weekday evening we used between 2 and 3 hours and each Sunday about 4 hours. From January through mid-May, about 6 hours were spent each Saturday in the classroom. Although we initially tried to study more than 3 hours an evening, we soon found that the latter part of the sessions was not very productive. Eventually 2 hours an evening proved about as productive as 3 had been and the shorter hours improved our dispositions.

A large part of our efforts for the practice part of the examination was spent in solving problems and reading text material as a guide to solutions. We tried to work one or two problems of each basic type such as partnership liquidations; job order, process, and standard costs; installment and consignment sales; direct costing; and profit volume analysis. Other efforts in the practice segment were directed to understanding the accounting theory behind problem solution methods and to preparing a file of skeleton formats used in problem solving. This latter approach proved most valuable in providing a basis for reviewing accounting practice areas just prior to the examination.

Preparation for accounting theory was directed primarily to reviewing the Accounting Research and Terminology Bulletins of the American Institute of CPAs, opinion statements of the Accounting Principles Board, and textbook presentations concerning basic accounting principles and the theory surrounding financial statements. After a full reading of the source material, we found that use of GAO's outline of the research and terminology bulletins and an outline that we had prepared from the subsequent opinion statements proved sufficient for reviewing purposes. Knowledge of the information from the above sources proved to be critical for the theory part of the examination.

In the preceding paragraph we made a brief reference to outlines. At this point we would like to say something in general about the preparation and use of outlines. Although in the course of

a study program it seems tedious and time consuming to prepare quantities of outlines and/or notes, their value becomes more and more apparent as the examination dates approach. At this time the pressure increases as you realize how much material you have studied during your weeks of preparation, how little information you seem to have retained, and how little time there remains for study and review. As the period before the examination dwindles from weeks to days, it is very reassuring to be able to refer to a summary of your work—and that is what your outlines and notes become at this point—to refresh your memory and restore your morale.

In addition to the areas of study described above, we scanned recent issues of *The Journal of Accountancy* and read the articles concerning opinion statements in order to be familiar with the latest thinking of practicing authorities in the field.

Although time and effort on the part of the candidate are of major importance, the proper direction of that effort is necessary to make effective use of the time. In this regard special acknowledgment is due GAO for the formal classroom program which served as a framework for our preparation.

### ***Taking the Examination***

When we entered the hall for the first session of the examination, we felt nervous and unprepared despite the time we had spent preparing ourselves. But after looking around and talking to others, we concluded that everyone felt the same way.

In actually taking the examination, we provided some form of answer to

each problem. We spent the allotted time and no more on each one. In this way we were able to give attention to the complete examination. We were not completely satisfied with this approach as it pertained to some problems. With these we knew we could do better if we had more time. In the absence of time, however, we stated what additional steps were required to complete a problem or presented notes on the theory related to the problem. Our approach to the narrative type of theory questions was first to write to the overall theory involved in the question and then to address the narrative to the specific question at hand by relating the individual problem issues back to the overall theory.

### ***Conclusion***

We have presented above some of our experiences in preparing for and taking the examination not with the intention of suggesting that our way was best or even unique. In regard to our

approach to preparation, we recognize that there are many cases on record of candidates who passed the examination without any formal outside training. We do believe, however, that formal training by means of an organized plan of schooling is very important. It presents a systematic and logical plan through which most, but seldom all, of the study material can be covered. With such an approach, plus proper motivation and commitment of effort, and a sprinkling of luck, the goal of certification is certainly within the reach of GAO accountants and auditors.

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#### EDITOR'S NOTE:

The authors of this article, both of whom passed the examination on the first sitting, were the first representatives of the Philadelphia Regional Office to pass the CPA examination after the Pennsylvania State Board of Examiners revised its experience requirements. Subsequent to their success, nine additional Philadelphia staff members have become certified and 16 others have passed parts of the examination.



## How Should Costs Be Determined?

The method for computing costs for purposes of determining the comparative costs of alternative courses of action or for comparing costs with benefits can have an important effect on the results. Should costs be determined on the basis of fully allocating all applicable costs or should they be determined on the basis of including only the incremental costs incident to a change? The method used normally assumes the greatest importance in costing an additional activity or in measuring the savings which would result from discontinuance of an existing activity.

The following sketch provides a useful as well as entertaining insight into some of the considerations involved in this issue.

### *What Price Progress*<sup>1</sup>

In discussing the costs incident to various types of operations, the analogy was drawn of the Restaurant which adds a rack of peanuts to the counter, intending to pick up a little additional profit in the usual course of business. This analogy was attacked as an over-simplification. However, the accuracy of the analogy is evident when one considers the actual problem faced by the Restauranteur (Joe) as revealed by his Accountant-Efficiency-Expert.

*Eff Ex:* Joe; you said you put in these peanuts because some people ask for them, but do you realize what this rack of peanuts is *costing* you?

*Joe:* It ain't gonna cost. 'Sgonna be a profit. Sure, I hadda pay \$25 for a fancy rack to holda bags, but the peanuts cost 6¢ a bag and I sell 'em for 10¢. Figger I sell 50 bags a week to start. It'll take 12½ weeks to cover the cost of the rack. After that I gotta clear profit of 4¢ a bag. The more I sell, the more I make.

*Eff Ex:* That is an antiquated and completely unrealistic approach, Joe. Fortunately, modern accounting procedures permit a more accurate picture which reveals the complexities involved.

*Joe:* Huh?

*Eff Ex:* To be precise, those peanuts must be integrated into your entire operation and be allocated their appropriate share of business overhead. They must share a proportionate part of your expenditures for rent, heat, light, equipment depreciation, decorating, salaries for your waitresses, cook, —

*Joe:* The *cook*? What'sa he gotta do wit'a peanuts? He don' even know I got 'em!

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<sup>1</sup> EDITOR'S NOTE: We have not been able to locate the original source of this paper. If any of our readers can provide us with this information, we will be glad to acknowledge its authorship.

HOW SHOULD COSTS BE DETERMINED?

*Eff Ex:* Look, Joe, the cook is in the kitchen, the kitchen prepares the food, the food is what brings people in here, and the people ask to buy peanuts. *That's* why you must charge a portion of the cook's wages, as well as a part of your own salary to peanut sales. This sheet contains a carefully calculated cost analysis which indicates the peanut operation should pay exactly \$1,278 per year toward these general overhead costs.

*Joe:* The peanuts? \$1,278 a year for overhead? The Nuts?

*Eff Ex:* It's really a little more than that. You also spend money each week to have the windows washed, to have the place swept out in the mornings, keep soap in the washroom and provide free cokes to the police. That raises the total to \$1,313 per year.

*Joe:* (Thoughtfully) But the peanut salesman said I'd make money—put 'em on the end of the counter, he said—and get 4¢ a bag profit—.

*Eff Ex:* (With a sniff) He's not an accountant. Do you actually know what the portion of the counter occupied by the peanut rack is worth to you?

*Joe:* Ain't worth nothing—no stool there—just a dead spot at the end.

*Eff Ex:* The modern cost picture permits no dead spots. Your counter contains 60 square feet and your counter business grosses \$15,000 a year. Consequently, the square foot of space occupied by the peanut rack is worth \$250 per year. Since you have taken that area away from general counter use, you must charge the value of the space to the occupant.

*Joe:* You mean I gotta add \$250 a year more to the peanuts?

*Eff Ex:* Right. That raises their share of the general operating costs to a grand total of \$1,563 per year. Now then, if you sell 50 bags of peanuts per week, these allocated costs will amount to 60¢ per bag.

*Joe:* WHAT?

*Eff Ex:* Obviously, to that must be added your purchase price of 6¢ per bag, which brings the total to 66¢. So you see, by selling peanuts at 10¢ per bag, you are losing 56¢ on every sale.

*Joe:* Somethin's crazy!

*Eff Ex:* Not at all! Here are the *figures*. They *prove* your peanut operation cannot stand on its own feet.

*Joe:* (Brightening) Suppose I sell *lotsa* peanuts—thousand bags a week 'stead of fifty?

*Eff Ex:* (Tolerantly) Joe, you don't understand the problem. If the volume of peanut sales increases, our operating costs will go up—you'll have to handle more bags, with more time, more depreciation, more everything. The basic principle of accounting is firm on that subject; "The Bigger the Operation the More General Overhead Costs that Must be Allocated." No. Increasing the volume of sales won't help.

*Joe:* Okay. You so smart, *you* tell *me* what I gotta do.

*Eff Ex:* (Condescendingly) Well—you could first reduce operating expenses.

*Joe:* How?

*Eff Ex:* Move to a building with cheaper rent. Cut salaries. Wash the windows bi-weekly. Have the floor swept only on Thursday. Remove the soap from the washrooms. Decrease the square foot value of your counter. For example, if you can cut your expenses 50 percent, that will reduce the amount allocated to peanuts from \$1,563 to \$781.50 per year, reducing the cost to 36¢ per bag.

*Joe:* (Slowly) That's better?

*Eff Ex:* Much, much better. However, even then you would lose 26¢ per bag if you charge only 10¢. Therefore, you must also raise your selling price. If you want a net profit of 4¢ per bag you would have to charge 40¢.

*Joe:* (Flabbergasted) You mean even after I cut operating costs 50 percent I still gotta charge 40¢ for a 10¢ bag of peanuts? Nobody's that nuts about nuts! Who'd buy 'em?

*Eff Ex:* That's a secondary consideration. The point is, at 40¢ you'd be selling at a price based upon a true and proper evaluation of your then reduced costs.

*Joe:* (Eagerly) Look! I gotta better idea. Why don't I just throw the nuts out—put 'em in a ash can?

*Eff Ex:* Can you afford it?

*Joe:* Sure. All I got is about 50 bags of peanuts—cost about three bucks—so I lose \$25 on the rack, but I'm outa this nutsy business and no more grief.

*Eff Ex:* (Shaking head) Joe it isn't that simple. You are *in* the peanut business! The minute you throw those peanuts out you are adding \$1,563 of annual overhead to the *rest* of your operation. Joe—be realistic—*can you afford to do that?*

*Joe:* (Completely crushed) It's a unbelievable! Last week I was a make money. Now I'm in a trouble—justa because I think peanuts on a counter is a gonna bring me some extra profit—justa because I believe 50 bags of peanuts a week is a easy.

*Eff Ex:* (With raised eyebrow) That is the object of modern cost studies, Joe—to dispel those false illusions.

# National Association of Accountants Conference Report

The "Golden Jubilee" annual international conference of the National Association of Accountants was held in New York City from June 22 to 25, 1969. The following GAO staff members attended the conference:

*A. T. Samuelson*, director, Civil Division.

*Max Neuwirth*, associate director, Civil Division.

*Frank Zappacosta*, assistant director, International Division.

*Jack L. Mertz*, special assistant to the director, Civil Division.

*Randall D. Conley*, supervisory auditor, Civil Division.

*Donald M. Mutzabaugh*, assistant to the director, Civil Division.

*Gerald J. Wilker*, supervisory auditor, Civil Division.

The Honorable Arthur Levitt, comptroller, State of New York, was the opening speaker. He discussed the importance and stature of his function in the State, its long history (he is the 52d comptroller), the distinguished persons who had previously served as comptrollers and their subsequent rise as national figures including that of Governors of the State and Presidents of the United States, and the audit and reporting accomplishments of his office. He also commented upon computer utilization in the State government and in the course of these comments he made

favorable mention of the article on management information systems by Comptroller General Staats that had appeared in the October 1968 issue of *Management Accounting*.

## ***Government Policies Designed To Help the Business Community***

The Honorable Maurice H. Stans, Secretary of Commerce, said there are early signs that inflationary pressures in the national economy are easing. These signs are evident in the flattening out of some indicators such as retail sales, housing starts, and capital investments. Inflation control will show substantial results in the next 2, 3, or 4 months.

Mr. Stans asked for support for programs of the Administration to provide jobs and business ownership opportunities for minority groups. He also asked the conference to support the President's proposal for extension of the 10-percent surtax.

Mr. Stans also stated that in his opinion the Administration would give no consideration to wage and price controls now or in the foreseeable future. He opined that it would be somewhat unfortunate for the prime interest rate to rise further than the present 1½-percent level. It was his hope that the prime interest rate would begin to decline in the not-too-distant future.

### ***Managing Business in a Changing Environment***

William E. McKenna, Norton Simon, Inc., Fullerton, Calif., said that although every period of human history has been characterized by those living in it as a period of "changing times," what appears to be different in our "changing times" is the pace of the change. New products and processes are being generated at rates that would astound previous generations and the possibilities for further technical advances seem limitless. Changes which evolved over lifetimes and longer in the past, now come and go in a matter of a few years. Consequently the fixed person for fixed duties, who in older societies was such a godsend, in the future could be a public danger.

Mr. McKenna stated that the benchmarks for measuring the accelerating pace of technological changes could be traced by the continuing expansion of research and development expenditures. Research and development expenditures by the Federal Government, industry, colleges and universities, and other nonprofit institutions amounted to approximately \$5 billion in 1953. By 1965 these expenditures amounted to \$21 billion and by 1970 the \$30 billion mark should be reached.

The magnitude of these expenditures alone, Mr. McKenna commented, suggests that the planning process will have to assume a more critical role in determining management success or failure and will place a premium upon a corporation's ability to plan effectively. Some of the reasons why this will happen are (1) the shortening of product life, (2) the increased complexity and

tightened interrelationship of functions within a single organization, together with even more complex relationship with other organizations, and (3) the complexity of determining where the opportunities for success are to be found even with sufficient management capability.

Mr. McKenna noted that his corporate organization, Norton Simon, believes firmly that corporate success in these "changing times" rests on two fundamental principles which in the present environment take on greater emphasis than ever before in business history. These principles are: (1) there can be no success without careful and imaginative planning, and (2) in order to stay ahead of our "changing times," we need to establish the entrepreneurial atmosphere in each of our subsidiaries that is essential for the alert response to change at the action level. Strategic planning and subsidiary autonomy, therefore, are the two fundamental keys to managing successfully in a changing environment.

### ***Operating Within a Multinational Organization***

Gianluigi Gabetti, who is president of the Olivetti Underwood Corp., New York, pointed out that Olivetti is a true multinational with physical assets and people in multiple geographic locations, operating in diversified and dissimilar political, social, monetary, and economic spheres. While an international company may be looked on as a visitor—a transient, a multinational is a resident, must put down roots, become part of the landscape and become a true contributor to the economy, cul-

ture, and society in which the company is working.

