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management adviser

May-June, 1972

Accurate Standard Costs for Foundry Labor and Overhead

J. Louis Wargo



A Publication of the American Institute of Certified Public Accountants

A kid with leukemia can die from a cold.

Leukemia is a disease of the blood-forming tissues. It keeps the body from producing the necessary amounts of normal white blood cells to fight infection.

An infection that means a day in bed for a normal child is a threat to the life of a child with leukemia.

Today research has made enormous progress. At one time, leukemia victims lived only a few months. Now, in some cases, we can prolong their

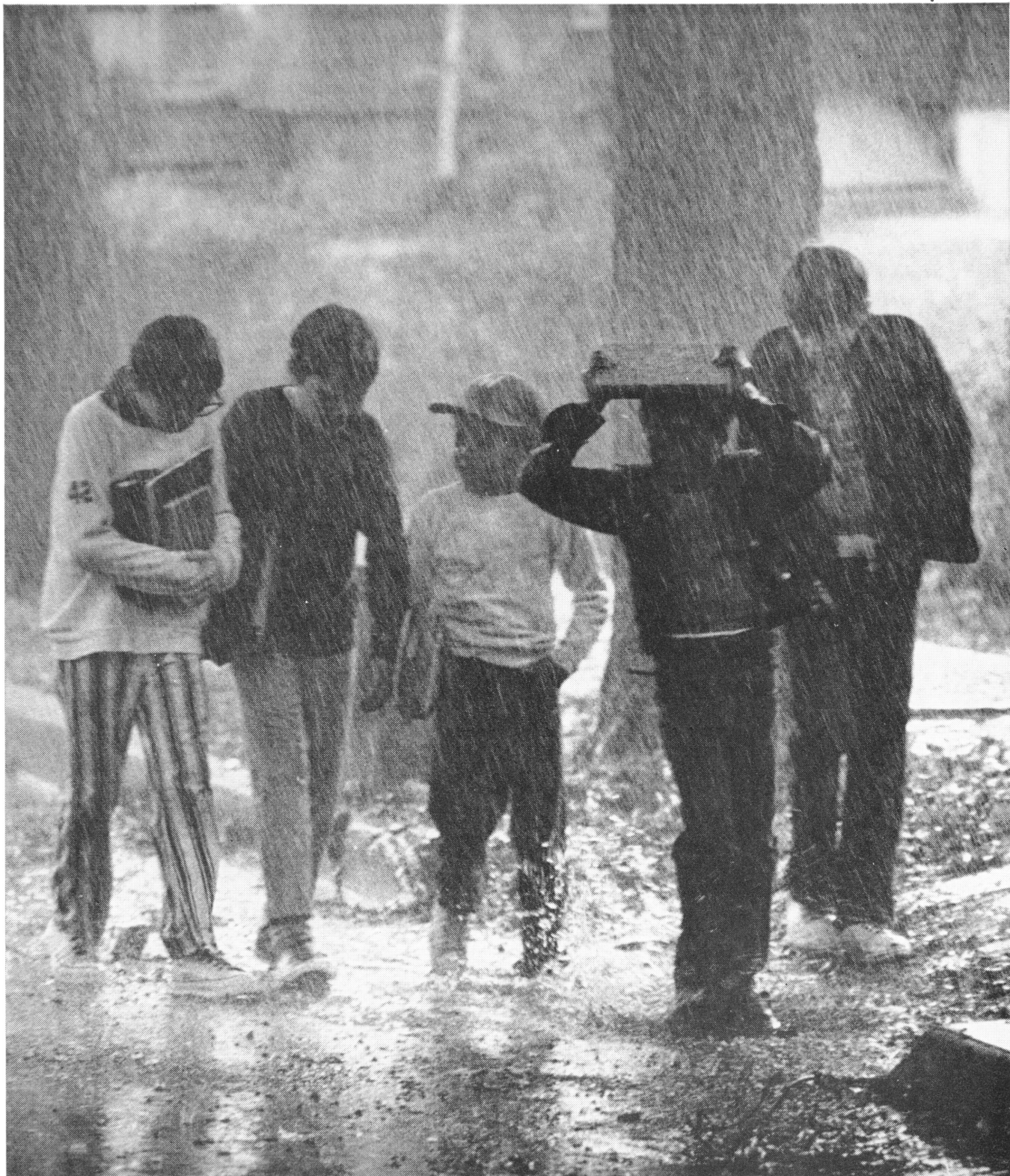
lives a few years. That's good. But not good enough.

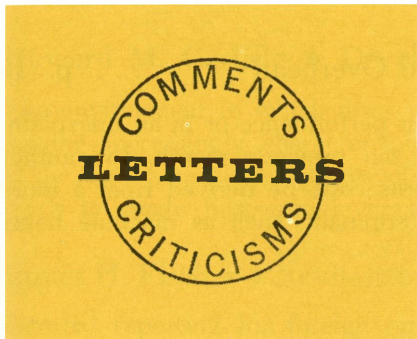
Even though we're closer to a cure, leukemia is still the major cause of disease and death in kids between the ages of 3 and 14.

We want to save the life of every leukemia victim.

We can't do it without a healthy contribution from you.

**We want to wipe out cancer in your lifetime.
Give to the American Cancer Society.**





Dear Sir:

I appreciated your publishing "Accounting Volunteers Aid Minority Business in New York City," on page 7 of the January-February, 1972, issue. As a member of the New York State Society's Committee on Community Affairs and a person who has a healthy respect for the talents of the smaller CPA firms in the field of management consulting, I feel prompted to supplement the previous report.

For some time now, minority enterprises in New York and New Jersey have had the benefit of interested and concerned CPAs rendering management consulting and advisory services. Interest in such services has been sparked by thoughtful community relations efforts of the respective CPA state societies, which have established committees to plan and coordinate these services. Knowing well that a number of larger CPA firms had established their own community assistance programs, the respective committees directed their appeals to CPAs in general and obtained volunteers principally from smaller CPA firms. As of the time of writing, there are over 100 volunteers available in the New York City metropolitan area and in upstate New York, principally the Roches-

ter area, and about the same number in New Jersey, principally in and around Newark, Paterson, and Camden.

In general, contact with the minority entrepreneur in need of help is established through a recognized minority business assistance agency contacting liaison representatives of the CPA state society committees. Often the agencies have to be sold on the availability and competence of professional volunteer help. Through a number of successfully concluded client engagements the appeal of the programs has been broadened, and the image of the CPA as a cold fish with a green eyeshade is beginning to yield to the much better image of the concerned individual who will do all he can to increase the viability of minority business. Many of the minority entrepreneurs may require ongoing assistance; this is generally not provided by the volunteers acting as consultants. They are, however, instrumental in helping to locate sources of ongoing assistance and of business management education.

To be more specific, let me present a case history. The client, a lady with some experience in personal, door-to-door, and group selling of cosmetics and women's wear, but without in-store retailing experience, required assistance as to the practicability of opening a small store of the boutique type in midtown Manhattan. The volunteer, Leonard C. Hirsch, CPA, examined the proposed location as to adequacy, neighborhood, and cost, studied present sources and conditions of supply, and then set up projections of level of sales required to break even, of estimated capital

requirements for starting up, and of the extent of financing help required. In so doing, the volunteer supplemented his own knowledge through discussions with a realtor and a retail consultant, and reached the conclusion that, at this time, the proposed venture would be unlikely to break even. The recommendations given the client included suggestions for gathering experience in full-time or part-time selling in a boutique type store, for lining up additional apparel suppliers and obtaining advice as to appropriate merchandise to be stocked, and possibly starting cosmetics distribution in an off street-level location to save on operating costs. The volunteer also referred the client to a resource person at the National Retail Merchants Association. Since the recommendations were given to the client only a short time ago, it is not yet possible to indicate client reaction.

While perhaps not all the presently available volunteers have been used to indicated capacity, it is probable that the need for capable volunteer help will continue to increase. Those interested in participating in established programs should contact the respective CPA state societies.

John Rapp, CPA

*Louis Sternbach & Company
New York*

Currently 27 state CPA societies have established programs of assistance to minority business enterprise. The principal objective of the AICPA committee on economic opportunity is to encourage state societies to develop these assistance programs—Editor.

J. Louis Wargo • Accurate Standard Costs for Foundry Labor and Overhead p. 19

Traditionally, foundry product costs and prices are expressed in terms of pounds of castings. However, unless there is only a minor fluctuation in product mix, the comparison of actual costs to budgets established on a per pound basis often results in an incorrect

measurement of cost performance or in an unexplainable change from the previous month, the author observes. He suggests costs be derived from a more specific budget determinant, such as machine hours or units produced.