Mr. Gabetti said it is inadequate to ask if the management of a group operating on such a global basis is centralized or decentralized. Because if a multinational is not centralized, at least for control and coordination, all of the advantages of their worldwide association are lost and a group organization would in fact not exist. It is, he said, proper to ask which functions and responsibilities are more centralized than others and then to examine the basis for centralized coordination and control.

Mr. Gabetti explained that the parent company actively coordinates and participates in the development of policy and strategy for the affiliated companies as a group and individually, but leaves the detailed direction of operations wholly to the local subsidiary. Plans are developed on a two-way basis from both the bottom up and the top down. Marketing activities, especially, are planned within the local atmosphere, but, after worldwide plans have jelled, are subject to adjustment by the more centralized but directly related plans for production and financial goals. Sales plans are naturally of prime importance, but much attention is also given toward achieving a steady scheduled outflow from the producing plants.

Mr. Gabetti emphasized that "control" cannot mean the passive protection of assets but requires active protection of assets including an evaluation of business transactions to assure that delegated responsibilities are carried out and coordinated. For effective control and coordinating, Olivetti depends

first on information and second on action. Information is more than reports. The bits and pieces of information gathered through organizational relationships, person-to-person contact, are more important, and reports merely confirm or deny, becoming the base for obtaining further information.

Mr. Gabetti pointed out that from the standpoint of the affiliate, this type of structure means that employees of the parent company, of different functional responsibilities but without direct line responsibilities, may be working with their counterparts within the subsidiary, conducting technical consultations and investigations. This professional-to-professional relationship provides better analytical studies and interpretations and avoids the duplication of effort and costs for large staff functions at the parent level. But it emphasizes the heavy responsibility placed on the individual for coordination.

### ***Fundamental Forces in the Economy of the Seventies***

Dr. Pierre A. Rinfret, Rinfret-Boston Associates, Inc., New York, said that the Administration's program for holding down inflation is entirely ineffective, and he predicted there will be no halt in the upward spiral for a minimum of 5 years. Prices will continue upward as will wages and the prime rate for money will reach a level of at least 10 percent by 1972.

Dr. Rinfret said that businessmen who are holding back on expansion are not realistic because money will not get any cheaper under the current monetary and fiscal policies of the Govern-

ment. He said the Administration will not control inflation either this year or next and predicted that the average annual rise in the cost of living in the next 5 years will be double that of the average in the last 20 years. Business volume will continue to grow at a rate of 4 to 4½ percent a year in real terms.

Most of the current inflationary trend was in the area of services, Dr. Rinfret noted, and said that monetary policy could not possibly control such costs. Moreover, he said, the Government was the largest single buyer of services, spending between \$8 billion and \$10 billion annually for services in urban renewal, educational programs that include scholarships, retraining of minority groups, scientific research, and medicine. He said that peace in Vietnam would make no difference in the inflationary cycle because Government spending and deficits would continue in peacetime pursuits. He said, also, that the balance of payments either favorable or unfavorable would not affect the inflationary cycle.

***From Accounting to Top Management: What It Takes To Get There***

H. Edward Wrapp of the Graduate School of Business, University of Chicago, advised those accountants who wish to go to the top, to manage the American business enterprise system, to develop into generalists. Top people have to be generalists in order to direct the diversified and complex activities which are inherent in business today.

Mr. Wrapp enumerated two sets of questions that the accountants aspir-

ing to positions in top management must answer to determine whether they possess the qualifications for advancement to such positions. The one set of questions he labeled as "required" and the other set "unrequired." Appropriate answers to the "required" set were necessary for consideration for top management positions.

Mr. Wrapp emphasized that the following list of "required" questions were not necessarily in the order of importance:

1. How good are you in sizing up significant trends?
2. How nimble are you in knowing what is good in your company?
3. Do you concentrate on a few important trends or objectives but keep yourself adaptable or flexible to changing needs?
4. How sensitively are you tuned into the power structure in your business?
5. Do you have a sense of direction in which your company is going or should go?
6. Are you an opportunist or are you knowledgeable in all phases of your business? Can you support your opportunities?
7. Are you willing to make decisions in areas outside of your discipline?
8. Do you have a personal strategy and how will you do it? What's your plan? What are your self-renewal programs?

Illustrative as elective or "unrequired" questions which would add to the accountants opportunities for selection for top management, according to Mr. Wrapp, were:

1. What do you know about what is going on in the cities?
2. How much do you know about mergers and acquisitions?
3. Do you want to serve your company overseas?
4. Are you knowledgeable about the new decisionmaking techniques?

### ***Accounting for Human Resources***

Prof. R. Lee Brummet of the University of Michigan said that one of the most important aspects of the business manager's job is the use of resources to achieve the immediate and longrun goals of an organization. Managerial effectiveness may be viewed as the ability to acquire, develop, allocate, maintain, and utilize resources. He said that managers presently receive extensive information concerning physical and financial resources but relatively little about their organization's human resources. Consequently, he pointed out, there is a need to develop a system of accounting for human resources and their changes in value through time. Human resources of an organization not only include its personnel but also its customers, suppliers, and creditors.

Dr. Brummet explained how a human resource accounting system could provide information to management to facilitate the process of deciding among alternative investments in human resources and to permit the evaluation of human resource maintenance and utilization. He pointed out that once the organization's manpower needs have been determined, human resource accounting can help facilitate the process of manpower planning by providing

estimates of the cost of recruitment, selection, and induction of people for different positions and by establishing cost standards which can be used to budget manpower planning activities.

Another function of human resource accounting is to provide information upon which to base decisions on whether the costs and benefits to be derived from an investment in training and development is economically justified. For example, he said that an organization may find it worthwhile to invest in acquiring M.B.A.'s rather than B.B.A.'s because of greater savings in development costs.

Dr. Brummet also said there was a need to determine how effectively human resources were being utilized. For example, divisional performance should be evaluated not only in terms of current return on investment or contribution to profit but also by expected future profitability. He pointed out that if the human assets of an organization are being liquidated in order to increase the accounting representation of profits, only an illusion of increasing profitability results.

Richard L. Burrell, controller, R. G. Barry Corp., Columbus, Ohio, explained the joint effort that the Institute of Social Research, University of Michigan, and his company are making to develop what is believed to be the first human resource accounting system. Mr. Barry said that his corporation employs about 1,300 persons in five locations throughout the country. On January 1, 1968, an outlay cost system for the measurement of management assets became operational which was the first step in the development of



sophisticated measurement and accounting procedures to report accurate estimates of the human assets of their organization.

### ***Cost Accounting Standards for Government Contracts***

Bernard B. Lynn, deputy director, Defense Contract Audit Agency, discussed the history of efforts to develop uniform standards, accounts, systems, and reports in federally regulated industries and the work on accounting principles of the American Institute of Certified Public Accountants. He stated that no agreement had been reached after years of effort on some differing treatments accorded identical business activities; that no cost accounting principles had been promulgated; that there was no substantive support for cost principles; and that nothing had been developed on costs by departments, by functions, or by contracts. He expressed the view that the reports on the research projects of the National Association of Accountants had not been helpful in establishing cost principles or in narrowing the number of alternatives. He concluded that cost

principles were necessary to accommodate comparability of financial information for use by Federal contracting officials in evaluating proposals for contract awards.

Richard G. Mulligan, controller, TRW Systems Group, Redondo Beach, Calif., discussed the numerous difficulties in getting uniformity of financial data even between divisions of a diversified company, let alone between competing companies. However, he considered it a foregone conclusion that the GAO would find that cost principles for Government contracts to be feasible and that industry would be faced with imposed cost standards in contracting with the Federal Government. He suggested that industry think about developing alternatives that would be acceptable to the Government. He outlined a possible alternative in which DCAA would complete a check list on the costing practices of competing contractors that would show whether and the degree of deviation by cost elements in the several contracted proposals. Such an arrangement, he said, would be feasible and should satisfy the needs of Government contracting officials.

# American Accounting Association Annual Meeting Notes

The annual meeting of the American Accounting Association was held on the University of Notre Dame campus in South Bend, Indiana, on August 25-27, 1969.

Those attending from the General Accounting Office were:

*Leo Herbert*, director, Office of Personnel Management.

*Harley Climpson*, assistant director, OPM.

*Herbert McLure*, staff manager, OPM.

*William Campfield*, assistant director, Office of Policy and Special Studies.

*William T. Stevens*, on leave from San Francisco Regional Office.

*George Gustafson*, on leave from San Francisco Regional Office.

*Ernest Enke*, consultant, University of Missouri.

Notes of interest on some of the sessions follow.

## ***Measurement Problems in the Social Accounts***

Professor Mancur Olson, Jr., formerly Deputy Assistant Secretary, Department of Health, Education, and Welfare and his colleagues collaborated in preparing a monograph *Toward a Social Report* (U.S. Government Printing Office, Washington, D.C., 1969) which sought to define and discuss the meaning and significance of social indicators. Professor Olson, now at the

University of Maryland, presented examples of problems of assigning "values" in social measurement and reporting.

Social indicators were defined as statistics having two characteristics:

1. They are measures of what economists call "welfare" and "illfare."
2. They should fit into some systematic scheme of classification which makes it possible to obtain a balanced assessment of the socioeconomic progress or retrogression in a broad area of life, as well as permit detailed study of particular problems in the broad area.

Professor Olson argued that the social accounts, i.e., the National Income and Product Accounts of the United States, measure only a small part of the positive and negative welfare of the country. He said that because of this shortcoming, Government administrators are severely burdened in making decisions for optimally allocating the country's resources.

He exhorted accountants to take the leadership in developing better social indicators, and in accounting for and reporting nonmarket transactions. He cited, for example, the need for developing indices of health expectancy as an area for improving positive welfare measurement and reporting. Indices or output measures of crime and pollution are two examples cited by Professor

Olson of negative welfare measurement and accounting that need to be developed.

### ***The Role of Accounting in Developing Social Systems***

A panel consisting of Louis M. Kessler of Alexander Grant & Co.; Shawki M. Farag of the International Bank for Reconstruction and Development; and David F. Linowes of Laventhol, Krekstein, Horwath & Horwath, made the following observations.

Professional accounting is geared for the needs of highly developed industrial nations. Developing nations have generally taken the view that good accounting is a key prerequisite for economic development.

The role accounting plays in a developing nation may differ somewhat from the role it plays in a highly developed economy. For example, there is greater emphasis on central planning for industrial growth and an accompanying desire for accounting to provide useful planning data. To American accountants, this smacks of Government intervention in free enterprise. Developing nations are frank in pointing out that is exactly what it is. A developing nation cannot wait for economic evolution and must rely instead on centralized national planning to achieve in 10 or 20 years what normal economic evolution would achieve in 50 years. Accounting is essential to such centralized planning both in devising viable economic and taxation systems, and in measuring the outcome of plans put into action.

The role of professional accounting is not eagerly accepted by the general

public in developing nations. Management and labor are suspicious of accountants and uncooperative in providing information or assistance. Their attitude is understandable. In Turkey, for example, management is often the scapegoat for inadequate national planning or unsuccessful policies dictated by the Government either of which may prevent profitable operation. The average tenure in office of a manager in Turkey is only 16 to 18 months, and the clear target for blame is the accountant who measures the manager's operational effectiveness.

The situation in Turkey illustrates the need for accountants to develop better means of measuring management effectiveness. The Turkish Government has a policy of total employment. National enterprises, which account for about 40 percent of industry, must therefore absorb and carry any excess labor force that exists. It may be impossible, therefore, for a national enterprise to show a profit on traditional income statement and balance sheet reporting even though the benefits its operations have on the national economy are distinctly positive.

To successfully aid developing nations, accounting must also devise and promote economic measurements which are adaptable to the needs of the individual systems and which can be implemented by practitioners with little formalized training. These measurements must deal with and report on a system in its own terms and values. The need may be for less emphasis on accuracy and greater emphasis on the relevance of accounting information.

### ***Probabilistic Depreciation and Its Implications for Group Depreciation***

Professor Yuji Ijiri and Robert S. Kaplan, of the Carnegie-Mellon University, authored the paper given on this subject. Professor Isaac N. Reynolds of the University of North Carolina chaired the discussion. The report presented was prepared as part of the activities of the Management Science Research Group, Carnegie-Mellon University, under contract with the U.S. Office of Naval Research. The abstract of the paper very well summarizes what was discussed:

Conventional depreciation methods treat the service life of an asset as a given constant. When there is some uncertainty as to the actual service life, an average (expected) value is used. In this paper, we consider an asset whose service life is a random variable with a known distribution. We show that whether or not accelerated methods are used, conventional depreciation methods generally result in underdepreciation in earlier periods of the asset's life compared to a proposed method which makes explicit use of the underlying distribution. The use of parametric distributions to approximate the actual service life distribution is discussed and some empirical evidence presented. The application of the proposed method of group depreciation is considered and it is shown that conventional methods will typically result in underdepreciation throughout the service life of the items in the group.

### ***Toward Probabilistic Profit Budgets***

William L. Ferrara and Jack C. Hayya, of the Pennsylvania State University, authored the paper on this subject. This session was chaired by Morton Backer of the University of Massachusetts. The authors presented the

view that probability theory and techniques could be used to develop profit budgets and summarized their ideas as follows:

The purpose of this study is to integrate, extend, and apply previously mentioned efforts to the construction of probabilistic profit budgets so that students of accounting, accountants, and managers will better comprehend and implement these techniques. A necessary precondition to implementation of probabilistic profit budgets is the development of an accounting system incorporating cost categories and profit contribution measures that tend to facilitate estimation of uncertainty—none of the related studies has considered this issue. The system we recommend is a variation of direct costing. Variable, managed, and committed costs as well as marginal contribution and short-run margin represent distinct problems from the point of view of estimating uncertainty.

### ***Impact of Behavioral Sciences on Accounting***

A panel consisting of William J. Bruns, University of Washington; Jacob G. Birnberg, University of Pittsburgh; and Edward H. Caplan, University of New Mexico, discussed this subject.

In the last 20 years behavioral scientists have made impressive contributions to the field of management both in identifying successful management techniques and in producing new techniques. Behavioral scientists have been instrumental in adapting methods of scientific study to management problems. However, there has been little attempt by accountants to implement these methods, or to assess the implications of behavior on accounting.

The accounting profession has continued on its way without questioning

the assumptions it has traditionally made about the value and impact of its efforts. Behavioral science, as it applies to accounting, is a "tool in search of a task." The accounting profession needs to develop systematic models for direction of research into the effects of behavior on accounting, and needs to determine whether its present assumption about the role and worth of accounting are empirically logical.