**Belverd Needles, Jr., James C. Caldwell and Doyle Z. Williams • Pollution Control:
A Framework for Decision Making and Cost Control p. 24**

Those responsible for monitoring the financial health of an enterprise must have a firm grasp of the dimensions of the issues surrounding the control of pollution and its related costs, the authors maintain. A Pollu-

tion Control Information System is presented which identifies the internal and external constraints and critical decision points in handling the problem of pollution abatement.

John Walsh • Venturing Beyond the Pass p. 32

In most cases where ventures fail, ask management what it wants from R&D and then ask R&D what it thinks management wants, and you will get two differ-

ent answers, this consultant says. Communication between various company departments, management levels, and outside sources is necessary for success.

Guy J. Agrati • Practical Considerations in Common Stock Repurchase. p. 35

Common stock repurchase is a valuable financial tool which can be used to fund stock options, acquisitions for stock, and convertible obligations to the company, as well as enhance earnings per share, this author

declares. He outlines a method for measuring efficiency of a given repurchase proposal, relating gains resulting from an actual repurchase to potential gains from a no-cost reduction in stock outstanding.

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(formerly *Management Services*)

Howard M. Carlisle • Developing the Adaptive Organization p. 40

The environment in which firms must operate is becoming increasingly characterized by change while at the same time the complexity of business operations tends to create bureaucratic organizations aimed at

stability and control. The modern manager must seek to make his organization adaptive and innovative, the author states, and presents four structural approaches to creating a more viable operation.

James H. Fischer • Revitalizing Internal Reporting for Foreign Operations p. 44

Internal reporting for foreign operations should include key financial and operating data plus environmental data, this author says. Newcomers to the multinational scene are advised to be sure that their

foreign affiliate's local management knows the place its operation occupies in the community, the importance of contacts with local government, and the necessity of keeping abreast of local news developments.

Louise H. Dratler • Managing Pension Funds Sensibly, Profitably, Safely p. 51

Pension fund investments can be handled in several ways: through the employment of one outside "money manager," of several, or of an in-house adviser. The

pros and cons of each approach were discussed at the Seventh Annual Financial Conference of The Conference Board and are reported on in this article.

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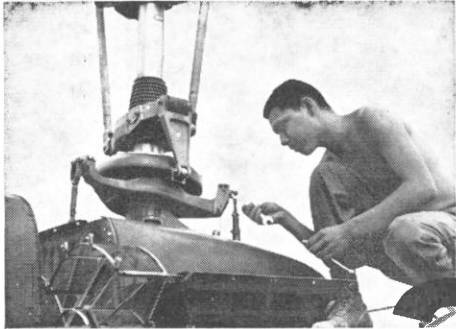
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Hire the veteran. Hire ability.



The ability to do a job well. To learn. To take orders. And to give them. ■ The Armed Forces spend over \$3 billion yearly on training servicemen. That means many veterans have skills you can use from the moment they're hired. And if they need further training, monthly allowances under the GI Bill can supplement their wages while they are in approved training programs. ■ Hire veterans. Put their ability to work. ■ For help in hiring veterans, contact your local office of the State Employment Service; for on-the-job training information, see your local Veterans Administration office.

Don't forget. Hire the vet.



**JOBS FOR
VETERANS**



people, events, techniques

Finance, Marketing, Administration Follow Division Management as Major Sources Of Top Management Appointment, Michigan Survey Indicates

Who is most likely to be promoted to top management positions in American industry? While division management is the chief source of newly promoted presidents, executive vice-presidents, and vice presidents, major secondary sources for these posts are finance, marketing, and administration, a recent survey finds.

The survey was conducted by the Graduate School of Business Administration of the University of Michigan with the cooperation of the executive search firm of R. M. Schmitz and Company, Incorporated, Chicago. The report covers 563 executives promoted during the first six months of 1971.

The *Report on Management Succession* was prepared by Dean Floyd A. Bond and Associate Dean Alfred W. Swinyard, both from the business school.

"Promotions to top executive positions were largely made from within the firm," the report states. However, "in the case of presidents and chief executive officers nearly one out of five came from an outside company immediately prior to accepting the new position. Indeed, this ratio somewhat understates the extent to which these promotions presented an infusion of new ideas into the company by hiring from the outside. Many presidents and chief executive officers said to have

been hired from within had, in fact, been with their companies for only short periods of time."

Eighty-five per cent of the newly promoted executives were found to be college graduates, and 37 per cent held advanced degrees. Only 2.5 per cent had just a high school education and nearly 4 per cent held doctorates. Business and engineering were the most common fields of study among the executives holding bachelor's degrees. Twenty-six per cent of the executives held master's degrees; about half of these degrees were in business. Law degrees were held by 11 per cent of the executives.

The average age for executives

promoted to presidents that were not chief executive officers was 48 and the average age for those promoted to president and chief executive officers was 46.

"The average age reported by the executives promoted during the first six months of 1971 is about two years lower than that reported five years ago," the study observes.

The survey found the average salary for president and chief executive officers was about \$64,000; for presidents not CEOs, \$68,000; for executive vice-presidents, \$54,000; and vice presidents, \$45,000.

Thirty-nine per cent of the newly promoted executives were given stock options; over 70 per cent expected to receive a cash bonus; and about one-third of the executives participated in a deferred profit-sharing plan, the research team found.

The researchers are now analyzing similar data collected since 1966 to identify significant five-year trends and to provide more detailed analysis on key aspects of management succession and compensation. Those interested in these findings may write to Associate Dean Swinyard, The Graduate School of Business Administration, University of Michigan, Ann Arbor, Mich. 48104.

Executive Recruiter Says Middle Management Jobs Becoming More Plentiful

Middle management positions are becoming more plentiful, according to one executive search expert. This indicates to him that economic conditions are improving.

The biggest cutbacks in managerial talent during 1970 and 1971 were at the middle management level, reports Kurt Einstein, president of Einstein Associates, New York.

"Middle-management personnel were directly engaged in execut-

ing many of the programs that were eliminated," Mr. Einstein said. Consequently, "they were left with no real job responsibilities and were expendable."

Now the companies need to "go outside to obtain the personnel qualified to implement and directly supervise new projects," he said, because they are making plans for expansion again. Mr. Einstein said that acquisitions and mergers are also being sought "in anticipation of more profitable conditions" this year.

Mr. Einstein reports there is increasing hiring from minority groups for management positions. This observation agrees with a similar finding made by another executive search firm president, Les Korn (see *M/A*, March-April, '72, p. 10).

Maryland Bank Offers Consulting Services In Mid-Atlantic Area

The Maryland National Bank has announced it is now offering a management consulting service to businesses in the Mid-Atlantic region.

The service is to be known as Maryland National Consultants.

Chairman of the Board Robert D. H. Harvey explained, "As American business continues to become increasingly complex, the common concern of all managers will be the need for knowledge of how to best utilize their organization's resources to make intelligent decisions affecting growth and profit.

"As the external consultant is being looked to for ways in which problems can be transformed into opportunities for progress, it is appropriate for banks to offer our experience and expertise in this field to the business community."

The services Maryland National Consultants will offer include cost reduction, work measurement, budgetary control, and profit planning.

ITT Cost Reduction Program Adapted for Other Companies

Many companies are asking their employees for new ways to save money on their own jobs. ITT, the originator of this idea, is said to have saved \$73,000 for every \$1,000 it has put into this employee cost cutting program.

"The main reason for the program's success is that it gets across the cost reduction message in terms that are meaningful to the employee," said George J. Schmidt, president of Industrial Motivation, Inc., New York. Mr. Schmidt's communications consulting firm has interpreted ITT's idea into its own Buck A Day (BAD) program and says it has had a high degree of success with it in companies of all sizes.

"Let's face it, just about every job has the potential for a dollar a day in cost savings and when you challenge the employee he can frequently find it—and sometimes a lot more. The big point is that cost reduction becomes something that the employee helps to do, rather than something that is done to him," Mr. Schmidt explained.

Although the program offers the workers no monetary rewards, some companies have had close to 100 per cent employee response to the BAD program, Mr. Schmidt said. He attributed this to the employee's concern with the financial health of his company. The employee is "just waiting for the invitation to participate," the consultant said.

Industrial Motivation uses posters, booklets, charts, mailings, newsletters, and presentations in its tongue-in-cheek BAD campaign. In one issue of the program's weekly newsletter, the employee is shown that his company is sympathetic to his own inflationary problems through the presentation of a plan to start a BAD program at home for the reduction of household expenses by a dollar a day.

'Age of Skepticism' Prompts Computer Users to Demand System Adaptation to Their Needs, AMA Speakers Assert; Survey Shows Charge-Back Programs Well Accepted

EDP users are no longer willing to accept and conform to the limitations of the computer; users are demanding data processing that fits their needs, speakers at the American Management Association's Annual Systems Management Conference, March 6-8 in New York, maintained. The days of computer worship are over, the speakers said.

Donald P. Kircher, president of The Singer Company, told the conference, "We are now entering a period during which the users of information systems will assert their right to full partnership with equipment designers and suppliers. In fact, they will go somewhat further and insist upon being *primus inter pares*, that is, first among equals."

Mr. Kircher declared, "the Age of Faith is over and the Age of Skepticism is upon us . . . intelligent users are about to lay profane hands upon these systems with the purpose of having them bent and shaped to perform the tasks which they define for them rather than supinely genuflecting and accepting the gospel according to the experts."

In Singer's own case, management decided it needed an inexpensive electronic terminal that could be operated by sales people without training in each of its more than one thousand retail stores. Singer presented this need to various equipment suppliers and "they exhibited a vast lack of interest in designing and supplying such a system," Mr. Kircher said.

However, Singer had acquired a business equipment division that it persuaded to undertake the task. Singer then decided to broaden its objective and to serve the entire retailing industry as well as its internal purpose with the new devices, Mr. Kircher explained.

"Once the users fully understand that the material achievements of the last two decades can now, by

the exercise of some imagination on their part and a different type of innovation on the part of engineers and suppliers, be fully applied to their specific problems, applications now undreamt of can quite rapidly become reality," Mr. Kircher said.

A less dramatic means of filling a company's systems needs was described by John F. Odeneal. His company decided time sharing could solve its EDP problems.

"Primarily the very factors required to introduce computers to industry led naturally to the emphasis on batch processing, because that is where the immediate savings lay," explained Mr. Odeneal, manager of systems of the international division of FMC Corp., New York. "This, in turn, directed attention to rearrangement of data processing procedures to accommodate the computer (parasitic) rather than 'doing our thing,' and making the computer help us (symbiotic)."

When FMC International was designing its information system it decided that the system must be symbiotic. "Symbiotic, because an MIS must use the information already available," Mr. Odeneal said. "The whole operation of a company cannot be stopped to collect extraneous data for 'special reports to management.'"

Although FMC has extensive computer facilities, Mr. Odeneal stated, the FMC International MIS operates on time sharing. He compared this to driving a Ford when one could afford a Cadillac. The reason for this is "because we prefer to drive ourselves rather than be chauffeur-driven."

The five major reports that form the backbone of the FMCI MIS are: individual daily order and billing summaries; insurance reports; product summaries; collection dates; and open order product summaries.

Explaining the economics of the system, Mr. Odeneal said, "The MIS I am describing costs FMC International about \$1,000 a month in time-sharing charges. The order and billing write-up about \$2,000. I mention it . . . to point out that during the October-November dock strike our costs dropped rapidly since we didn't process as many orders. A further savings, however, was that we didn't have to pay personnel during that period."

Another conference speaker who touched on the economics of the data processing operation was B. J. Wright, director of data systems services for Percy Wilson Mortgage and Finance Corp., Chicago, Ill. In his presentation, "Managing Data Processing Operations," he advised, "Every operations manager, whether he is requested to or not, should prepare a one-, two-, and five-year monetary, equipment, and people plan. This plan should include a detailed yearly budget for the operations area. This budget should then be used as a working tool to establish the position of his operation in relation to where the operations manager is expected to be.

"The historical data acquired by comparing this budget with actual information can then be used to determine the validity of future budgets. It is good to keep in mind in establishing budgets that we need not use a complex tool when a simple one will do the job. Too many times we budget for paper clips and lose sight of the cost of operations."

Other advice offered by Mr. Wright included: operations needs follow-up audit for all phases of its plan and work; operations should establish standard times for jobs according to volume and charge on that basis; and operations must look at expenses in light of money saved and money earned.

Nationwide Insurance Companies has found a restructured work week a key factor in improving the economics of its EDP operations, Bradley D. Kirk, vice president-systems and data processing, told the conference.

"The high cost of computers, whether rented or purchased, makes it essential to maximize the number of hours that computer equipment is used," Mr. Kirk said. "For our multicomputer center, we have four 15-operator shifts, each shift working a 12½ hour day and a three-day week."

Working hours are either 11:30 a.m. to midnight, or 11:30 p.m. to noon, on either Monday, Tuesday, and Wednesday, or Thursday, Friday, and Saturday. Sunday operations, when required, are an overtime situation. The shifts periodically rotate so there is no salary differential. The computer center is located in Ohio and state law does not permit women to work 12 hours a day, consequently no women are operators.

"The three-day work week restricts a person to mostly working, eating, and sleeping during his three days on the job, and requires a higher than average degree of personal maturity and recognition of job responsibility. Normal life patterns are interrupted and personal relationships and family activities are affected," Mr. Kirk admitted. "On the plus side for the individual is the very real four days off following his work week completion."

Mr. Kirk concluded, "We, at Nationwide Insurance, having had seven years experience with the three-day work week, can truthfully say that it has solved many more problems than it has created . . . In my opinion, any multi-shift operation with heavy weekend usage of overtime should give serious consideration to some form of the three-day work week."

One of the final conference speakers was Dr. William Dill, dean of the Graduate School of Business Administration at New York University. He characterized the generation of computer users

now emerging from the nation's colleges and graduate schools.

The new generation of users has had some basic training in computer-related areas and accepts computers as personal tools and part of the business scene, he said. They may be better able to communicate with systems designers and managers than their predecessors. However, Dr. Dill said, they will not necessarily support expanded budgets for systems groups or the expansion of the computer's influence.

Characterizing the new graduates, Dr. Dill said, "Systems to the best of them are not just computer systems, not just organizational systems, but entities in which the whole man is recognized and respected.

"If you would like today's young graduates to be less concerned about the whole man and more 'gung-ho' about expanding computer usage in business and government, you invited the wrong dean to speak to you today," Dr. Dill told the AMA conference.

Charge-back generally accepted

Perhaps the newest information conveyed at the conference was saved for the end. The findings of an AMA research report, "Management Systems in the 1970s: Selling and Servicing a Tougher Customer," a study made by Milton M. Stone, a consultant and contributing editor to *Datamation*, and Dale Tarnowieksi, an AMA senior research associate, were presented by *Datamation* Editor Robert B. Forest. The AMA is publishing the complete survey in June.

They received survey replies from 357 information systems executives and 220 general management executives.

Among their findings was a general acceptance of the charge-back system for EDP operations, in which the department or division that ordered a specific computer operation is charged with the expense of the operation. Apparently both systems and general executives feel this approach results in

cost-justified systems requests and does not hamper systems development, as feared.

While the general executives feel that accessibility of computer-based information will eliminate the need for some layers of management, more than half of the systems executives disagree, the AMA study shows.

Skills requirements rising

It is interesting that both groups of managers feel that systems managers of the future will only need a limited amount of technical knowledge, but will have to have managerial, communication, and business skills.

The entire research report will be distributed to all members of the AMA's Management Systems and Sciences Division in June. Other AMA members may order the report for \$5 a copy, non-members for \$7.50. Orders should be sent to the order services department or the AMA bookstore at AMA headquarters, 135 West 50th Street, New York, N.Y. 10020.

Ivy League Colleges Join in Study of Undergraduate Costs

Nine eastern universities and colleges are engaged in a cooperative study of the cost and financing of undergraduate education.

The study is supported by a \$310,000 grant from the Alfred P. Sloan Foundation. The participating schools are: Amherst College, Brown University, Dartmouth College, Harvard University, the Massachusetts Institute of Technology, Mount Holyoke College, Princeton University, Wellesley College, and Wesleyan University.

Dartmouth President John G. Kemeny explained, "The crisis in higher education brought about by rising costs, expanding program demands, and decreasing sources of

financial support has challenged colleges and universities to reexamine their plans for financing the educations they provide."