An area particularly susceptible to behavioral research is the impact and meaning of traditional financial statements. Behavioral research has gener-

ally indicated that no two people see things alike, and if this postulate applies to financial statements it is possible that they have been generally misunderstood or incorrectly interpreted for many years. Another area in need of investigation is the image of the profession. It is high time accountants find out how the general public views the professional accountant and the role of accounting in society.

Accounting is virgin territory for the behavioral scientists and the profession should encourage behavioral research in a variety of areas of the profession.

## NEWS and NOTES

### ***A Point to Remember About Efficiency***

In a speech in the Senate on September 11, 1969, Senator Case of New Jersey ascribed to "a perceptive admiral" these words of wisdom that are well worth remembering by all auditors:

There is nothing more useless than doing something with great efficiency that should not be done at all.

### ***Weitzel Tribute***

At the hearing on July 15, 1969, by the Subcommittee on Legislative Branch Appropriations of the House Committee on Appropriations on the GAO budget for 1970, the chairman of the subcommittee, George W. Andrews, paid the following tribute to *Frank H. Weitzel*, former Assistant Comptroller General, who retired on January 17, 1969:

I would like to say that my first committee assignment on the Appropriations Committee was with the Independent Offices Subcommittee 20 some odd years ago, and at that time a most attractive young man, Frank Weitzel, appeared before the committee with the then Comptroller General, the Honorable Lindsay Warren. I was most impressed with Mr. Weitzel's ability and dedication as a young man and I watched him through the years appearing before the Committee on Appropriations. I came to admire him and respect him. He was an extremely able, conscientious, and dedicated public servant. He was a man of unimpeachable integrity. He epitomized the very best in long and distinguished service as a career civil servant.

This is the first time that he is not appearing as a witness from the Comptroller General's Office. He was retired. We wish him well and hope that his friends from the General Accounting Office who are here will convey to him our great respect, our gratitude

for his long and distinguished public service, and our statement that we do miss him. I am certain many others in Congress share that sentiment. He was widely known and highly regarded in Congress generally.

### ***One Senator's View on the Role of GAO***

In his opening statement on September 16 at the hearings on GAO audit capabilities before the Subcommittee on Executive Reorganization, Senate Government Operations Committee, the chairman, Senator Abe Ribicoff, offered the following view of the role GAO should play:

It is essential that every dollar spent by the Federal Government be used as wisely and effectively as possible. The GAO can play a major role in this effort by monitoring and measuring the performance of all Federal programs and reporting on them to Congress. This will make the executive branch more accountable to Congress and give us the information necessary to make informed judgments on future expenditures.

### ***Policy on GAO Assistance to the Congress***

At the same hearing, the Comptroller General, *Elmer B. Staats*, provided the following summary of current GAO views on assisting the Congress:

We do not believe that it is the desire of the Congress that GAO *initiate* new program proposals to deal with social, economic, national security, or other problems or needs. Nor do we have responsibility for *initiating* recommendations with respect to program funding levels or budget priorities. In other words, the GAO does not have the authority nor should it seek to become a congressional Bureau of the Budget with responsibility for the review of departmental appropriations requests; i.e., to assess the need for particular

funding levels based upon program needs or the priorities among different programs.

On the other hand, the GAO has played and we believe can play an increasingly important role in assisting both the legislative and appropriations committees in the consideration of new programs.

The work which we initiate on our own is, to an increasing extent, directed toward analyzing or evaluating established programs. We do not, as I have said, direct our efforts to initiating new program proposals. Nevertheless, we produce much information in the course of our self-initiated work that should be useful in connection with congressional consideration of new programs. What I have in mind here is that awareness of the degree of success in meeting objectives of and problems encountered in on-going programs can be of assistance in consideration of new legislative authorizations.

How can GAO be most effective as a staff arm of the Congress and the committees as they consider new legislative proposals? An important need of the Congress in its decision-making role is to know specifically what alternatives exist and whether adequate analyses were made of these alternatives. Congress needs to have available to it information with respect to the projected long-term costs and benefits, as well as the relationship of growth of one program to that of other programs.

Many of these analyses, although made by the executive agencies, are not available to the Congress or to the GAO. The executive agencies frequently consider such information to be of an internal nature, the release of which would tend to inhibit candor among subordinates in providing superiors with their opinions, conclusions, and recommendations. Furnishing projections of future costs likewise offers problems.

However, in a few instances where the underlying studies of alternatives were made available to the GAO, we believe we were able to make useful summaries, highlight significant points, and develop questions, alternatives, and issues for the committees' use.

Additionally, the GAO can assist the committees in formulating requests for executive

branch agencies to evaluate alternatives which it could require in connection with reauthorization or modification of programs. We believe there is a considerable potential for increased utilization of executive branch evaluations.

Briefly stated, we believe that the GAO's assistance role in the consideration of new legislation can be expanded but we believe it should be done only in response to specific requests from committees or from the Congress as a whole. Also, we believe that, as a general proposition, the GAO should refrain from making recommendations for the adoption of a particular program or policy under legislative consideration in view of its responsibility for subsequent independent reviews of the implementation of programs which may be authorized. This does not mean that the GAO cannot make highly useful analyses of alternatives and otherwise assist the committees in attaining all pertinent information bearing upon legislative proposals.

The degree and the rate at which this increased assistance can be provided also depends importantly on two other factors:

- To be productive from the standpoint of the committees and feasible from the standpoint of the GAO, all practicable steps should be taken to avoid time schedules which involve "crisis" evaluations of executive branch proposals, usually many months in the making. Obviously GAO's assistance to the committees can be useful only if adequate time is permitted, and
- The extent to which GAO has available, or can obtain, special skills required to perform the highly technical work required to evaluate alternative program possibilities.

### ***Significant Internal Audit Developments***

The heads of three of the four principal foreign affairs agencies, the Agency for International Development, the U.S. Information Agency, and the Peace Corps, have announced the eleva-

tion of their internal audit and related management review functions to the level of reporting directly to the agency heads or their deputies. These actions provide, organizationally and functionally, for substantive accomplishment of the purposes recommended in recent GAO reports on reviews of internal audit activities in those agencies (B-160759 of January 17, 1969, April 8, 1969, and December 27, 1967, respectively). Previously the internal audit function in the first two agencies was located at the third management level below that of the agency head, and in the Peace Corps at the second lower level. In each case the head of the audit function reported to officials responsible for activities subject to audit.

The Administrator, AID, has established the position of Auditor General, reporting directly to the Administrator and combining the previously separate internal, contract and grant auditing, and inspection and investigative functions. In the USA, the Director has combined the internal audit and the inspection functions with the research and related assessment functions in an Office of Research and Assessment, the head of which reports directly to the Agency Director or Deputy Director. The Deputy Director, Peace Corps, has reestablished the Internal Audit Staff as an organizationally separate entity, the head of which will report directly to him.

The increased stature and independence of internal audit coupled with the assignment of broadened audit responsibilities for reviewing program execution provided by these actions, as well as more effective coordination of the

several means of assessing program execution, should provide a framework for more effective management review results than in the past.

### ***Presidential Endorsement of JFMIP***

President Nixon recently provided another strong endorsement to improving financial systems in Federal agencies. In a memorandum dated August 12, 1969, addressed to the heads of departments and agencies, he stated:

In charting the goals of this Administration, I have emphasized the need to improve the decision-making processes of the Federal Government. We must make our system for delivering program services more effective.

Therefore, I am giving full support to the Joint Financial Management Improvement Program, an indispensable project with a charter to sharpen some of the tools of management.

Under the leadership of the Comptroller General, the Secretary of the Treasury, the Budget Director, and the Chairman of the Civil Service Commission, the Joint Program has promoted many far-reaching improvements in the past. I want to see achievements in the future that will make management of Government operations more responsive and efficient.

To get full measure from the resources available to us, we must have all the necessary management information. We must have financial systems that illuminate every level and stage of decision-making: from the first-line supervisor to the President and the Congress, from the long-range forecast to the critical post-audit. Nothing less will let us go forward with programs that provide the most benefit for the taxpayer's dollar.

I have previously asked for a vigorous effort to convert to the accrual basis for stating budget revenues and expenditures. That high priority goal dovetails with the objective of developing effective financial system, including budgeting, accounting, reporting, and auditing.



I direct the head of each department and agency to join Comptroller General Elmer B. Staats, Secretary of the Treasury David M. Kennedy, Budget Director Robert P. Mayo, and Civil Service Chairman Robert E. Hampton, under the Joint Financial Management Improvement Program, to make the development of effective financial systems a high priority in strengthening administrative practices. Without this effort, our ability to cope with the needs of the 1970's will be seriously impaired.

The challenge is there. I call upon each Federal manager to accept it as a personal challenge. Demand better financial information and use it.

### ***Accounting Systems Approval***

The first accounting system to be approved under the Budget and Accounting Procedures Act of 1950 was approved in 1951 (the Coast Guard). During the period 1952-59, 39 systems were approved.

There was a decided lull in approvals during the 5-year period 1960-64 when only three systems were approved. The slow pace of compliance with the provisions of the Budget and Accounting Procedures Act led to congressional hearings before a subcommittee of the Committee on Government Operations, House of Representatives, in 1964. Continuing congressional interest in improved financial management in the executive branch has been evidenced each year since 1964 by the issuance of a committee report or by holding further hearings.

The executive branch has also supported, at the highest levels, improved systems of financial management. Interest has also been created through the recommendations on accrual accounting contained in the Report of the President's Commission on Budget Concepts issued in October 1967.

In calendar year 1968, an 18-year peak was reached in approval of accounting systems. In that single year, 10 complete systems were approved, three segments of systems were approved, and 15 statements of principles and standards were approved. Agency schedules for submission of accounting systems for approval by the Comptroller General indicate that the pace of improvement will continue to accelerate.

During the 6-month period ended June 30, 1969, GAO approved 12 statements of principles and standards, four Department of Defense instructions and directions, one systems design, five complete systems, and one segment of a system.

### ***Views on Internal Auditing***

The current GAO statement of basic concepts and standards for internal auditing in Federal agencies was distributed to agency officials at the time of its completion in October 1968. With the change in administration in the executive branch, the Comptroller General sent copies of the revised statement to the new heads of departments and agencies in June 1969. Following are selected excerpts from the acknowledgments:

#### ***Secretary of Defense***

I share your view that a strong internal audit program can play an important role in strengthening management systems and improving operating effectiveness.

We believe the internal audit system of the Department of Defense is consistent with the principles and concepts set forth in your statement. However, we shall be searching constantly for ways the function can be made more effective and the General Accounting Office statement provides excellent guidance

## NEWS AND NOTES

to this end. It has been widely distributed throughout the Department.

The General Accounting Office has made many useful suggestions in the past which have helped to shape the organization and scope of internal audit in the Department of Defense, and I shall welcome further suggestions where you feel improvements can be made.

### *Secretary of the Air Force*

I am acutely aware of the need for a strong internal audit system in the Air Force. Although the Air Force Auditor General has done an outstanding job in bringing problems to the attention of top management, we continually strive to update and improve the effectiveness and efficiency of the internal audit function. Your statement of basic principles and concepts will certainly aid us in that objective.

### *Secretary of Commerce*

I heartily agree with you that greater emphasis needs to be placed on the use of the internal audit function to strengthen management systems throughout the Federal Government.

Please be assured that an effective audit program for the Department of Commerce will have my personal interest and attention.

### *Postmaster General*

I concur with your belief in the importance of strong internal audit systems in the Federal departments and agencies. We made wide distribution of this GAO statement to our internal audit staff, when copies were received last fall, and believe that the statement has been invaluable in shaping and developing the Department's internal audit program. I will see that copies of your statement of basic principles and concepts are also distributed to my top staff, and will discuss it with them.

### *Secretary of Housing and Urban Development*

Let me assure you of my continuing personal interest that our internal audit system functions effectively in consonance with your revised statement of basic principles and concepts on internal auditing so as to assist the

Department's management in attaining its goals.

### *Secretary of Health, Education, and Welfare*

We are in full agreement with the basic principles and concepts set forth in the statement.

As you know, the Department has taken several important steps over the past few years to strengthen its audit capabilities. Centralization of all audit functions in the HEW Audit Agency, expansion of our recruitment and staff development programs, and broadening the scope of our audits have contributed to significant progress being made in achieving more effective internal audits.

The Department plans to continue its commitment to a broad, unrestricted audit approach. Our auditors are encouraged, to the maximum extent of their competency, to contribute to the effective and efficient operation of our programs by providing constructive and protective services to our program officials at all levels.

Copies of the General Accounting Office statement have been distributed, with Departmental endorsement, to our program management staffs, as well as to personnel within our Audit Agency. You may be assured of our continued cooperation in your efforts to improve internal auditing in the Federal Government.

### *Director, Bureau of the Budget*

This is excellent guidance material and, I am sure, will be of major assistance to the agencies.

There is much to be done in most agencies to enable the audit program to realize its full potential. We are anxious to lend our support to the further development and improvement of internal auditing and will want to work closely with you towards that end.

### *Administrator of General Services*

I recognize the importance placed on internal auditing by law and by the General Accounting Office, and am aware of the strong congressional emphasis on internal auditing as a means toward better management. Upon my arrival at General Services Administra-

tion, I was pleased to find that the audit organization is established as a part of my immediate office under the Deputy Administrator. This organizational structure and the concepts and principles enunciated in your revised statement on internal auditing have my personal support.

It will interest you to know that my top people are being briefed by the director of my audit organization on the role of internal audits as an essential tool of management.

The internal audit function in General Services Administration will receive my continued support.

*Administrator, Agency for  
International Development*

This new organizational arrangement is in keeping with the recommendations contained in your January 17, 1969, report entitled "Review of AID's Internal Auditing Activities." I'm sure it will increase the effectiveness of our audit, investigation, and security activities.

Our Auditor General reviews and audits will extend over all phases of our operations. We will do our best to operate in accordance with your recent audit recommendations and your new statement of principles and concepts. As we move ahead we will be in touch with you for further advice and assistance.

*Director, Office of Economic  
Opportunity*

I am sure it will prove invaluable, and I certainly intend to discuss the concepts with my staff.

*Director, U.S. Information Agency*

Members of our staff, who have studied the booklet, were pleased to find in it many useful insights with respect to the new look in internal auditing.

*Administrator, Small Business  
Administration*

In line with your suggestion the statement has been reviewed and discussed by our staff. On the basis of this review, we believe that our internal audit system is generally in accordance with the principles and concepts set forth in the statement.