Dr. Kemeny stated that the study will serve as a model for other colleges and universities facing the same problems and may "ultimately make possible a multi-institutional program to meet the problem of financing undergraduate college education."

Four areas reviewed

The study will amass data in four areas: the total cost of undergraduate education at each of the participating schools; the ability and willingness of the families of all students at the nine institutions to pay a share of that cost; the ability of students to pay for a larger share of their education through future earnings; and various plans for collection of fees and provision of financial aid.

From 40 to 60 per cent of the undergraduates currently at most of the cooperating institutions receive some form of financial aid. In recent years the colleges have increased financial aid to broaden the mix of their student bodies, to provide opportunities for minority group members, and to ease the pressure of costly tuition bills on middle and lower income families.

Ready for Class of '77

December, 1972, is the target date for the completion of the study. The college presidents hope the programs indicated by the study will be implemented before the acceptance of the class which will enter college in September, 1973.

Each college will appoint an administrative officer as project director to be responsible for implementation on his or her campus and to work with the policy committee, composed of one top executive from each participating school. An independent consulting firm will be retained to assist the project directors and policy committee in collection and coordination of data.



New NCR 399 can serve as either input or output unit to another computer; can serve as self-contained data processor; or can be used as electronic accounting machine.

NCR Shows Versatile Minicomputer That Sells For \$14,000; Unit Will Rent for \$420 a Month

A minicomputer which combines the abilities of a low-cost data processing system, an electronic accounting machine, and also serves as either a terminal input or output unit for a larger central computer was shown recently in NCR world headquarters in Dayton, Ohio.

R. Stanley Laing, NCR president, in presenting the product, the 399, said that it has the simplicity of an operator-oriented electronic accounting system, but also the speed, computational ability, and decision making capacities of a computer.

"It can function as a small, self-contained data processing system or as a satellite to most larger computer systems including members of the NCR Century series," he went on. "In addition a 399 can communicate with another 399, thus making it possible to link together

at low cost widely scattered plant or office data processing operations."

With the basic system priced at \$14,000, or renting for \$420 a month, NCR expects to install thousands of the systems over the next few years across a wide spectrum of business, Laing said. He listed as some of the markets NCR expects to attract, retail organizations, wholesale firms, hospitals, and school and government offices.

The system has a modular design, allowing it to be expanded as the user's requirements change. For example, the basic system's 8K memory capacity can be increased in 2K modules by simple substitution of larger memory modules.

Another innovation is the use of magnetic-type cassettes not only for data storage but also for entering

various data processing programs into the computer. Cassettes can also capture data as a by-product of normal posting operations performed on the computer as part of regular accounting operations. These stored data can later be entered into the computer, so that it in turn can automatically prepare management reports and update business records.

First deliveries of the 399 are scheduled for this fall and volume production will begin in 1973, Laing said. "The 399 is one of the most important products ever introduced by our company," he added. "We are anticipating a market measured in the hundreds of millions of dollars over the next several years for this new family of equipment."

Use of Minicomputers For Decentralized Companies Praised

While the minicomputer may be small, the number of its potential applications is not, an American Management Association briefing pointed out March 10.

One enthusiastic mini user, John J. Wilk, told the audience, "I don't think you ~~should waste any time.~~ Jump in; ~~the water's warm!~~"

Mr. Wilk is president of TransNet Corporation, Union, N.J., an EDP service company. One of the computers used in TransNet's time sharing operation is a minicomputer. It has been used by TransNet clients for: inventory control, entry of orders, updating invoices, survey analysis, parts explosion, financial reporting, production control, job costing, coordinate geometry, and teaching programming to high school students.

"There are few areas where the minicomputer does not apply," Mr. Wilk said. "The minicomputer is not a toy," he reminded the businessmen. "It is a replica of the larger and more expensive computers."

Mr. Wilk told the audience that they should not fall prey to the idea that a computer must be completely filled with programs and running all the time. Even with limited usage a computer can be economically justified, he said.

TransNet was once consulted by a frozen food company that had four warehouses and a perishability problem, Mr. Wilk related. TransNet suggested that a minicomputer could help to solve the company's spoilage problem by keeping track of which items came in when and in what order they should be sent out. Even though the minicomputer would only be in use 10 per cent of the time, TransNet felt the mini was advisable, Mr. Wilk declared.

The minis are particularly well suited to small companies, warehouses, and divisions or departments of larger organizations, Mr. Wilk said.

Although he does not know of a management information system that is now running on a minicomputer, Mr. Wilk predicted it was only a matter of time.

Many people are reconsidering the economies of scale of large central processing centers, Paul A. Gillis, director of systems development for Computing and Software, Inc., Paramus, N. J., told the AMA briefing.

~~While in theory~~ these economies ~~exist, in practice~~ the large scale operations have proved inefficient and companies are thinking of decentralizing their computer operations again, Mr. Gillis said.

The minicomputers allow management at remote locations to use data processing for discrete functions, such as inventory control, and then to send the summary results to the company's large central processing unit, he explained.

Mr. Gillis recommended minicomputer software be provided by a turnkey arrangement. Since the supplier must live up to his promises, he is more likely to give the user an honest appraisal of what the system can be expected to do. However, Mr. Gillis cautioned, user personnel should be familiar with

the tables which permit the user to vary his system within prescribed limits, at least, and, preferably, with the software logic as well.

Reliability of the minicomputer system is very important and most of the minis from any manufacturer today are extremely reliable, Mr. Gillis said. But a user should determine how much a computer failure will cost him, he advised.

Restart time vs. duplexing

Mr. Gillis believes that restart time is more important to a system's reliability than duplexing is. With duplexing backup equipment is used; however, this requires a switching capability and the user must consider the reliability of the switches as well. If the system can be restarted in a fraction of a second, then the loss is negligible and the effect of the system failure can be reduced to a minimum. Mr. Gillis did add, though, that duplexing might still be necessary even if the system has a fast restart time.

Rodger Cady, manager PDP-11 engineering, Digital Equipment Corp., Maynard, Mass., also pointed out the necessity for program protection. If one element of the minicomputer system fails, does the whole system go down the drain, he asked. The minicomputer selected should embody the "fail soft" concept, he advised, which means another element can pick up the work of the one that failed.

Mr. Cady said that the peripherals for the minicomputers are more reliable than those for bigger computers because they contain a smaller number of components, and, consequently, less can fail. The disc memory systems for the minicomputers are very inexpensive, Mr. Cady said, 0.017 cents per byte in some instances.

A small disc base minicomputer system can cost \$30-40,000 for the hardware, Mr. Cady said. However, the software costs become more visible in a small computer system, Mr. Cady cautioned.

Computer Security Measures Inadequate, Diebold Reports

Many corporations are taking inadequate security measures to guard their computers against accidents and natural events, as well as criminal acts, a Diebold Research Program study recently observed.

"Despite the high risks, it is clear that investment in computer security is far too small in many corporations, and funds are poorly allocated for maximum effective protection," the report states.

An effective security program should cover all the elements of the data flow cycle, not just those that begin and end in the computer room, the Diebold researchers say.

The exposure to any given threat or combination of threats should be calculated and the bulk of the security budget expended where the exposure is the greatest, the study advises.

Danger signs that can alert the corporation to where exposure may be the greatest include: the "showcase" data center; an open-shop policy; poor housekeeping; inadequate physical protection; low employee morale; inadequate supervision and training; lack of divided control and rotation of responsibility; inadequate control of files and documentation; inadequate backup; inadequate operating procedures; no procedures for audit.

Each corporation should implement a minimal security program that includes: physical and environmental precautions; employee selection and training, morale and development, supervision; division and rotation of responsibility; tape control, backup, and records retention; audit and evaluation.

An internal computer security audit staff should be formed, the Diebold researchers advise, to operate independently of the EDP function. The individual charged with the key responsibility for security of the total information re-

source should be the one to head this audit group.

Total security is beyond reach, the study states. Corporations must always be prepared to accept a certain amount of risk, the researchers maintain, but management should demand a reasonable awareness of the amount and nature of that risk.

The Diebold Research Program is an industry-sponsored continuing study of the impact of change in management and information systems on today's decisions and planning. The program is conducted by the professional staff of The Diebold Group, Inc., a management consulting firm.

New IBM Message Unit Doubles Previous Terminal Capacity

IBM has developed a new communications controller, the 3705, that coordinates data transmission between a computer and remote terminals on as many as 352 telephone lines. This is twice the line capacity of any previous IBM control unit.

The communications controller has its own processor which enables it to free the central computer from such tasks as message assembly and allow the CPU to concentrate on more productive jobs. Control requirements can be programmed into the 3705, rather than the central computer.

The 3705 has a modular memory that ranges in capacity from 16,000 to 240,000 characters of data, available in increments of 32,000 characters.

The new controller operates with all models of the System/370 and most System/360 models. Almost all terminal devices offered by IBM can be linked to the 3705, the company states.

IBM says first customer shipments are scheduled for July, 1972. Monthly rental charges range from \$1,200 to \$10,940. Purchase prices range from \$57,000 to \$449,000.

Job Enrichment, 'Career Pathing' Advocated by Metropolitan Life

Job enrichment and "career pathing" are two techniques used by Metropolitan Life Insurance Company to motivate its employees, the company's vice president in charge of personnel, Willard W. Peck, told the Administrative Management Society recently.

The business world has "created jobs in the interest of economy and efficiency that are so sterile and so devoid of interest that, in many cases, they defy the ability of most anyone to stand them day after day," Mr. Peck said.

Complete job important

He believes that, in almost any work situation, the opportunity to do a complete job rather than just a small part is a main motivational factor.

However, Mr. Peck cautions, "no matter how much you enrich a job, and thereby motivate the people who work at it, sooner or later, an employee is going to become demotivated if recognition through advancement is not forthcoming."

He said that career pathing is particularly important to Metropolitan's younger employees. He explained the technique as the attempt to "lay out avenues of advancement within our organization, along with specific performance and development criteria."

"Meaningful purpose in life"

The college graduates of the last two or three years are driven by the need for a meaningful purpose in life, the speaker observed.

"They expect that the organization they have joined is going to make a contribution to the common good; and that they, as individuals, are going to play an active and significant role in helping their company make that contribution," Mr. Peck stated.

Companies Employing Ghetto Residents Urged to Try To Upgrade Workers' Home Neighborhood Conditions

Workers living in ghetto communities often feel totally isolated and cannot relate to others around them at their jobs, according to a survey recently completed by two professors at Temple University's School of Business Administration.

Dr. Richard H. Viola and Dr. Jugoslav S. Milutinovich surveyed the employees of two large corporations in Pennsylvania and one municipal agency in New England. They interviewed 265 blacks, 641 whites, and 23 Puerto Ricans, using the Job Descriptive Index to measure the workers' attitudes.

They concluded, "Life in the ghetto tends to develop and sustain an entirely alien set of values, both of low educational attainment, low job status, and the stifling of hope," Dr. Viola said.

"Workers reflect their frustration in their total reality relationship which in turn is reflected in their attitudes toward their jobs. They are less satisfied with their work, supervision, and promotion, and they show greater absenteeism, turnover, and lower initiative than their fellow employees, in many cases spreading their dissatisfaction among them," Dr. Viola explained.

He pointed out that as there is growing pressure to integrate work situations slum dwellers are going to bring a whole new dimension to the problem of employee motivation. The corporate identification managers hope for is not present in ghetto workers. While most whites are "used to a work culture" the ghetto dweller is not. He brings with him "problems brought on by a grinding poverty," Dr. Viola said.

"Organizations should give serious consideration to improving the standard of living of prospective employees from poor neighborhoods in order to increase efficiency through greater job satisfaction, lower absenteeism, and lower turnover," Dr. Milutinovich said.

The study also found that integrated labor situations produce no racial animosity or disrespect. Racial interaction in such situations was found to be favorably regarded by both races, and generates a high degree of mutual respect, the study states.

The researchers believe that the ghetto dweller's alienation is not brought on by any particular character traits, but is caused "by the poverty, unsanitary living conditions, crime, sickness, prostitution, drug addiction, or alcoholism, all traditionally associated with ghetto living.

"The company making a contribution to the war against poverty is, therefore, acting not only in the best interests of the people living in the ghetto, but in its own best interest as well, by investing in the source of future manpower," Dr. Viola said.

Directors' New Duties Call for Restructuring Boards: Hay Associates

The modern board of directors must protect the interests of three major groups: ownership in its traditional role; the consumer and the public; and the management group, Edward N. Hay & Associates believes. The Philadelphia management consultants assert that to attract the right people for directors, corporations must be willing to restructure and strengthen the board's role, composition, and accountabilities.

"While it is possible to find successful enterprises with all shadings of outside, inside, and mixed boards, the increased emphasis on social responsibility is making it mandatory to select a majority of

board members from *outside* the corporation," the management consultants state in a recent issue of the firm's newsletter, *Men & Management*.

"The role of the outside board member . . . demands fuller definition in light of the new importance being attached to his role," Hay says.

The firm outlined several accountabilities the outside director must exercise. The outside director should collaborate, stimulate, and communicate with the chairman of the board and the inside board members. He should review corporate performance and evaluate the allocation of financial and human resources. The director should select the chief executive officer and assure management continuity. He should also "act as a sounding board as well as a unique resource in areas of special competence," Hay asserts.

The job of recruiting new board members calls for an assessment of the board's needs. "The days when this task could be casually handed over to someone 'who might know someone good' are past," Hay states.

"Today's director must be chosen with care and caution and with an eye to how his specific background and talents will fit with the rest of the board," the firm advises.

Honeywell Defends Military Work at Stockholder Meeting

Honeywell management recently took a strong stand in defense of its Defense contracts to answer the proposed actions of a small number of shareholders.

Clergy and Laymen Concerned, an organization which holds four shares of Honeywell stock, has proposed that the company provide much more detailed information about its Defense contracts in order to enable shareholders to make in-

formed investment and policy decisions.

The Council for Corporate Review, an organization which holds ten Honeywell shares, has submitted with Clergy and Laymen Concerned a proposal to appoint a committee on economic conversion "to provide for an orderly transition of the corporation from defense-related production to civilian-oriented production so that employees . . . will be secure in their jobs and the shareholders . . . will be secure in their investments."

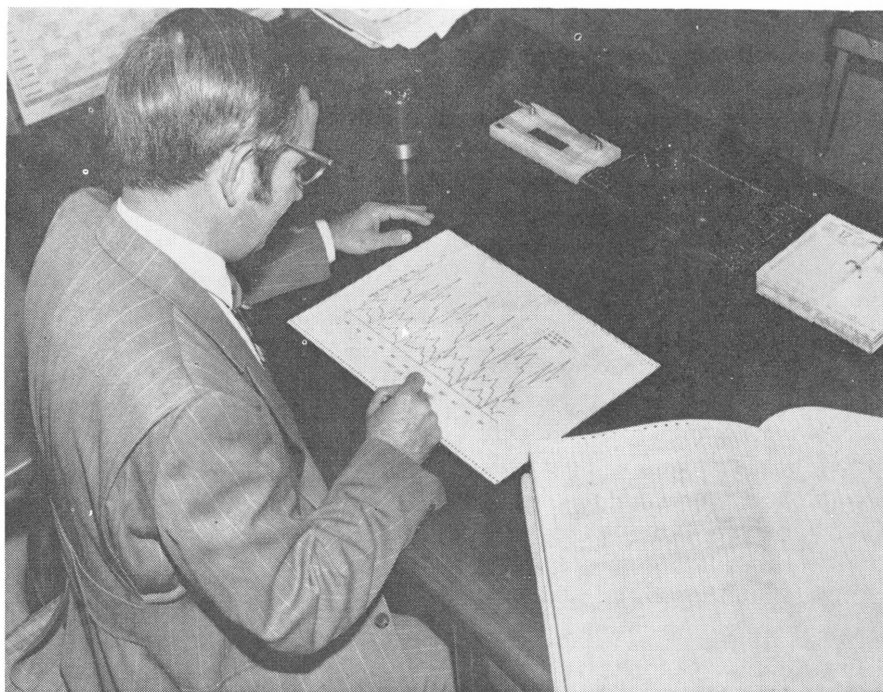
Honeywell stated in response, "Now and in the past we have said the management and employees of Honeywell desire peace as much as any group of Americans. We especially want the Southeast Asia conflict concluded. However, as long as American forces are in combat they must be supported with weapons and materials, and we plan to fulfill our commitments to the Department of Defense. In addition, assuming the Southeast Asia action were concluded, other attitudes and problems in the world require that the United States keep a defense posture at a level determined by the Administration and Congress.

"Those who disagree with this policy are free to say so, and to make investment decisions based on their own beliefs. In questioning a policy as basic as this, we believe further detailed information is unnecessary."