*President and Chairman,  
Export-Import Bank of  
the United States*

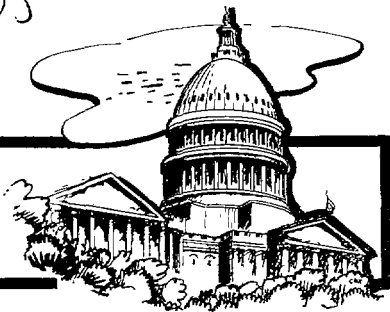
I am in general agreement with the indicated merits of internal auditing although I doubt that its results will usually be as noteworthy in a small agency such as Eximbank as it is in larger agencies. I can assure you that this subject will receive careful attention in the coming months.

*Chairman, Federal Home Loan  
Bank Board*

The Board has supported an effective internal auditing system for many years and I am sure that the revised statement of the General Accounting Office will be an effective guide for evaluation of the internal audit and related activities of this agency.

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# HEARINGS *and* LEGISLATION



By MARGARET L. MACFARLANE  
*Chief, Legal Reference Services, Office of the General Counsel*

## **Unemployment Taxes**

On August 7, 1969, the President approved an act<sup>1</sup> making changes in the unemployment insurance laws including a provision for the collection of Federal unemployment taxes in quarterly installments each year. This was a recommendation made in our report to the Congress on January 24, 1967, entitled "Potential Benefits from Quarterly Collections of Unemployment Taxes" (B-133285). At that time we reported that collection on a quarterly rather than annual basis would enable the employment security administration account to earn considerably more in interest and provide a more adequate balance to meet administrative expenses.

## **Construction Industry**

Another law relating to GAO work, signed on August 4, 1969,<sup>2</sup> amended the Contract Work Hours Standards Act to bring Government construction contractors within the health and safety protection laws applicable to suppliers and service contractors. The law as enacted provided that GAO will distribute the lists of contractors who are found

to have violated the requirements of the law.

## **Postal Reform**

At the request of the House Committee on Post Office and Civil Service, *Robert F. Keller*, general counsel, presented comments on H.R. 4, H.R. 11750, and H.R. 13124, proposals to modernize the postal establishment; and H.R. 1133 and H.R. 1134, relating to appointment of personnel in the postal establishment, at hearings held on August 8, 1969. The statement dealt with the proposals for a corporate structure-type organization for the postal service. (Other participants: Messrs. *Ahart, Ramsey, Schuler, Medico, Cox, and Blair.*)

## **Budget for 1970**

The hearings on GAO budget estimates for fiscal year 1970 were held by the Legislative Branch Subcommittees of the House and Senate Appropriations Committees on July 15 and 18, 1969, respectively.

The Comptroller General presented the justification statements at both hearings. It is at these annual reviews that Congress has the opportunity to review GAO's annual workload as well as its current and projected activities.

<sup>1</sup> Public Law 91-53, approved Aug. 7, 1969, 83 Stat. 91.

<sup>2</sup> Public Law 91-54, approved Aug. 9, 1969, 83 Stat. 96.

(Other participants: Messrs. *Keller, Powers, Morse, Bailey, Samuelson, Hylander, Sullivan, Kensky, Simmons,* and *Cornett*.)

### ***A-7D Aircraft Brake***

The Subcommittee on Economy in Government of the Joint Economic Committee requested GAO to report on the review of the qualification testing performed by the B.F. Goodrich Co. on the A-7D aircraft brake purchased by the Air Force and the Navy under a subcontract with the LTV Aerospace Corp. The hearings before the subcommittee were held on August 13, 1969, and *Richard W. Gutmann*, deputy director, Defense Division, presented the statement. (Other participants: Messrs. *Best, Eibetz, Pederson,* and *Thompson*.)

### ***Gaseous Diffusion Plants Transfer***

Illustrative of a report designed to assist a congressional committee in reaching legislative conclusions was the GAO report on the possible transfer of the Atomic Energy Commission's three gaseous diffusion plants to private ownership.<sup>3</sup> The Joint Committee on Atomic Energy invited the Comptroller General to discuss the results of the review at a hearing held on July 9, 1969. (Other participants: Messrs. *Ahart, Haycock, Sperry, Crowther, Smith,* and *Kane*.)

### ***Licensing of Contractors***

The Senate Judiciary Subcommittee on Antitrust and Monopoly invited the Comptroller General to report on

the evaluation of two procurement methods, Directed Technology Licensing and Parallel Undocumented Development, at open hearings held on July 14, 1969. The subcommittee was apprised of the problems of the evaluation and the basis for concluding that the Parallel Undocumented Development plan was more useful for acquisition of certain kinds of weapons systems hardware. (Other participants: Messrs. *Keller, Gutmann, Hammond, Hall, Desmond,* and *Kane*.)

### ***Guaranteed Student Loans***

To assist the Subcommittee on Education of the House Committee on Education and Labor in its consideration of legislative changes in the guaranteed student loan program, GAO was asked to present information developed during a review of the program authorized under the Higher Education Act of 1965. *Gregory Ahart*, deputy director, Civil Division, presented information at a hearing held on July 29, 1969. (Other participants: Messrs. *DeFazio* and *Blair*.)

### ***Justice Department Collection Policies***

At a hearing on September 9, 1969, before the Legal and Monetary Affairs Subcommittee of the House Government Operations Committee, Mr. Ahart reviewed the actions taken by the Department of Justice to implement recommendations made by the committee in 1964 concerning collection of money due the United States as a result of court actions. Mr. Ahart reported that additional action was needed and outlined recommendations that would improve the effectiveness of the collection

<sup>3</sup> B-159687, Sept. 18, 1969.

activities. (Other participants: Messrs. *Neuwirth* and *Glick*.)

**Silver Losses**

The views of GAO on two private bills (H.R. 1390 and H.R. 13148) to compensate certain silver dealers and users for losses allegedly sustained as result of actions of the Treasury Department in terminating silver sales programs were presented to Subcommittee No. 2 of the House Judiciary Committee on September 11, 1969. *Milton Socolar*, assistant to the general counsel, presented the statement and answered questions concerning the bills. (Other participants: Messrs. *Matters* and *Kane*.)

**Grant-In-Aid Programs**

The Subcommittee on Intergovernmental Relations of the Senate Committee on Government Operations invited GAO to testify on S. 2479, a bill to improve the financial management of Federal assistance programs; S. 2035, a bill to authorize consolidation of Federal assistance programs; and S. 60, a bill to create a catalog of Federal assistance programs. This hearing, held on September 17, 1969, afforded the Comptroller General the opportunity to brief the subcommittee on GAO's current activities relating to Federal assistance programs. (Other participants: Messrs. *Smith*, *Nelson*, *Moore*, and *Thompson*.)

**Commission on Government Procurement**

The Comptroller General was invited to present comments on S. 1707, a bill to establish a Commission on Govern-

ment Procurement, before the Senate Government Operations Committee on July 31, 1969. As in the statement before the House Committee on H.R. 474, the Comptroller General urged the subcommittee's favorable consideration of the measure. (Other participants: Messrs. *Keller*, *Welch*, *Bailey*, *Hammond*, and *Thompson*.)

**Nomination of Robert F. Keller**

On September 23, 1969, the Senate Committee on Government Operations held a hearing on the nomination of Mr. Keller to be Assistant Comptroller General of the United States, to succeed Frank H. Weitzel who retired at the end of his term on January 17, 1969. Following the hearing, the committee met in executive session and ordered favorably reported to the Senate Mr. Keller's nomination.

Also attending the hearing was the former Comptroller General, Joseph Campbell.

**GAO's Role in Defense Contracts**

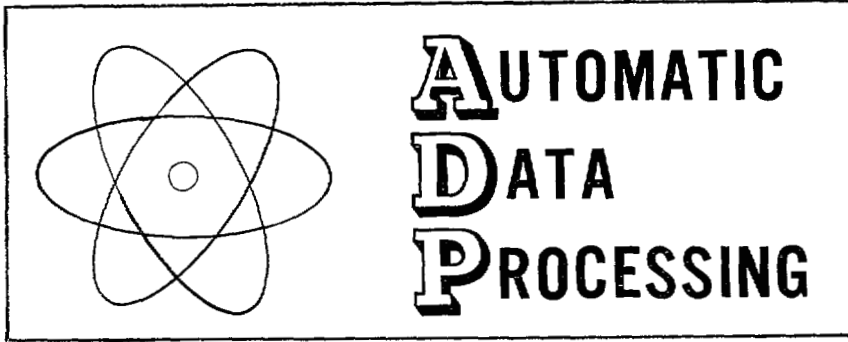
As a result of the numerous proposals for GAO to review and analyze specific defense contracts which developed during the Senate consideration of the military procurement authorization bill for 1970, the Subcommittee on Reorganization of the Senate Government Operations Committee, chaired by Senator Ribicoff, asked the Comptroller General to review GAO's role in this area. The hearing was held on September 16, 1969, at which time Mr. Staats furnished the subcommittee with a comprehensive review of GAO's mission. (Other participants: Messrs. *Keller*, *Powers*, *Morse*, and *Thompson*.)

**Compliment**

On March 6, 1969, *Allen R. Voss*, associate director, Civil Division, testified before the the House Committee on Public Works on GAO work in the area of water pollution control. He was accompanied by *Edward A. Densmore, Jr.*, and *John R. Tipton*, supervisory auditors, Civil Division, and *Smith Blair, Jr.*, legislative attorney. At the conclusion of the hearing, the chairman com-

plimented the GAO witnesses as follows:

We are very impressed with the accuracy and concisiveness and good judgment that you have shown in this whole probing effort. You have made a great contribution and I want to add my compliments to the GAO for having men of your caliber. And the kind of work you are doing is a great public service. We can really benefit from topnotch talent and dedication such as you people have presented here today. Thank you all very much.



### **Computer Auditing Training Session**

A 3-day training course on computer auditing techniques was conducted at the GAO Building in Washington, D.C., on July 22, 23, and 24, 1969. The course was conducted primarily for those regional office staff members designated to work full time in computer audit activities.

The following GAO staff members attended:

George M. Bissey, Kansas City  
Lawrence Davis, Jr., Norfolk  
Frank G. Farkas, Detroit  
Donald G. Franklin, OPSS  
Raymond W. Hillstrom, Chicago  
Don M. Howard, Atlanta  
Donald C. Ingram, Denver  
Geraldine F. Jasper, Washington  
Robert F. Langlinais, New Orleans  
Dale E. Ledman, Cincinnati  
David R. Miller, Detroit  
Warren G. Nogle, San Francisco  
William M. Reis, Boston  
Allan Sharfstein, New York  
Robert Van Maren, Kansas City  
Edward A. Waytel, Washington  
Daniel C. White, Dallas  
James G. Williams, Los Angeles  
Robert A. Wlodarek, Chicago

In addition, representatives from the Department of Agriculture, the De-

partment of the Air Force, the Naval Audit Service, and the Federal Deposit Insurance Corporation, attended part of the training session dealing with the Auditape.

*Joseph L. Boyd, Frank Gentile, Leonard J. Koczur, and Charles R. Shimkus*, all from the Office of Policy and Special Studies, conducted the sessions, which included training in the Haskins & Sells Auditape system and discussions of Alexander Grant & Co.'s *Audassist* system and the S. D. Leidesdorf & Co., approach to computer auditing.

### **Legal Information Retrieval System**

Bureau of the Budget Bulletin No. 70-4, dated August 29, 1969, announced that an automated system for searching legal sources and retrieving information, operated by the Air Force for the Department of Defense, is available for use by all Government agencies on a reimbursable basis. The bulletin provides general information about the system and instructions on obtaining the service.

The system is commonly referred to as LITE (Legal Information Thru Electronics). It uses a large-scale electronic computer to search the text of a *body of information (data base)* such as the United States Code or the pub-



lished decisions and unpublished decisions of the Comptroller General. The search is made according to predefined requirements of the user. In his search request, the user identifies certain words or phrases which the computer is to search for. The computer responds by printing out the total text of the section in which the words or phrases are found.

The LITE system is operational and, at the present time, is able to provide searching services for Federal agencies on statutory, decisional, and regulatory data base material.

Additional information about the system may be obtained from the Office of the Judge Advocate General, U.S. Air Force.

### ***Auditape Applications***

#### **Boston Regional Office**

The Boston Regional Office recently completed a successful Auditape application in a review of the propriety of salary rates at the Naval Supply Center (NSC), Newport, R. I. Although the Auditape was used for only a small segment of the audit, the auditors reported that its use resulted not only in a more economical way of doing the work but also provided greater accuracy and more information.

*W. F. Whitney Glynn* performed the payroll audit. *Ernest Eramo* and *William M. Reis* worked out the technical details for use of the Auditape. A summary of this application, prepared by Boston Regional Office staff members, follows.

#### ***Audit Approach***

The audit program followed was the standard "Civilian Pay Audit Program

for Use at Department of Defense Installations—Propriety of Salary Rate" and implementing instructions. The approach used in this application is outlined below.

1. The audit program was reviewed to determine what data would be required in establishing the propriety of salary rates of employees paid by the Naval Supply Center (NSC).
2. NSC's payroll and personnel systems and computer facilities were surveyed to determine (a) what data was available through the computer system and (b) if the technical characteristics of NSC's computer system were compatible with Auditape requirements.
3. A selection was made of NSC data files to be utilized and Auditape techniques were applied wherever feasible.

#### ***NSC Computer Facilities***

The NSC payroll is processed on an IBM 1410 system and off-line printing of payroll checks and fiscal and management reports are done on an IBM 1401 system. We determined that the IBM 1401 system had sufficient internal memory capacity and tape drives for use with Auditape. The computer system characteristics along with the field assignments were recorded on Auditape specification sheets. These sheets are used to prepare the specifications cards which are read into the computer with the Auditape instructions to complete the program for the routine to be processed.

*Audit Requirement and NSC Data Files*

The audit program specified that a random sample of 75 employees was to be selected from a current payroll and that the salary rates of these employees were to be reviewed for propriety for the 26 pay periods prior to the date of our visit (June 1969). The population from which the sample was to be selected would include employees currently on leave without pay but exclude employees who had separated within the 26 pay periods covered by our review.

We determined that NSC utilizes a payroll Master Employee Record (MER) tape to process its payrolls. The following information on this tape was pertinent to our review:

- Name
- Badge number
- Payroll group
- Activity
- Object class code
- Grade/level
- Step
- Annual rate
- Special rate
- Annuitant code
- Actual hourly rate

Accordingly, our approach was to select a sample from the current MER tape and, for the employees included in the sample, obtain a printout of the pertinent data from the current MER tape. With this data, the payroll auditor could manually examine the personnel records and supporting records to satisfy the payroll audit objectives relating to the propriety of salary rates.