The company maintained that ample information about its Defense contracts is available to the stockholder through the news media, its own statements and publications, and contract announcements of Federal agencies.

Honeywell management opposes the appointment of a committee on economic conversion because, it says, its civilian-oriented production is not being held back by its Defense commitments nor does the company feel it is in its best interests to discontinue Defense-related production.

"In addition to providing an im-



Digital plotting system that can translate voluminous computer printout into easily grasped charts and graphs has just been introduced by Bausch and Lomb. Market aimed for is the financial community. COMPLIT will accept data from most computer systems.

portant supply of executive talent, the Aerospace and Defense Group . . . has greatly benefited the entire company by helping to keep it at the leading edges of the technologies on which our automation products depend," Honeywell said.

The stockholders voted on the two shareholder proposals at the April 26 Honeywell annual meeting in the Minneapolis Auditorium.

Better Cost Accounting In Defense Contracts Urged by Accountant

Better cost accounting in negotiated Defense contracts would save money for the public and benefit industry as well, Allen Peterson, a partner of Arthur Andersen & Co., told the Detroit Chapter of the National Association of Accountants.

"Improved cost accounting, including the development of cost standards and tighter cost control, will result in better communication about Defense costs and will

improve public confidence in Defense-cost estimates. Thus there will be more effective spending and contractors will be able to borrow money at lower rates. This will save money for the public," Mr. Peterson said.

Congress and the public would have more realistic estimates of the complete cost of new Defense projects if cost accounting standards and better cost control were used. Accurate cost determination would also protect industry from taking serious losses due to combinations of weak cost accounting and poor estimating, the CPA said.

Defense contractors' cost disclosure statements could be made available to the public without dollar amounts, Mr. Peterson proposed. He said that "trade secret" information should be kept confidential by the Federal Cost Accounting Standards Board.

Arthur Andersen & Co. has been pressing for changes in Defense cost accounting for several years. Mr. Peterson is a major developer of the recommended standards the firm has presented to the Cost Accounting Standards Board.

Conference Board Speakers Note Improved Loan Climate; Suggest Currency Fluctuations Be Anticipated in Company Planning

An optimistic view of the nation's economy was presented by Thomas Waaland, vice president and treasurer of Corning Glass Works, at The Conference Board's Seventh Annual Financial Conference, February 23-24.

"The economy has definitely turned the corner and will continue to improve during the year," Mr. Waaland said. "Inventories and other working capital requirements will be expanding as the year progresses. Similarly, plant and equipment spending will be increasing as profits increase and overall confidence improves."

Advises short-term loans

He called this a "vintage year" for short-term borrowing. The glass executive noted loan demand is down and the bankers are looking for customers.

"If you foresee needs for long-term capital, this could be a good year to borrow," Mr. Waaland advised. "Nineteen seventy-one was the second year in a row when business relied heavily on long-term financing and relatively little on short-term borrowing. Corporations raised a record 13.9 billion of net new funds in the stock market last year. It is estimated that 9.2 billion may be issued this year."

Further inflation foreseen

Within the decade there are financial factors that will have to be considered, Mr. Waaland said. Increased citizen demands for goods and services, at private and public expense, represent an inflationary force. There is also the potential for shortages of capital and "credit crunches" in the future.

"Will the virus of devaluation be considered a dormant cure for possible monetary or economic ills of the future?" Mr. Waaland asked.

"It is not an easy way out for future ailments."

Basic economic change

At a panel session discussing "Living with a Devalued Dollar," IBM Treasurer Charles C. Townsend, Jr., told The Conference Board members that, as a result of the many currency changes over the past year, "the basic economic nature of a particular business entity has changed, and it is necessary to recognize and cope with this on a long-range basis. The typical example is a local price increase after a devaluation to compensate for the economic change of which the devaluation is the result, not the cause. If appropriate changes are not made, the viability of the business is threatened."

Plan for currency changes

Mr. Townsend suggested that businessmen should build possible currency changes into their yearly planning. International companies should also provide for changes right away so that period results do not show fluctuation when the actual currency value change comes. For example, IBM increased its prices in terms of Brazilian currency, when that country devalued its currency, to maintain a constant value measured in dollars.

"The recent changes in broadening the bands between which currency values may fluctuate, in involving a number of currencies, and, lastly, in diminishing the utility of the dollar as a standard of measurement, have immensely complicated the conduct of operations abroad and represent a challenge to management."

Laurence B. Krause, senior fellow of The Brookings Institution, played the role of devil's advocate when he told the financial execu-

tives, "The public at large paid for the stability of the financial community."

Mr. Krause said, "The international monetary system needs change and only in a crisis situation will governments be brought to making decisions."

He predicted that the present international monetary system cannot last indefinitely because it has no management control. Consequently, "we may blunder into flexible exchange rates," Mr. Krause said. He is not against flexibility, but "if we have flexibility then let's have managed flexibility, and if we have fixed rates then let's have someone in control," the economist suggested.

IMF reform necessary

The United States should come up with a reform proposal for the International Monetary Fund, Mr. Krause said, because it would be to this nation's advantage. The dollar is still at the center of the international monetary system, and if the United States makes up the first plan for the system's reform, the final plan is likely to be closer to what the nation wants, Mr. Krause reasons. He warned that if the U.S. does not start working on a plan other financial powers, such as the European Economic Community, might, to this country's disadvantage.

"I think we need a *very* strong IMF," Mr. Krause said. He suggested three changes be worked into the monetary system: 1- changes in currency rates should be recommended to governments; 2- the International Monetary Fund should be able to take steps to change rates; and 3- a special drawing right (SDR) system is needed so that the United States can change the value of its currency when necessary.

Institutional Investors— New Problem for Firms Issuing Common Stock?

Institutional investors of all kinds are going to continue to grow in size and importance, predicts Samuel Krasney Associates. These investors are a force in corporate life that management should be prepared to deal with, the New York based consulting firm advises.

In a position paper, "The Institutional Investor—Friend or Foe?" the firm states, "Now many institutions are an accelerative factor both upon the market and upon individual companies in which they become interested. Other institutions have been politically 'activated' and voted for or against a management position with a 'social consciousness' that often has no regard for the best interests of the shareholders."

Krasney suggests that companies run a shareholder audit, and if more than 10 per cent of a company's shares are in institutional hands it "may be a candidate for trouble." The firm explains, "Many institutions use the same criteria for getting in—and out—of a company's stock. So when one goes, others will probably follow. Institutions have been known to dump corporate shares in a hurry without regard to the effect upon the marketplace."

However, institutional investors provide important balance to the marketplace, are instrumental in channeling large numbers of small investors into a corporation's common stock, and can be responsible for increased volume and liquidity of a corporation's equities, Krasney points out.

A company may not be of interest to institutional investors if its stock is fully priced; if its multiples are higher than they should be; if it is not in a glamour industry; or if it is not in a turnaround situation, Krasney states.

"You must be prepared to understand that it is as important as any other part of operations for

your corporation to set up a program to compensate for shifts that institutional investors can introduce into the marketplace for your corporation's equities," businessmen are advised. "Your investor relations program must encourage direct investments by individuals and, at the same time, evolve a program to insure a reasonable amount of market equilibrium," the consulting firm asserts.

Krasney suggests two steps be taken: First, "know your shareholders—and make sure your shareholders know you," Krasney counsels. Second, "maintain an internal program for communications with institutional representatives and security analysts."

Institutional investors own more than \$200 billion in investment capital and can control up to 70 per cent of the daily trading volume of the New York Stock Exchange and more than 40 per cent on the American Stock Exchange.

"Any corporate management ill-prepared to deal with these key investors on a realistic and sophisticated basis will be undermining its own position and doing a disservice to its company shareholders," the consulting firm concludes.

GE Markets New Business Opportunity Newsletter

General Electric Company is into the business of publishing information about new product opportunities that are available for licensing or sale from GE or other U.S. corporations. It is now selling a booklet listing over 200 high-technology business opportunities.

The booklet, *New Product/New Business Digest*, costs \$50 in the United States and \$70 abroad, with a 10 per cent discount for cash payment.

The *Digest* describes products, patents, and new programs that have been partially or completely

developed. Some of the subjects discussed are chemical specialties, current product lines, pollution monitoring, sensors and detectors, and software.

New Product/New Business Digest is an offshoot of GE's *New Business Opportunities*, a bimonthly publication that costs \$185 per year inside the United States, \$235 outside.