The MER tape is a cumulative record

and thus it contains only the current status of employees. Events which occurred during the past year are not available. However, by comparing the status at the start of the year to the status at the end of the year, it would be possible to determine and identify pay changes during the year. This information would further facilitate the manual work to be performed by the payroll auditor. Unfortunately, NSC did not retain the MER tape applicable to the start of the year. A January 1969 and a December 1967 tape were available, however. Accordingly, as an experiment, we compared our selected sample with the data shown on the old tapes to aid the payroll auditor in determining what changes in pay rates had occurred.

Additionally, we found that NSC was developing a personnel master tape which contained information on 647 of the 4,900 employees paid by the installation. The following information on this tape was pertinent to our review:

- Name
- Type appointment currently held
- Social security number
- Date of last increment
- Date of next increment

To further aid the payroll auditor, we decided to experiment and extract the above information for any of the employees which were selected in our sample.

*Use of Auditape with Current MER Tape*

The following computer runs were made on NSC's IBM 1401 system, using the Auditape, the current MER tape,

and specification cards prepared by GAO staff members:

1. Create from the input tape a magnetic tape in Auditape format which contains all employees and the pertinent data to be used in our review. Also, subtotal the employees by pay group (classified and wage board); print out the total annual wage of classified employees; and, print a count of the input and output records. (Edit routine with subtotal subroutine.)
2. Using the output tape from Run No. 1 as input, select a random sample of employees for subsequent detailed review. Output from this run is a magnetic tape containing the selected data on employees included in the sample. (Audit sample routine.) NOTE: Our audit program specified that the sample size should be 75; therefore, knowing the population size, the precision limit and reliability factor were selected so the Auditape sample would equal 75.
3. Print out the data relating to the employees selected as our sample in Run No. 2.

#### *Use of Auditape with Old MER Tapes*

The following computer runs were made using NSC's old MER tapes (January 1969 and December 1967), in order to obtain data on employees included in the sample which could be used for comparison purposes with current data.

1. Create from the input tape a magnetic tape in Auditape format

which contains the pertinent data for the employees specified. Employees to be included are the 75 selected from the current MER tape and identified on the basis of badge number. (Edit routine with include subroutine.)

2. Print out the data obtained in Run No. 1.

#### *Use of Auditape with Personnel Master Tape*

The following computer runs were made using NSC's personnel master tape in order to obtain data on employees included in the sample. (The tape contained information on eight of the 75 employees included in the sample.)

1. Create from the input tape a magnetic tape in Auditape format containing the pertinent data specified. Employees to be included are the 75 selected from the current MER and identified on the basis of social security number. (Edit routine with include subroutine.)
2. Print out the data obtained in Run No. 1.

#### **Los Angeles Regional Office**

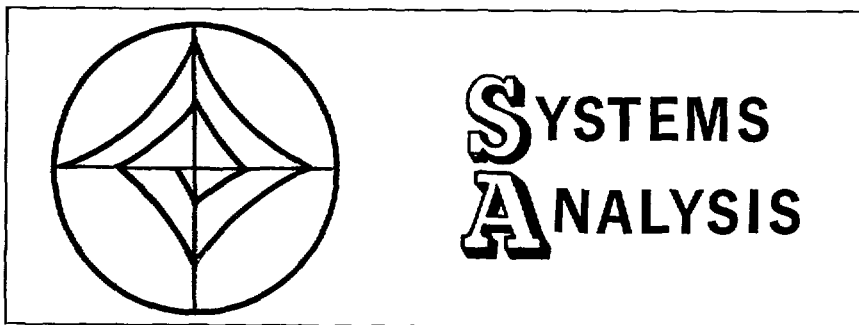
This office also successfully completed an Auditape application on a payroll audit. A unique feature of this application was the auditors' method of getting a sample printout when an on-line printer was not available for use.

*William J. McCormick, Jr., Joseph S. Minsky and James G. Williams* prepared the following summary of this application.

In accordance with the work program for the review of civilian pay at de-

fense installations (salary rate and time and attendance), 100 civilian employees at each of the selected installations were randomly selected for a detailed records review as required by the salary-rate segment of the audit. At the first selected installation, Long Beach Naval Shipyard (LBNS), we found that many of the detailed records pertinent to the review under the salary-rate segment were maintained on a UNIVAC III magnetic tape oriented computing system. The magnetic tape files could not be processed by the Auditape because the magnetic coding scheme used to record data onto the tapes was not compatible with the magnetic coding scheme required for tape input to Auditape. However, since the LBNS time and attendance punched cards were recorded in a coding scheme acceptable to the Auditape, we processed these cards as the Auditape input on an IBM 1410 magnetic tape oriented computing system at the Naval Supply Center (NSC), Long Beach, Calif.

We processed time and attendance punched cards representing a universe of 7,828 LBNS civilian employees that were considered to be within the scope of the review and, through the use of the Auditape audit sample design and selection routine, selected a sample of 104 civilian employees. Since the NSC computing system did not have an on-line printer, our sample was provided in the form of 104 punched cards by an on-line punch. Each of the 104 punched cards contained a sequence number, shop number, employee number, and employee name for each of the employees selected. These punched cards were subsequently used to provide the audit team conducting the review with a listing of the sample in employee surname order and a listing by employee number within shop number order. In addition, the punched cards containing the sample were submitted to LBNS for the purpose of assessing the detailed records pertinent to the review and maintained by the UNIVAC III computing system.



### ***Assessment of Methods of Public Choice***

The following remarks were delivered by *Keith E. Marvin*, associate director, Office of Policy and Special Studies, while participating as a panelist at the joint national meeting of the American Astronautical Society and the Operations Research Society of America in Denver, June 17, 1969:

The title of our panel—A Critical Assessment of Methods of Public Choice—implies that we can define these methods. In a broad long-term sense these methods include the actions of each individual citizen. In a working sense in which we are most interested, they include all levels and branches of government all of which are affected by elections, lobbies, and other aspects of our political system.

The question we are addressing boils down to what it is we all want, what alternative ways there are to get what we want, and what the costs are in dollars and in other terms for these alternatives, considering both quantitative and nonquantitative aspects and the political, economic, and social aspects. *This sounds a little like PPB.* If you don't like the term PPB, give it any name you choose. It appears to me that all systems of choice, including our household budgets, have these

essential aspects, although some are more formal processes than others.

The process I have just alluded to can also be regarded as a complex system of feedback loops starting from the measurements of what we have accomplished and what it has cost to the impact of this information on what it is we want to do. PPB may have had its greatest impact in helping to determine what it is we want to do. As for its impact directly on decisions in the shorter term, various surveys of PPB at the national level, including one conducted by GAO, have not found a direct link between PPB analyses and most of the specific decisions affecting the allocation of resources to specific programs.

One reason that PPB has impacted on the question of what we want to do is that it has stimulated analysis at many levels of government. Many of you are probably aware of efforts to apply PPB at State and local levels, of which the George Washington University State-Local Finance Project was an important early example.

An example of feedback from analysis of results to impact on what we want to do is the situation regarding national welfare. Our objective for about 30 years of paying income maintenance only to those who could

not work and only on the basis of proof of need has been questioned. OEO now has an experimental negative income tax project in New Jersey which has just been funded for another year. HEW is starting tests to study the results of paying welfare benefits based on the recipients' declaration of need. Experiments such as these represent realization that we may want to do things differently and these tests will provide the opportunity to measure the effects on motivation, family life, administrative costs, etc.

Assuming that we have decided what we want, we are still faced with the question of how to define the alternatives. The severity of some of our national problems is leading to the recognition and analysis of new alternatives. For example, studies by the Urban Land Institute in Milwaukee which were reported in *Nations Cities* for March 1969 show some innovative thinking regarding alternative solutions to our urban decay. The conclusion of this report is briefly that "No urban renewal subsidy should be needed at all if the property tax were shifted to land alone."

This study claims to show what could be expected if a city were to (1) stop collecting any property tax at all on improvements, (2) assess all of the land as if the owner were putting it to a use commensurate with its market price, whether he was or not, and (3) raise the tax rate on location values high enough to make up for the revenue loss from not taxing improvements. The need for subsidies for urban renewal would not only be eliminated according to this study, but the stimulant to new construction would create the opposite

problem of how to control a building boom that would create excessive demand for labor and financial resources. Therefore, the shift would need to be made in small doses over a period of perhaps 10 years.

The Urban Land Institute's solution is obviously strong medicine but such innovative suggestions, if followed by sound analysis, can create a more informed citizenry. It seems to me that we as a nation will accept stronger medicine if the disease is diagnosed as being serious enough. Better data and better dissemination of the data and resulting analysis can help in this diagnosis.

An example of better data is the recent report of the National Commission on Urban Problems, commonly known as the Douglas Report. This report represents a major advance in the knowledge which we have about our success in meeting the housing needs of the Nation. Just one paragraph from this report illustrates the point:

There are today at the very least 11 million substandard and overcrowded dwelling units in the United States. This is 16 percent of the total housing inventory. According to the census, three-fifths of all that substandard housing is said to be in rural areas—generally on farms and in towns of less than 2,500 persons. Thirty-six percent of all rural housing is substandard, compared with estimates of 10 percent of all urban housing. These are highly conservative figures. And they not only greatly understate the problem but tend to mask the critical aspect of the urban housing problem—the concentration of substandard housing and of poor people.

Another example of improved analysis in recent years is the controversial "Coleman Report" which reports on what is probably the most extensive analysis to date of the Nation's educa-

tional systems, particularly of efforts to improve the education of the disadvantaged. A number of authorities contend that this report demonstrates that there is no significant evidence that current school practices have important impacts on student learning. This interpretation is disputed but the significant thing is that the report has stimulated more innovative thinking and analysis and has caused approaches which were considered innovative 2 or 3 years ago to be questioned.

It is through this measurement, analysis, and feedback process that we determine new alternatives and make new decisions about what it is we want to do. These new alternatives still need to be tested and evaluated. It appears that we as a nation are rapidly accepting the concept that this testing and evaluation needs to be done at various levels of government; not all at a local level and not all in Washington. It also needs to be done by both the executive and legislative functions. This trend will not deprive any group of its job but will rather stimulate more realistic, valid, and useful evaluations for use in the process of public choice.

### ***BOB Policy on Discount Rates***

The Bureau of the Budget prescribed on June 26, 1969, in its Circular No. A-94 (effective July 1, 1969), standard discount rates to be used by executive agencies in evaluating the costs, benefits, or outputs of programs or projects when the costs, benefits, or outputs occur over time. Issuance of this policy statement marks the first time that the executive branch has explicitly formulated a discounting policy applicable to

all agencies and programs for other than the situations covered by Circular No. A-76 on policies for acquiring commercial or industrial products and services and Senate Document No. 97 which sets forth policies for evaluating water resources projects. Circular No. A-94 is applicable to internal planning documents of agencies and to program analyses submitted to the Bureau, but it does not supersede the policies stated by Circular No. A-76, legal requirements, and Presidential directives.

The present-value approach for evaluating costs and benefits of programs or projects is advocated and a discount rate not lower than the discount rate established by the Water Resources Council in December 1968 is prescribed. For fiscal year 1970 this rate is  $4\frac{7}{8}$  percent. The Bureau will request use of a higher rate for particular evaluations. It is currently making a study of the interest rate representing opportunities foregone in the private sector, and the results of the study will be the basis for any changes in the discount rate policy.

The issuance of policy guidance by the Bureau of the Budget on discounting was recommended by the Subcommittee on Economy in Government of the Joint Economic Committee in its report of September 1968 on "Economic Analysis of Public Investment Decisions: Interest Rate Policy and Discounting Analysis." The subcommittee's report was based on hearings held in 1968 which included testimony on the GAO report of January 29, 1968 (B-162719), entitled "Survey of Use By Federal Agencies of the Discounting Technique in Evaluating Future Programs."

**Progress in Implementing PPB**

In recent months, several important documents related to planning, programming, and budgeting (PPB) have been published. One of these is the GAO report to the Congress dated July 29, 1969, entitled "Survey of Progress in Implementing the Planning-Programming-Budgeting System in Executive Agencies" (B-114398). This report, most of which was printed in the *Congressional Record* of August 5, 1969, at the request of Senator Proxmire, discusses progress made in implementing PPB since it was formally introduced by President Johnson in August 1965, and some of the problems being encountered.

Although 20 of the 21 agencies that had been directed by the Bureau of the Budget to adopt a PPB system had done so at the time the GAO survey was undertaken, there were differences among the program classification systems of the agencies and the report comments on some obstacles to the creation of a Government-wide PPB program structure. Also noted was that communications between accounting staffs and PPB staffs has not been extensive and that agencies did not have extensive written policies to guide analysts in the preparation of documents and studies.

At the time of the survey 1,594 employees in agencies had been assigned full-time PPB responsibilities, and there were other employees spending part of their time on PPB matters who were equivalent to about 880 full-time employees.

Included in the GAO report are appendices showing (1) the relationship

between program and organizational structures of 17 departments and agencies, (2) the PPB program structure for Federal aid to the poor, and (3) GAO comments on selected analyses made by the Department of Defense; the Department of Housing and Urban Development; the Department of Health, Education, and Welfare; and the Department of Transportation.

Another document related to PPB is a three-volume publication of the Subcommittee on Economy in Government of the Joint Economic Committee entitled "The Analysis and Evaluation of Public Expenditures: The PPB System." This May 1969 publication contains 50 background papers on a variety of topics by economists and analysts. Among the broad topics discussed are: (1) analysis and evaluation in major policy areas, (2) the performance of program budgeting and analysis in the Federal Government, (3) institutional factors affecting efficient public expenditure analysis, and (4) the appropriate functions of Government in an enterprise system.

One of the overall objectives of publishing these papers was to focus the attention of the Congress and the new Administration on the need for quantitative benefit-cost-type analysis in the formation of Federal expenditure decisions. A second objective was to stimulate economists and other social scientists to undertake the efforts necessary to increase the efficacy of economic analysis in public sector decisions.

A final objective of special interest to GAO was to assist those in Government whose job it is to do program planning and policy analysis by providing both



conceptual and methodological guidance for those analyzing the social worth of public alternatives. The papers reflect the judgment that the implementation of public expenditure policy can be more effective if guided by the results of sound and quantitative economic analysis of available options (in other words, systems analysis).

A third document related to the prog-

ress of PPB is a record of 2 days of hearings (May 12 and 14, 1969) before the Subcommittee on Economy in Government entitled "Guidelines for Estimating the Benefits of Government Expenditures." One of the witnesses on May 12, 1969, was the Comptroller General, *Elmer B. Staats*, whose statement was published in the Summer 1969 issue of the *GAO Review*.