Readers of either GE publication may obtain more extensive descriptions and details of licensing upon inquiry.

Both publications can be ordered from the General Electric Company, Business Development Services, Dept. H, Bldg. 5, Room 309, 1 River Road, Schenectady, N.Y. 12345.

A similar sort of publication, *New Product Newsletter*, was reported on at length in the September-October, 1970, issue of this magazine. See "Cash for Red Ink Divisions," page 46.

Iowa Uses Computer To Project School Costs For All Local Districts

Iowa is calculating its school tax rates and state aid to schools with the help of a computer. During the last session of the State Legislature, 52 tax aid proposals were given detailed analysis via electronic processing.

With computer assistance, the Legislature was able to project costs in each of Iowa's 453 school districts over five school years. It was able to predict what a change in the local school tax rate would mean for any district during that time period.

Stored in the data bank were total assessed valuation, school district budgets, current and projected enrollments, and taxable income.

A foundation formula was used in determining school aid. After a rate of two cents per tax dollar is levied in each district, the state

pays the district up to 80 per cent of Iowa's average cost per pupil in school aid. The computer calculated tax revenues and school operation costs for each projected year. An IBM System/370 Model 155 was used.

Iowa Comptroller Marvin R. Selden, Jr., said, "We got to know what would and what would not work after a time by examining a proposed change rather than entering it into the computer. We gained a knowledge base from the previous inquiries we made of the system. The result was that the staff became quite knowledgeable."

Property owners in Iowa are paying the same taxes for the 1971-72 school year as they did for the 1970-71 school year. "I don't know if we could have given the people of Iowa that kind of help if we hadn't used data processing," Comptroller Selden said.

Model Railroad Builder Uses Computer To Predict Customer Wants

Athearn, Inc., builds and sells half-a-million railroad cars and engines every year. Though railroading is big business, this is small business, miniature in fact.

The company is utilizing a computer to give it exact sales and inventory information. Athearn has 800 different train models built precisely to scale 1/87th actual size.

Irvin Athearn explained that with the use of the IBM System/3 Model 6, "we can get more complete reports about our customers' preferences and streamline our production and shipping schedules."

The tiny railroad uses its computer system to record all details of incoming customer orders as well as daily figures on each model produced in the shop. As orders are filled, inventory records are adjusted and computer-produced reports tell shipping department employees where to send the models.



Computer helps determine daily production runs of 800 different car and engine models made by Athearn, Inc., by predicting customer demand level for each model.

When an order is not filled completely, a report is generated so that missing models are shipped as soon as they are manufactured.

To produce the miniature cars blueprints and photographs of the real cars must be obtained. Then dies have to be built. The Athearn designers also obtain exact color swatches so that the paint and lettering on the miniatures will be faithful reproductions of the larger cars.

"Tooling costs for each one may reach \$60,000," Mr. Athearn said, "so it's important for us to choose models that will sell. We expect the computer reports, showing hobbyists' past preferences for certain models, to guide us in introducing new cars to our line."

Wisconsin Monitors Water Quality by Remote Sensors

Wisconsin is combating water pollution with the assistance of a computer. The state is maintaining a 24-hour-a-day surveillance of water quality in the Fox and Wisconsin Rivers. State officials believe the water in the two rivers is cleaner today than it was ten years ago.

Thomas G. Frangos, administrator of the Wisconsin Division of Environmental Protection, explained, "Evaluating the quality of water is a very new discipline. We need as much information as we can get. To gather this information without a computer is highly impractical. For example, it is impractical to send technicians to some remote river location at three in the morning to get a water sample. The computer does it for us at any time, is efficient, fast, and accurate."

"Because we get 24-hour surveillance, we feel we have some solid documentary evidence to support our orders to correct processes that are polluting the waters," Mr. Frangos said.

Remote sensing devices at 11 locations on the Fox and Wisconsin Rivers transmit, on demand by the central computer in the state capital, measurements of dissolved oxygen, temperature, pH, and conductivity in both rivers. In the Fox River, turbidity is also measured.

The measurements are transmitted over telephone lines to an IBM System/370 Model 155. The Wisconsin Department of Natural Resources has a satellite computer, a System/360 Model 20, that is used to print accumulated monitoring data stored in the Model 155.

Wisconsin also uses a mobile lab that collects water quality data and 39 stations where water samples are manually collected.

Cleanup orders issued

A number of "cleanup" orders have been issued by the Department of Natural Resources to various industries and municipalities situated along the rivers.

Quick determination of the effects specific control measures might have can be made with a computerized mathematical recreation of a portion of the Fox River. For example, were organic discharges to be reduced a small percentage, what bearing would this have on dissolved oxygen?

Division Administrator Frangos

said, "We are still in the embryo state of trying to understand causes and effects of various water pollutants. It is a complex science and one that demands the computer's versatility."

Business 'Preventive Medicine' Program Marketed by Searle

A preventive medicine program for businessmen has been introduced by G. D. Searle & Co., Skokie, Ill.

"Project Health" is a self-motivational program of films, books, and written examinations to teach people how to deal with the dangers of heart disease, cancer, alcoholism and drug abuse, physical unfitnes, obesity, respiratory illness, and mental stress, Searle states.

The eight-part course was produced by MEDCOM, Inc., New York, based on the research of 138 medical specialists, Searle explains.

Robert H. Moore, president of Searle Educational Systems, said that few companies realize how much money a complete program of health education can save in less expensive insurance coverage and increased employee productivity and longevity.

He noted that industry-wide studies have shown it costs \$4,000 to replace a first-line supervisor, \$15,000 for a middle manager, and \$28,000 for a high-level executive.

"At those costs," Mr. Moore concludes, "management should realize it can't afford to lose an employee because of poor health."

Project Health is designed to take one hour of company time per month. Some of the programs in the package are: "The Fat of the Land," "The Pressure Principle," and "Ashes to Ashes."

Dr. Robert E. Fuisz, Project Health publisher, said, "The businessman will literally learn how to survive within the corporate structure."

GE Time Sharing Network Adds New Features

General Electric has added new system controls and programing capabilities to its time sharing network.

Two new capabilities the General Electric Network offers business users are "journalization" and "file sharing."

"Journalization" automatically records transactions as they occur on disc or tape in real time. Once written, it is the equivalent of a carbon copy of the transaction; the information cannot be altered. GE believes this capability provides better reliability assurance for users who depend on the network to process and coordinate vital data, such as sales orders.

"File sharing" allows any authorized network file user to put data in his company's file or read data out at the same time the file is being used, from another location, by someone else in the company.

More operations automatic

GE says it is maximizing operations done automatically by the computer and simplifying operator interaction. GE has designed more than 15 new commands to work within running programs and enable the user's designers to build greater sophistication into its programs. For instance, "SLEEP" and "WAKE" programing modes allow users to place different programs in a standby mode. Also a package of "subscriber controls" is available which can limit system access, assign new billing numbers, or order programs to execute automatically at a terminal after sign-on.

Another new GE option is "archival storage." With one command from the user terminal files can be stored off line on magnetic tape. Any file can be returned on line overnight, GE states.

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IN THE
DARK...



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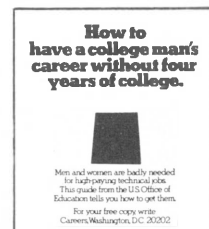
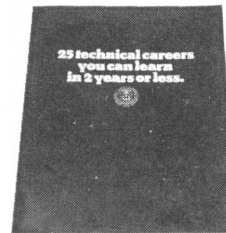
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Foundries traditionally use cost per pound in setting up their budgets. This is convenient but quite unreliable if product mix varies sharply. The author suggests using time and unit measurements for —