## GAO Staff Changes



**Joseph L. Boyd**

Joseph L. Boyd was designated an assistant director for automatic data processing in the Office of Policy and Special Studies, effective July 27, 1969.

Mr. Boyd served in the U.S. Navy from 1945 to 1949 and in 1953 graduated from the University of Maryland where he was elected to membership in Beta Alpha Psi, national honorary accounting fraternity. He joined the Kansas City Regional Office staff in 1953 after working for the public accounting firm of Haskins & Sells.

He attended the Program for Management Development at the Harvard University Graduate School of Business Administration in 1964. He is a member of the Federal Government Accountants Association and has served as vice president of the Oklahoma City Chapter.



**Thomas R. Brogan**

Thomas R. Brogan of the International Division was named manager of the Saigon suboffice, Far East Branch, effective August 1, 1969.

Mr. Brogan, who has been attached to the Honolulu office of the Far East Branch, is a graduate of Pennsylvania State University and has been associated with the General Accounting Office since 1957. Prior to his assignment in Honolulu, he had served in Washington and Tokyo.



**Nicholas Carbone**

Nicholas Carbone was designated as assistant regional manager of the Boston Regional Office, effective July 27, 1969.

Mr. Carbone served in the Army from 1946 to 1947 and in 1952 graduated from Boston College with a bachelor of science degree, majoring in accounting. He is a CPA (Massachusetts) and a member of the American Institute of Certified Public Accountants and the Federal Government Accountants Association.

With the exception of an overseas tour in Frankfurt from 1962 to 1965, Mr. Carbone has been with the Boston Regional Office since joining GAO in 1952.



**Mortimer A. Dittenhofer**

Mortimer A. Dittenhofer joined the General Accounting Office on July 13, 1969, as an assistant director in the Office of Policy and Special Studies. In this position he will be responsible for special projects pertaining to Federal-State-local governmental relations in which the GAO is involved.

Mr. Dittenhofer comes from the Department of Health, Education, and Welfare where he had been Director of the Division of Accounting Systems. From 1963 to 1968, he was with the National Aeronautics and Space Administration and served there as Assistant Director of Financial Management. Previously, from 1954 to 1963, he was an auditor and field audit supervisor for the Atomic Energy Commission.

Before entering Government service, Mr. Dittenhofer had been comptroller for two firms in Chicago, Commercial Discount Corp., an industrial financing organization, and Lucien Lelong Inc., a manufacturer of cosmetics. He holds a B.A. degree from Macalester College in St. Paul, Minn., and an M.B.A. from Northwestern University. He is currently in the doctoral program at American University and has recently gone into the Retired Reserve as an Army Finance Corps Colonel.



**Frank Gentile**

Frank Gentile was designated as assistant director for statistical projects in the Office of Policy and Special Studies, effective July 27, 1969.

Mr. Gentile received a bachelor of business administration degree from the City College of New York in 1940 and completed 1 year of graduate work at Denver University night school in 1947.

He served in the U.S. Army Air Corps from 1941 to 1946. Prior to Government service, Mr. Gentile was employed by the Cowles Publishing Co. at Spokane, Wash., as their statistical research supervisor. From 1960 to 1967, when he came to the GAO, he was a survey statistician in the Bureau of Labor Statistics of the U.S. Department of Labor.



**Fred D. Layton**

Fred D. Layton was designated as an assistant director in the Civil Division, effective July 27, 1969. He is currently responsible for directing the GAO review and consultative work relating to the accounting and financial management systems of the Department of Agriculture.

Mr. Layton received his bachelor of arts degree in accounting from East Carolina University in 1960. He is a CPA (Virginia) and a member of the National Association of Accountants and the Federal Government Accountants Association. He received the GAO Career Development Award in 1967. Mr. Layton is currently pursuing a masters degree in business administration at the George Washington University.



**Daniel P. Leary**

Daniel P. Leary was designated as an assistant director in the Civil Division, effective July 27, 1969. In this position he will be responsible for the General Accounting Office accounting, auditing, and investigative work at the Federal Supply Service of the General Services Administration.

Mr. Leary served in the U.S. Army from 1953 to 1955. He received a bachelor of science degree from LaSalle College in 1969 and a master's degree in business administration from American University in 1962. He also attended the Program for Management Development at the Harvard University Graduate School of Business Administration. He is a CPA (Maryland) and a member of the American Institute of CPAs and the National Association of Accountants.





**Harry J. Mason, Jr.**

Harry J. Mason, Jr., was designated as assistant director for automatic data processing policy in the Office of Policy and Special Studies, effective July 27, 1969.

Mr. Mason served in the U.S. Army Air Corps from 1943 to 1945. He received a bachelor of science degree in accounting from LaSalle College in 1949 and has done graduate work in automatic data processing at American University.

Mr. Mason joined the General Accounting Office in 1953 and was assigned to the Philadelphia Regional Office until 1962 when he transferred to the Office of Policy and Special Studies. Mr. Mason's service in the General Accounting Office has been primarily with accounting and auditing activities as they relate to management information systems which employ automatic data processing methods and techniques.

Mr. Mason is a charter member of the Society for Management Information Systems.



**William E. Parker**

William E. Parker was designated assistant director for management information systems, Program Planning Staff, Office of the Comptroller General, effective July 27, 1969. In this capacity, he will be concerned with planning and directing the management information systems work of the staff.

Mr. Parker joined the Civil Division of GAO in 1957 and has been with the Program Planning Staff since 1967. He graduated with distinction from Hofstra University in 1957 and served in the U.S. Army during World War II and the Korean war. He is a member of the American Management Association and the Association for Computing Machinery.



**James K. Spencer**

James K. Spencer was designated as an assistant director in the Civil Division, effective July 27, 1969. In this position he will be responsible for the General Accounting Office accounting, auditing, and investigative work at the Property Management and Disposal Service and the Transportation and Communications Service of the General Services Administration.

Mr. Spencer received a bachelor of science degree in accounting from the University of North Carolina in 1957. He joined the General Accounting Office in 1959 and received a Meritorious Service Award in 1961. Mr. Spencer is a member of the Washington Chapter of the National Association of Accountants.

## Professional Activities

### ***Office of the Comptroller General***

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

Committee on Government Relations of the National Association of College and University Business Officers in San Francisco, on "Federal Support for Research and Education: Costs and Benefits," July 11. Mr. Staats' address is printed in this issue of the *Review*.

Budget Analysts Institute, Institute of Government, University of North Carolina and National Association of State Budget Officers, in Chapel Hill, N.C., on "The Relationship of Budgeting, Program Planning, and Evaluation," August 20.

Bureau of the Budget's Belmont Conference of Agency Program Planning and Evaluation Officers on improving the Planning-Programming-Budgeting System. Mr. Staats spoke on "Congressional Needs for Improving PPB," September 8.

Dallas Chapter of the Federal Government Accountants Association on "Recent Developments in the Work of the General Accounting Office," September 10.

Southwestern Legal Foundation's Ninth Annual Institute on Government Contracts, Dallas, Tex., on "Is It Feasible to Apply Uniform Cost Accounting Principles and Standards in Government Contracts?" September 11.

Brookings Institution's Conference for Business Executives on Federal Government Operations, on the role of the GAO, September 15.

### ***Office of the General Counsel***

*Robert F. Keller*, general counsel:

Addressed the National Contract Management Association, Dayton, Ohio, on "GAO Review of Contract Appeal Board Decisions—The Attorney General's Opinion in the Southside Plumbing Case—A Development in the Court of Claims," June 19.

Attended the American Bar Association Convention, Public Contract Law Section, Dallas, Tex., and spoke on "The Attorney General's Opinion in the Southside Plumbing Case," August 11 and 12.

*J. Edward Welch*, deputy general counsel:

Spoke before the Texas Chapter, Associated General Contractors, Las Vegas, Nev., on the "Davis-Bacon Act," and on the "Philadelphia Plan," August 8.

*Stephen P. Haycock*, assistant general counsel:

Addressed the Contract Management Institute, Washington, D.C., July 1, on "Public Law 87-643—Truth in Negotiations."

Spoke before the Procurement Law Course, Judge Advocate General's School, Charlottesville, Va., on

“GAO’s Role in Government Contracting,” August 28.

*Paul Shnitzer*, deputy assistant general counsel:

Participated as a panelist on Government Contracting and Subcontracting Techniques presented by the California Institute of Technology and Federal Publications, Inc., at Los Angeles, Calif., July 20 and 24.

*Robert H. Rumizen*, deputy assistant general counsel:

Spoke before the Defense Advanced Procurement Management Course, Fort Lee, Va., on “Problems in Formal Advertising,” August 11.

*Charles J. Goguen*, deputy assistant general counsel:

Attended a course on “Management of Organizations,” Civil Service Executive Seminar, Kings Point, N.Y., August 4–15.

*Seymour Efros*, attorney-adviser (contract):

Participated in a panel discussion before the Northern New Jersey Chapter of FGAA on “Defective Pricing,” East Orange, N.J., June 19.

**Office of Policy and Special Studies**

*The Federal Accountant* for September 1969 includes a paper on “The Planning-Programming-Budgeting System and the Congress” by *E. H. Morse, Jr.*, director. This paper was presented at the XVIth International Meeting of The Institute of Management Services, New York City, March 27.

*Keith E. Marvin*, associate director,

participated on July 17 in a panel discussion on PPB and program evaluation at the meeting comprised of the past year’s speakers before the monthly luncheon meetings of the American Society for Public Administration Comprehensive Program Planning Study Group, Washington, D.C.

On September 3, Mr. Marvin led a discussion based on the GAO report “Progress in Implementing the Planning-Programming-Budgeting System in Executive Agencies” at a meeting of the 1968–69 participants in the educational program in systems analysis sponsored by the National Institute of Public Affairs.

*Robert G. Meisner* has been appointed a member of the News Bulletin Committee of the Washington Chapter of the FGAA.

*William L. Campfield*, assistant director, is serving in the following capacities with professional organizations for fiscal year 1970:

*American Institute of Certified Public Accountants*

Member of Committee on Educational Policy

Contributing Editor for Education and Training Section of *The Journal of Accountancy*

*American Accounting Association*

Member of Committee on Accounting Practices of Not-For-Profit Organizations

Member of Committee on Socio-Economic Accounting

Liaison between the AAA and the AICPA Committees on Professional Opportunities for Minority Groups

## PROFESSIONAL ACTIVITIES

### *Federal Government Accountants Association*

Secretary of Washington Chapter  
Member of the National Committee  
on Cooperation with Other Profes-  
sional Organizations

Mr. Campfield has had articles published recently as follows:

*The U.S. Army Audit Agency Bulletin*—"Persuasive Communication to Management," Summer 1969.

*The Business and Government Review*, University of Missouri, Columbia, "Administration of Grants—Is the Federalist Partnership Synergistic or Symbiotic?" July/August 1969.

*Susumu Uyeda*, assistant director, is serving as a member of the National Membership Committee and the National Education Committee of the FGAA. He is also a member of the Washington Chapter Committee on Cooperation with other Government agencies.

### **Civil Division**

*Randall D. Conley*, supervisory auditor, was presented with the National Association of Accountants, Washington Chapter, Team Captain of the Year Award on September 17.

*William M. Edmondson*, supervisory auditor, received an M.B.A. degree in international business from George Washington University on September 30.

*Morton E. Henig*, assistant director, spoke at the Summer Institute in Public Administration at the Goddard Space Flight Center on July 8. The sub-

ject of his address was "Constraints in Public Bureaucracies."

*Philip A. Bernstein*, supervisory auditor, attended the Concentrated Course in Government Contracts at the California Institute of Technology on July 21–25.

*John E. Endlich*, supervisory auditor, attended a seminar on the Effects of Technological Development conducted by the Civil Service Commission on September 8–19, in Kings Point, N.Y.

*Jack L. Mertz*, special assistant to the director, was presented, on September 17, the Team Member of the Year Award by the Washington Chapter of the National Association of Accountants for the 1968–69 year. Mr. Mertz was also the recipient of this award for the 1966–67 year.

*Edward A. Densmore, Jr.*, spoke before a group of political science students from American University on September 23. He discussed the functions of GAO and its audit of the Federal Water Pollution Control Administration.

### **Defense Division**

*Charles M. Bailey*, director, addressed the Professional Military Comptroller Course, Air University, Maxwell Air Force Base, Ala., on July 14 on the subject of "DOD/GAO Relationships." He discussed current Defense Division activities with emphasis on those relating to Air Force operations.

*Daniel Borth*, associate director, is a member of the National Publications Policy Committee of the Federal Government Accountants Association for fiscal year 1970.

*Marvin Colbs*, assistant director, was awarded the degree of Master of Science in international affairs by George Washington University on September 30, 1969.

*Matthew Gradet*, assistant director, has been selected to serve on the Membership Promotion Committee of the American Institute of Certified Public Accountants for the 1969-70 fiscal year.

*Sam Pines*, assistant director, has been appointed chairman of the News Bulletin Committee of the Washington Chapter of the FGAA.

### **Field Operations Division**

*Frederick R. Cross, Jr.*, and *Thorn-ton L. Harvey*, supervisory auditors, Boston, have been elected treasurer and director of membership, respectively, of the Boston Chapter of FGAA for fiscal year 1970.

On August 26, *David C. Hoffman*, supervisory auditor, Chicago, spoke at a meeting of the Kiwanis Club of Elmhurst, Ill. The subject of his talk was "The Role of GAO in the Federal Government."

*David P. Sorando*, regional manager, and *W. A. Broadus, Jr.*, supervisory auditor, Cincinnati, have been appointed to serve on the Arrangements Committee of the Cincinnati Federal Business Association for fiscal year 1970.

*Walter C. Herrmann, Jr.*, audit manager, and *Donald L. Allgyer*, supervisory auditor, Cincinnati, have been appointed to the Governmental Relations Committee of the Cincinnati Chapter of the Ohio Society of CPAs. Also Mr. Broadus was appointed to the

society's Committee on Management Services.

On July 23, *Walton H. Sheley, Jr.*, regional manager, Dallas, addressed "The Federal Budget Process," a Civil Service Commission sponsored training program. His topic was "The Role of the General Accounting Office in the Budget Process."

An article by *James A. Reardon*, audit manager, Denver, was published in the Summer 1969 issue of the "Colorado CPA Report." The title of the article was "The Colorado Society—Planning for New Vitality."

*George Doyle*, audit manager, Denver, has been reappointed to the United Fund Committee of the Colorado Society of CPAs.

*John A. Dowell*, assistant regional manager, Detroit, was appointed to the Advisory Committee on Professional Education of the Michigan Association of CPAs for fiscal year 1970.

In July 1969, *Hyman L. Krieger*, regional manager, Los Angeles, was appointed chairman of the Intergovernmental Relations Committee of the Federal Executive Board. He has been an active member of this committee for the past 2 years.

*William J. McCormick, Jr.*, supervisory auditor, Los Angeles, was elected treasurer and also selected as the "Outstanding New Member for 1969" in the East Whittier Junior Chamber of Commerce.

*Garry W. Martin*, supervisory auditor, and *Sam Mattes*, management auditor, Los Angeles, spoke about the functions of GAO before the Economics Club of the California State College at Los Angeles in June 1969. Also, Mr.

## PROFESSIONAL ACTIVITIES

Mattes was initiated on May 17 into Omicron Delta Epsilon, an honor society in economics.

*Walter H. Henson*, regional manager, and *Edward R. Root*, auditor, New Orleans, have been elected director and secretary, respectively, of the New Orleans Chapter of FGAA for fiscal year 1970.

*Werner Grosshans*, assistant regional manager, San Francisco, has completed his year of study at the Industrial College of the Armed Forces and in conjunction with this study obtained a master of science degree in business administration from George Washington University.

*Charles Vincent*, assistant regional manager, San Francisco, addressed two recent sessions at the CSC Executive Seminar Center in Berkeley. His topic was "Auditing Philosophies of GAO."

*L. Neil Rutherford*, audit manager, Seattle, addressed the Northwest area conference of the Administrative Management Society on June 12. The subject of his address was "A Conceptual Framework for Evaluating Management Performance."

### **International Division**

Two representatives of the Far East Branch were elected officers of the

Honolulu Chapter of FGAA for fiscal year 1970. *Clifford I. Gould*, assistant director, was elected president; and *Harold E. Lewis* was elected a director.

### **Transportation Division**

*T. E. Sullivan*, director, accompanied by *Jesse R. Nicholson, Jr.*, traffic management specialist, addressed the American Society of Military Comptrollers and the Federal Government Accountants Association in Anchorage, Alaska, on August 19, on the involvement of GAO in the transportation field.

Mr. Sullivan and *R. E. West*, assistant director, attended the meeting of the Freight Revenue Committee of the Accounting Division of the Association of American Railroads, in Jacksonville, Fla., on September 29 and 30. They discussed numerous problems of mutual concern in the audit of accounts and the settlement of rail carriers' claims against the Government.

*E. B. Eberhart* attended the semi-annual meetings of the Cargo and Passenger Revenue Accounting Committees of the Airline Finance and Accounting Conference in Miami, Fla., September 15 to 17. He discussed various billing problems encountered by the carriers on Government traffic.



## Successful Candidates—May 1969 CPA Examination

Listed below are the employees who passed the May 1969 CPA examination:

### REGIONAL OFFICE

<i>Name</i>	<i>Regional Office</i>	<i>State</i>
Harry E. Benchoff, Jr.....	Philadelphia .....	Pennsylvania.
Norman Bluestein.....	Philadelphia .....	Pennsylvania.
Morey J. Chick.....	Philadelphia .....	Pennsylvania.
Michael Cicoria.....	Boston .....	Massachusetts.
Robert W. Cook.....	Kansas City.....	Oklahoma.
Clifford L. Gardner.....	Seattle .....	Washington.
Richard G. Halter.....	Philadelphia .....	Pennsylvania.
Michael D. Herrick.....	Cincinnati .....	Ohio.
Eugene Horwitz.....	Los Angeles.....	California.
Sammy L. Hughes.....	Dallas .....	Texas.
Jacob Kaufman.....	New York.....	New York.
Nikey L. Kelley.....	Kansas City.....	Oklahoma.
Oliver W. Krueger.....	Detroit .....	Michigan.
Ruth A. Lee.....	Seattle .....	Oregon.
John P. Lydick.....	Seattle .....	Oregon.
James J. Murphy.....	Seattle .....	Washington.
Donald W. O'Bryan.....	Philadelphia .....	Pennsylvania.
Everett O. Pace.....	Norfolk .....	Virginia.
Larry J. Peters.....	Seattle .....	Oregon.
Joseph Piombino.....	Chicago .....	Illinois.
Robert Ramage.....	Philadelphia .....	Pennsylvania.
Francis L. Reynolds.....	Detroit .....	Michigan.
James S. Rodgers.....	Philadelphia .....	Pennsylvania.
Donald R. Schmidt.....	Detroit .....	Michigan.
Joseph P. Shull.....	Los Angeles.....	California.
Robert C. Summers.....	Philadelphia .....	Pennsylvania.
Forrest D. Thompson.....	Detroit .....	Ohio.
Harold Tinney.....	Boston .....	Massachusetts.
Leo B. Tripple.....	Los Angeles.....	California.
Stephen Verbick.....	San Francisco.....	California.
Donald A. Warda.....	Detroit .....	Michigan.
Nicholas White.....	Boston .....	Massachusetts.

SUCCESSFUL CPA CANDIDATES

WASHINGTON

<i>Name</i>	<i>Division</i>	<i>State</i>
John N. Balakos.....	Civil .....	West Virginia.
Stephen R. Beauch.....	Civil .....	Virginia.
L. Paul Blackmer, Jr.....	Civil .....	Virginia.
James S. Burgess.....	Civil .....	Maryland.
Ben B. Cox.....	Civil .....	Virginia.
Frank E. DeLillo.....	Civil .....	California.
Andrew N. Killgore.....	Civil .....	Virginia.
Thomas P. McCormick, Jr..	Civil .....	Virginia.
Sam A. Madonia.....	Civil .....	Pennsylvania.
Kenneth A. Mann.....	Defense .....	D.C.
Maurice S. Moody.....	Civil .....	Virginia.

## New Staff Members

The following new professional staff members reported for work during the period June 16, 1969, through September 15, 1969.

<b>Civil Division</b>	Allen, Edwin S., Jr.	Virginia Polytechnic Institute
	Berra, Harold B., Jr.	Pennsylvania State College
	Blackmer, Leslie P., Jr.	Benjamin Franklin University
	Boothe, Ronal B.	Glenville State College
	Breland, Carlus W.	Benjamin Franklin University
	Burgess, James S.	Benjamin Franklin University
	Campanella, Joseph A., Jr.	West Liberty State College
	Caradine, Richard W.	Bethany College
	Carrier, Judith L. (Miss)	Radford College
	Case, Marvin F.	University of Oregon
	Cordyack, John E., Jr.	Western Maryland College
	Covaleski, John J.	University of Scranton
	Dean, Helen M. (Miss)	Virginia State College
	Dutch, Alethea J. (Mrs.)	Howard University
	Ellis, Leonard W.	Muhlenberg College
	Fleming, Michael J.	Ursinus College
	Gardner, Diane E. (Miss)	Howard University
	Gieck, William L.	Southern Colorado State College
	Grishkat, Paul T.	Bethany College
	Hatcher, James E.	Concord College
	Jeffers, Ross E.	West Liberty State College
	Johnson, Thomas E.	Elizabethtown College
	Klein, Michael J.	Wilkes College
	Klotz, John J.	Central State College
	Lanier, William H.	Pembroke State College
	Loschiamo, James F.	Methodist College
	Lusk, Lacy T.	Bluefield State College
	Lynn, Peter R.	Lycoming College
	McFarland, Larry R.	Columbia Union College
	McGurl, Maureen K. (Miss)	Marywood College
	McKown, Nelson R.	Glenville State College
	Madison, Edward A.	West Virginia State College
	Mantz, Ramon A.	Kutztown State College
	Michewicz, Chester F.	University of Connecticut
	Miller, Charles J.	Moravian College
	Miller, David L.	Point Park Junior College
	Miller, Gerald R.	West Liberty State College
	Moore, Patricia D. (Miss)	Davis & Elkins College
	New, James H., II	West Liberty State College
	Ommert, George E.	Shippensburg College
	Pasden, Andrew J., Jr.	West Liberty State College
	Perer, Arlene N. (Miss)	University of Pittsburgh
	Peterson, Nancy C. (Miss)	Lycoming College
	Picyk, Elsie M. (Mrs.)	Pfeiffer College
	Pittsley, George W.	American International College
	Points, Ronald J.	Shippensburg College

NEW STAFF MEMBERS

<b>Civil Division—Con.</b>	Purdy, Jerrilynne (Miss)	Michigan State University
	Ramsey, Garry R.	Glenville State College
	Reifsnnyder, James R.	Lock Haven State College
	Reilly, Edward J.	University of Buffalo
	Reynolds, Paul R.	Gettysburg College
	Richards, Thomas M.	Wilkes College
	Seibert, Joel E.	Juniata College
	Silvestri, Albert J.	University of Scranton
	Sprott, Joseph G.	Methodist College
	Stanley, Darrell W.	Concord College
	Stevens, Joyce M. (Mrs.)	Bluefield State College
	Trenchard, William H., Jr.	Tusculum College
	Warren, Ernest W.	Pembroke State College
	<b>Defense Division</b>	Adams, Lloyd L.
Bogar, Carl F.		Small Business Administration
Brady, Rosemary J. (Miss)		St. Bonaventure University
Brown, Johnny B.		Arkansas A. & M. College
Crotty, John F.		Department of the Air Force
Curran, William E.		U.S. Air Force
Daugherty, George G.		Pennsylvania State University
DeVore, Richard H.		Oklahoma City University
DiCroce, Robert A.		Pennsylvania State University
Dowdal, Thomas G.		University of Minnesota
Dunne, Raymond G.		University of Delaware
Galloway, Byron S.		Eastern Tennessee State University
Hall, Richard A.		Husson College
Holler, John J., Jr.		King College
Hoover, John M.		University of Kansas
Jenkins, Woodliff L., Jr.		University of Richmond
Johnson, Bernadette E. (Mrs.)		Southern University
Johnson, Conroy B.		Department of the Air Force
Kans, Jeffrey A.		Milligan College
Kirkwood, Marilyn D. (Miss)		Columbia Union College
Knouse, Kenneth R., Jr.		Salem College
Kopelson, Laura A. (Miss)		Case Western Reserve University
LaMore, Richard C.		Northeastern University
Larkins, James R., Jr.		Tennessee Technological University
Linhart, Edward W.		Pennsylvania State University
Magliocchetti, Paul J.		West Liberty State College
Marks, Gerard J.		Department of Transportation
Millikin, Raymond W., Jr.		Appalachian State University
Moseman, Linda C. (Mrs.)		Madison College
Ohl, James L.		Lake Superior State College
Pagnillo, George A.		Belknap College
Plonka, Jess J.		Pennsylvania State University
Ratway, Joseph C.		Central State College
Sexton, Jennie L. (Miss)		East Tennessee State University
Tansey, Kevin M.	University of Minnesota	
Teilhet, Albert D.	Pennsylvania State University	
Thompson, Gerald J.	King's College	
Tuchman, Michael P.	University of Texas at El Paso	
Wenstrup, John J.	Wheeling College	

NEW STAFF MEMBERS

<b><i>International Division— Washington</i></b>	Abts, James D. Fuerstenberg, Judith A. (Miss)	U.S. Army Ernst & Ernst
<b><i>Far East Branch</i></b>	Morvillo, Richard	Department of the Army
<b><i>Office of Policy and Special Studies</i></b>	Dittenhofer, Mortimer A.	Department of Health, Education, and Welfare
<b><i>Transportation</i></b>	Kunkle, Gary W. Pearce, Stephen W. Pollon, Hugh G. Schmitz, Michael T.	Thiel College Louisiana Polytechnic Institute Alderson-Broadbudd College Marquette University
<b><i>Office of the Comptroller General</i></b>	Johnson, Daniel L.	Small Business Administration
 <b>REGIONAL OFFICES</b>		
<b><i>Atlanta</i></b>	Andrews, Gary W. Beard, James H. Flowers, Jesse J. Fowler, David W. Gamble, Margaret J. (Miss) Grant, John L. Morgan, John M. Swift, Richard H. Tamborella, Ronald L.  Thrasher, John G.	Southern State College Delta State College Troy State University Western Carolina University University of Southern Mississippi Troy State University Old Dominion College Austin Peay State University Louisiana State University in New Orleans Kentucky Wesleyan College
<b><i>Boston</i></b>	Bracci, Stephen P. French, Caryl S. (Miss) Kenyon, Robert H.  Moran, Richard T. Poirier, Roland A., Jr.  Rocheleau, Leona (Miss)	Merrimack College Northeastern University Southeastern Massachusetts Techno- logical Institute University of New Hampshire Southeastern Massachusetts Techno- logical Institute Southeastern Massachusetts Techno- logical Institute
<b><i>Chicago</i></b>	Doerning, Patrick B. Forst, Frank G. Gandrud, David L. Schmidt, Richard K. Stephenson, Edward H., Jr. Stone, Daniel R. Tangborn, Douglas A. Zilius, Vincent	Iowa State University Loyola University Bemidji State College Tri-State College Purdue University University of Nebraska at Omaha Bemidji State College Roosevelt University

NEW STAFF MEMBERS

<b><i>Cincinnati</i></b>	Braun, Edward E. Carrington, Homer N. Hammons, John S. Hawes, Edward D. Kennedy, Mitchell L. Moberly, John R. Ross, Roy E., Jr. Scott, Edward M. Shideler, Robert W. Willis, Carl R.	University of Evansville Murray State University Union College Marietta College Eastern Kentucky University Eastern Kentucky University Union College U.S. Atomic Energy Commission Indiana University Marshall University
<b><i>Dallas</i></b>	Occhipinti, Raimondo	Louisiana State University
<b><i>Denver</i></b>	Boutsen, Sandra M. (Miss) Brinton, William W. Hopkins, Gay H. Jensen, David S. Nehring, Donald D. Onstead, Clare E. Rogers, David A. Sas, Walter J. Wyant, Gary L.	Montana State University Utah State University University of Arkansas University of Utah University of North Dakota College of Great Falls University of Wyoming University of Denver Morningside College
<b><i>Detroit</i></b>	Bigler, Joan A. (Miss) Gervason, Robert J. Hosler, Michael T. Livingston, Joseph J. Rice, Carol E. (Miss) Shook, William M., Jr. Sohayda, James T. Tucker, Linda M. (Mrs.)	Bowling Green State University Wayne State University Findlay College University of Wyoming Ohio Wesleyan University Michigan State University Youngstown State University Marygrove College
<b><i>Kansas City</i></b>	Billen, Gary L. Burgess, Charles O. Grubbs, Kenton T.  Schmitz, Ronald R. Scott, Larry B. Thimes, Joseph L.	Central State College, Edmond, Okla. University of Missouri, Kansas City Kansas State Teachers College, Emporia Southern Illinois University Central State College, Edmond, Okla. University of Notre Dame
<b><i>Los Angeles</i></b>	Baird, Charles A. Crosetto, Pierre F.  Daitch, Frederick A. Dutton, Darryl W. Gazaway, George P. McElvany, Kenneth E. McPherson, Harry J. Nakamura, Emi (Miss)  Plotnick, Mark E.	Brigham Young University California State College at Long Beach San Fernando Valley State College San Fernando Valley State College Delta State College University of Redlands California State College at Fullerton University of California at Los Angeles Northern Arizona University

NEW STAFF MEMBERS

<b>Los Angeles—Con.</b>	Puglia, Frank R.	Fresno State College
	Stenger, Michael A.	California State College at Fullerton
	Sternberg, Neil A.	California State College at Long Beach
	Vigen, Gregory L.	San Diego State College
	Welman, Jeanne K. (Miss)	Northern Arizona University
	Yeilding, Andrew C.	California State College at Fullerton
<b>New Orleans</b>	Cazenavette, George J., III	Loyola University
	Landreneau, Diane M. (Miss)	Louisiana State University
	Sumrall, Noel E., Jr.	Mississippi State University
	Vallarian, Ronald L.	Delta State College
<b>New York</b>	Amato, Peter L.	New York Institute of Technology
	Englert, George R.	Belmont Abbey
	Farinella, Joseph	Fordham University
	Galanthay, Joseph C.	Manhattan College
	Gast, Raymond L.	Rider College
	Gazzoli, Frederick C.	Fordham University
	Geras, Lynne (Miss)	Fordham University
	Levine, Paul E.	Case Western Reserve University
	Okner, Arthur M.	Long Island University
	Person, Kathleen E. (Miss)	College of New Rochelle
	Plessing, Rudolf F.	Baruch College of the City University of New York
	Ploshnick, Arlene J. (Miss)	University of Bridgeport
	Tschirhart, John E.	City College
<b>Norfolk</b>	Barchi, Thomas J.	Catawba College
	Everett, Harry C.	East Carolina University
	Jessup, Norman L., Jr.	Atlantic Christian College
	Hansen, Michael R.	Old Dominion College
	Latta, Paul A.	Atlantic Christian College
	Powell, William R.	Virginia Commonwealth University
	Richter, Steven S.	Pace College
	Simpson, Bradley D.	Old Dominion College
<b>Philadelphia</b>	Brown, Kenneth H.	Pennsylvania State University
	Jassmond, William A.	New Hampshire College of Accounting
	Justice, William S.	Pennsylvania State University
	McDonnell, Gregory D.	Pennsylvania State University
	Stepek, Michael J.	LaSalle College
<b>San Francisco</b>	Biesi, Joseph D.	San Francisco State College
	Dunphy, Denis P.	San Jose State College
	Grossman, James A.	San Jose State College
<b>Seattle</b>	Arthur, Robert B.	Southern Oregon College
	Blackstone, Robert L.	The Boeing Co.
	Miller, Mark V.	Portland State University
	Olson, Sanfred N.	University of Oregon

NEW STAFF MEMBERS

*Washington*  
*(Falls Church)*

Acree, Diane G. (Miss)  
Brand, Joseph E.  
Cotton, Charles S.  
English, Paul G.  
Fossett, Harold F.  
Kieval, Andrew G.  
Leuthold, David R.  
Minnies, Mary K. (Miss)  
Moore, Lawrence L.  
Oleyar, Ronald C.  
Roupp, Sandra J. (Miss)  
Scheibelhoffer, Kathleen L.  
(Miss)  
Skelly, Jerry C.  
Smith, Richard K.  
Tisdale, James W.

Madison College  
University of Richmond  
American University  
University of Richmond  
University of Richmond  
Morris Harvey College  
Pennsylvania State University  
George Mason College  
University of Maryland  
University of Richmond  
George Mason College  
Delaware State College  
  
Morris Harvey College  
American University  
St. Andrews Presbyterian 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.

### ***Managing by Design . . . For Maximum Executive Effectiveness***

By Ray A. Killian, American Management Association, Vail-Ballou Press, 1968, 370 pp., \$11.25.

The author, who is vice president and director of personnel and public relations for the 400 Belk Department Stores, focuses his book on today's demand for a new type of manager. Such a manager is (1) dedicated to improving company operations, (2) capable of efficiently organizing and directing the company's most expensive and vital resource—its people, (3) able to successfully blueprint plans and follow through with purposeful action, (4) able to build individual and group action through realistic patterns of total involvement, and (5) one who believes that maximum contribution is based on professional performance.

This book is a must for GAO professional staff members. It provides an understanding of the features of a successful management system—an excellent criterion for evaluating the management systems we encounter during our reviews.

The book is organized in six parts, of which I and II are probably the most important.

### *Part I, Foundation for Management.*

This part establishes the overall framework for a management system designed specifically to accomplish results rather than processes. For example: "Managers must manage! They must manage individual tasks and group tasks so as to best serve the long- and short-range goals of the company. Perhaps the most significant distinction between a 'dead' and a 'growing' management is the difference between just letting things happen and managing aggressively in a planned, anticipatory, take-charge manner that assures that the right things will happen."

The author devotes a considerable amount of space to company philosophy, an essential ingredient to result-oriented organizations. He believes that corporate philosophy can be created to serve the purpose of the enterprise and that this philosophy can be altered, adapted, improved, and constantly updated to serve changing needs.

From the individual's standpoint, focusing on results rather than methods or procedures forces the individual manager to recognize that his purpose in the enterprise is not the sanctification of the processes but the attainment of the organization's goal. Systems are

necessary but should not be, in and of themselves, ends for the individual to accomplish.

*Part II, The Skills of Professional Management.* This part, the largest section of the book, is devoted to the sequential actions that each manager must take to be successful. A chapter is devoted to each of these skills:

- Managing by Objectives for Improved Results.* Every supervisor who is responsible for a segment of the work or a piece of the total goal must accept responsibility for his own results. This is not enough. He must also accept a share of the responsibility for the entire company's results.
- Planning: Blueprinting the Action.* The effective manager, unwilling to gamble with his future and that of the company, will establish ambitious, yet feasible, goals, make plans to achieve them, and keep those plans updated and result oriented.
- Organizing for Maximum Goal Achievement.* Organization is the resulting systematic arrangement that enables the team to work together more effectively than its individual members could function alone and creates greater total results than the sum of the results achievable by the individuals.
- Controlling Conformity to Plan.* Rather than stifling individual initiative, controls bolster it. The manager is forced to use his ingenuity to solve his problems

creatively and to strive daily for results based on maximum utilization of available resources within the constraints applicable to his situation.

- Performance Standards: Assuring Goal Achievement.* A standard of performance is an expression of the conditions which will prevail when a job is being done well. It provides a systematic and orderly basis for on-the-job interaction and facilitates maximum individual achievement and self-realization.
- Improving Performance and Potential: The Appraisal and Counseling Program.* The individual's need to know how he is doing can provide the foundation for job satisfaction and development only when met by the man's superior in such a way as to achieve these desirable goals.

*Part III, Maximizing Managerial Performance.* This part deals primarily with the recruiting, selecting, and developing of individuals throughout the organization to ensure a continuous flow of management talent available to meet the organization's future challenges.

*Part IV, Key to Human Understanding and Response.* This part contains some very cogent comments on communication and verbal exchange. The author makes the bridge between concepts and practical implementation in the job situation.

*Part V, Management's Unique Challenges: Today and Tomorrow.* This part

emphasizes profits and the utilization of EDP in the management process. It also has a very interesting chapter on how the executive interacts with the world outside.

*Part VI, Conclusion: Impacts and Imperatives.* This final part sums up the major points made by the book and should, in my opinion, be the first chapter to be read by anyone seriously interested in being an effective manager.

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Overall, I found this book to be one of the most interesting and challenging books on management that I have read. Application of the concepts and approaches delineated in the book, by each of us and our colleagues, would have a tremendous impact on the results attained by our organization.

*Irwin M. D'Addario,*  
ASSISTANT REGIONAL MANAGER,  
SEATTLE REGION.

### ***Management-Minded Supervision***

By Bradford B. Boyd, Management Institute, University of Wisconsin, McGraw-Hill Book Co., New York City, 1968, 301 pp., \$7.95.

This book, considering the number of men and women who will be promoted to supervisory positions in the next decade, attempts to set forth and explain what management expects from its supervisors. The author believes that a supervisor's needs are threefold: first, he must be management-minded; second, he needs the skills of leadership; and, third, he must possess job knowledge. He has organized this book therefore in three sections, each of which deals with one of these needs.

The author points out that management-mindedness involves (1) knowing and supporting management's philosophies, policies, and procedures, (2) adopting constant self-improvement as a way of life, (3) recognizing the vital role of communication in a smoothly functioning organization, and (4) being enthusiastic about change and skilled in initiating change.

We as GAO supervisors should be able to apply each of the above principles to ourselves to be as management-minded as we should be. For instance, we must know what GAO is, what its goals are, and what it is trying to accomplish. Then we have to know and understand GAO policies and procedures in order to carry out our assignments and act as members of management.

In view of GAO's current policies on professional development, the principles of constant self-improvement become very important. The author emphasizes that supervisors have a responsibility to keep pace with technical advances in their fields and to understand new developments in the practice of management. The supervisor can no longer be satisfied with things as they are but must improve himself constantly to keep abreast of the changes in his organization. Management today supports the principle that in the final analysis all development is self-development.

The practice of communicating is a part of our daily functioning. The author states that the effectiveness of supervisors and managers is directly proportionate to their skill as communicators and that management is communication.

Finally, each supervisor's attitude is the key to how effective he is at initiating change. The supervisor is the keyman in initiating change at the production level. As a part of the management, he has an obligation to support change with enthusiasm. Management-mindedness is measured by willingness to accept change and by the skill used in initiating it.

The second requirement which a good supervisor needs is that he must be a leader. Leadership involves (1) understanding the individual employee, (2) motivating improved performance, (3) teaching or training for results, (4) maintaining discipline, and (5) handling complaints and grievances.

The author states that understanding people in the organization begins with self-understanding. We must also develop empathy which is regarded by many as the single most important trait of a management-minded supervisor. Once we understand our employees, we are in a position to motivate them; that is, get them to do what we want them to do because they want to do it. This also involves training which greatly influences the results the supervisor achieves. The responsibility for a well-trained work force is just about the most important responsibility a supervisor has, because it is directly related to production, quality, costs, methods, safety, and morale.

In addition to understanding, motivating, and training staff, the management-minded approach calls for creating a positive climate for discipline, by which the author means training people to make punishment unnecessary. Discipline should not be thought of as

restrictive; instead it should have the ultimate goal of self-discipline.

Finally, the management-minded supervisor as a leader must be able to handle complaints and grievances. The author sums up by saying that the supervisor's job is to prevent complaints from becoming grievances while safeguarding management's interests.

The third requirement which the author feels a supervisor should possess is job knowledge. It is the factor to which management gives the most weight in selecting personnel for supervisory positions. Job knowledge includes both technical knowledge and knowing how to manage. Technical knowledge is usually acquired by education or experience with little thought of applying the technical knowledge to supervisory positions.

Knowing how to manage consists of planning, organizing, motivating, and controlling. The author defines planning as determining what needs to be done, who is to do it, and when it has to be done in order to carry out major responsibilities. Management-mindedness demands more of the supervisor than a personal ability to plan and organize. Much of the planning must fit into plans that are developed at higher levels and therefore should be organized to implement those plans as efficiently as possible.

Once a supervisor has planned and organized the work, the next step in the management process is to put the plans in motion. Giving directions and orders unleashes the plans and begins their implementation. Good orders should be clear, concise, complete, con-

siderate, and reasonable. Giving orders is a five-step process which is usually carried out with little conscious effort on the part of the supervisor. The steps are planning, explaining, checking, releasing, and follow-up.

The final phase of knowing how to manage involves controlling. Its purpose is to ensure that what has been planned and directed is accomplished. Effective control is dependent on skillful execution of the planning phase of the management process, because plans provide the standards against which performance is measured in the control phase. Therefore, the author believes that the control function involves (1) setting goals and standards at key points in a process, (2) measuring per-

formance against those standards, and (3) taking corrective action or making adjustments.

The author concludes by saying that all the above principles contribute to the wisdom of a supervisor's decisions and the skill with which he implements them. His value to his organization is in the quality of his decisions.

This book provides a good orientation in basic management philosophy and an excellent summary of what management today expects of its supervisors. I recommend it for GAO staff members already in supervisory positions or who expect to be promoted to such positions.

*James J. Grace,*  
SUPERVISORY AUDITOR,  
NEW YORK REGION.

## ANNUAL AWARDS FOR ARTICLES PUBLISHED IN THE GAO REVIEW

Cash awards are available each year for the best articles written by GAO staff members and published originally in the *GAO Review*. Each award is known as the GAO Award for Significant Contribution to Financial Management Literature and is presented during the GAO awards program held annually in June in Washington.

One award of \$250 is available to contributing staff members 31 years of age or under at the date of publication. Another award of \$250 is available to staff members over 31 years of age at that date.

Staff members through grade GS-15

at the time of publication are eligible for these awards.

The awards are based on recommendations of a panel of judges designated by the Comptroller General. The judges will evaluate articles from the standpoint of the excellence of their overall contribution to the knowledge and professional development of the GAO staff, with particular concern for:

Originality of concepts.

Quality and effectiveness of written expression.

Evidence of individual research performed.

Relevancy to GAO operations and performance.

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2. Except where otherwise indicated, the articles and other submissions generally express the views of the authors, and they do not necessarily reflect an official position of the General Accounting Office.
3. Articles, technical memorandums, and other information may be submitted for publication by any professional staff member. Submissions may be made directly to liaison staff members who are responsible for representing their offices in obtaining and screening contributions to this publication.
4. Articles submitted for publication should be typed (double-spaced) and range in length between five and 14 pages. The subject matter of articles appropriate for publication is not restricted but should be determined on the basis of presumed interest to GAO professional staff members. Articles may be submitted on subjects that are highly technical in nature or on subjects of a more general nature.

# THE GAO REVIEW

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Office of the General Counsel.....	<i>Milton J. Socolar</i>
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