ACCURATE STANDARD COSTS FOR FOUNDRY LABOR AND OVERHEAD

by J. Louis Wargo

Ernst & Ernst

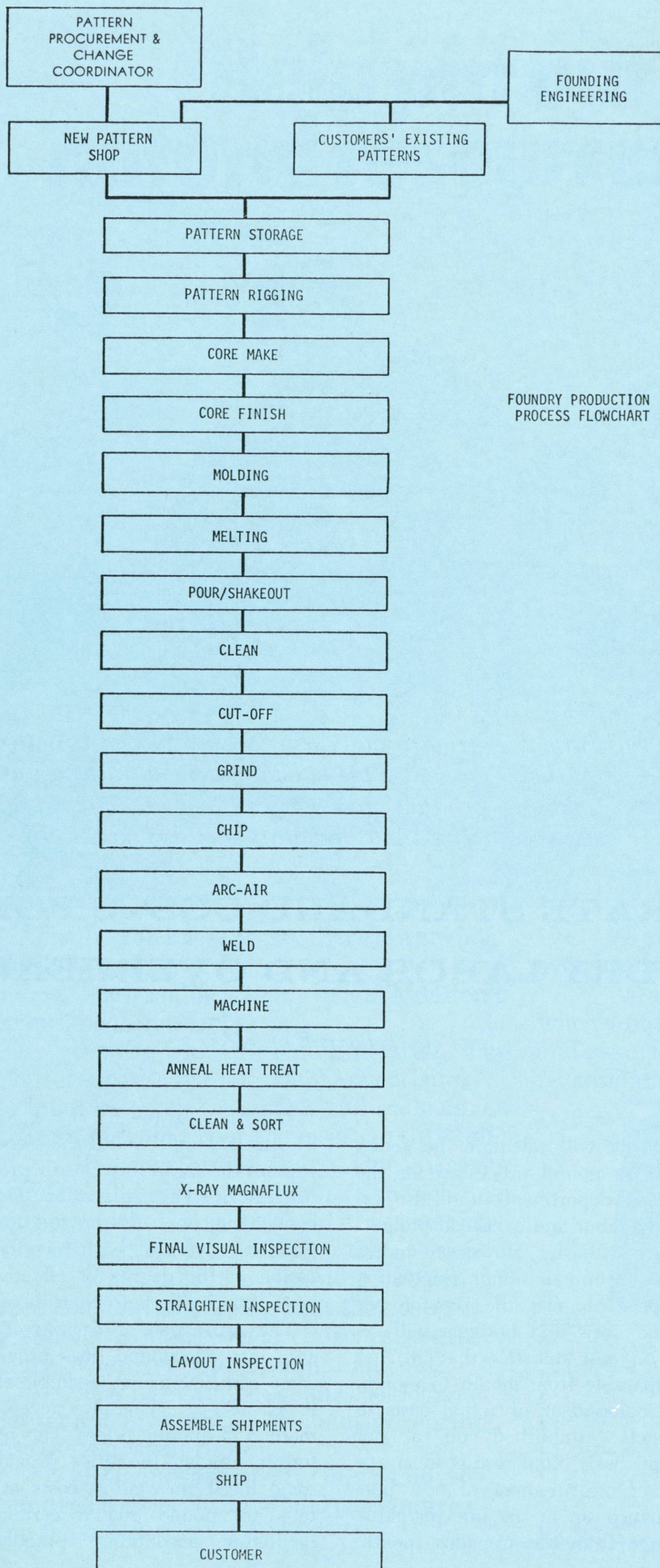
THE PRIMARY purpose of a standard cost accounting system is (1) to assist management in establishing selling prices, (2) to provide a convenient method of valuing inventory, and (3) to provide a means of controlling the cost of operations.

Foundry product costs and prices have historically been expressed in terms of pounds of castings. This general use of a cost per pound appears to have resulted in the misconception that foundry costs are actually incurred at a rate per casting pound. Consequently, many

foundries will calculate the actual cost per pound processed for the various departments and also establish labor and overhead budgets on that basis. However, unless there is only a minor fluctuation in product mix, the use of per pound costs and budgets will result in cost statistics that are not comparable from month to month. The comparison of actual costs to budgets established on a per pound basis often results in an incorrect measurement of cost performance or in an unexplainable change from the previous month.

The usual result would then be to explain the trend in terms of product mix. Such an explanation, while convenient, does not provide operating management with any indication of the degree of effectiveness of their efforts to control costs.

The expression of casting costs at a rate per pound does provide some convenience: it is simple and it is also a generally accepted method of quoting prices. This uniformity among foundries provides some merit for stating costs at a rate per pound and it certainly facilitates accounting practices.



However, the desirability of stating costs on a per pound basis should not preclude the statement of labor and overhead costs in terms that are more meaningful to foundry supervision. This is especially true in establishing standard costs. Realistically, standards for the various operations should be established on a unit of measure, such as pieces or hours. If it is desirable, this standard can then be restated on a cost per pound basis.

In establishing standard costs for labor and overhead, primary consideration should be given to the specific operations that are to be measured and to providing such measurements to foundry supervision. The various foundry operations should be reviewed to determine if casting weight is the most equitable method of establishing standards and generating budgets.

Background

Although castings differ drastically in their size, shape (design), and weight, their production involves the use of similar operating practices. A small intricate casting weighing a pound or less may require the same operations as a large simple casting of 1,000 pounds. These essential operations are pattern making, melting, sand mixing, molding, core-making, cleaning or finishing, and heat treating. The operations performed on these dissimilar castings may be comparable, while the facilities and the operating time (and thus the cost) may differ drastically. For example, molding facilities may include bench molding, sand slinging, or shell making; core-making may include core-blowing, manual core-making, or core assembly; cleaning may include burning, chipping, grinding, shot blasting, or fumbling; heat treating may include an annealing furnace, oil quench, or special heat treatment. Various combinations of these possibilities can be involved in the production of a casting.

Since most foundry cost accounting systems are not designed to

provide the cost of each of these operations, an average cost of all castings produced is frequently used. With the wide variations in the physical dimensions of castings, weight was selected as the common denominator. The rationalization of the use of an average cost per pound was that casting costs that were overstated would be offset by casting costs that were understated. As long as customers' orders reflected a constant product mix this theory would hold up. With the competition in the industry, however, specific foundries have found that they are obtaining unprofitable orders and are losing the profitable orders.

Alternatively, production of small complex castings that may be marginally profitable when done in conjunction with the production of large simple castings becomes definitely unprofitable if the demand for the larger castings ceases, while production must go on with the smaller units.

In making this cost determination it will be generally established that another unit of measure, such as time or pieces, is more important than cost per pound to various areas. For example, in the melting furnace area the department head is mainly concerned with furnace hours and pounds of hot metal produced. Similarly, the core-making supervisor is concerned with the number of cores that are produced; the molding supervisor is concerned with molding equipment hours and flasks molded; the heat treating supervisor is concerned with furnace hours and the number of castings heat treated; and the sand mixer supervisor is concerned with

EXHIBIT I

Example:
 Cost Center 0100—Electric Furnace
 Budget Determinant: Furnace Operating Hour
 Normal Per Month: 519 Hours (3 shifts, 5 days/week)

CODE	EXPENSE DESCRIPTION	UNITS PER FURNACE HOUR	DOLLARS PER UNIT	STANDARD COST PER FURNACE HOUR
101	Direct Labor	5.0 hours	\$4.40	\$ 22.00
102	Indirect Labor	3.0 hours	3.20	9.60
200	Fringe Benefits	8.0 hours	1.275	10.20
300	Operating Supplies	—	—	14.30
400	Utilities	—	—	22.00
501	Maintenance Shop Labor	1.00	8.60	8.60
502	Maintenance Material	—	—	4.30
600	Lift Truck Service	—	—	7.00
700	Locomotive Engine Service	—	—	4.00
801	Laboratory Service	—	—	8.00
809	General Expenses	—	—	15.50
TOTAL				\$125.50

the number of batches produced.

These department heads are only indirectly concerned with the weight of the castings to be produced as a result of their individual efforts. Accounting data, especially standard costs, for these areas should be expressed in a manner that is readily interpreted by the head of the department that is being measured.

Dollar rates

To the extent practicable, standard cost rates for labor and overhead should be stated and budgeted as the cost of utilizing men or equipment for a given time period or as the cost of producing a specified quantity of product or other measurable items. Such a standard would, for example, indicate the cost to operate a melting furnace for an hour, the cost to produce 100 specified cores, the cost to operate a sand mixer for an hour, the cost to operate molding equipment for an hour, or the cost to grind or finish 100 specified castings. These labor and overhead standards should detail to the extent desirable the various elements of labor and overhead. See Exhibit I, above.

Standard cost rates should similarly be established for the various cost centers on the basis of the most applicable budget determin-

ants. The recommended method of developing such standard overhead rates is the demonstrated best method for a representative period.

Prior to developing overhead standards, it should be established that the reporting of the actual quantities is readily available for the preparation of performance reports. The availability of actual quantities for generating monthly standard cost budgets can be readily determined by a review of the present reporting system. Usually these quantities are being reported for payroll incentives, quality control, production control, inventory control, or departmental efficiency or control purposes. In those cases where data are not currently available, present reports should be revised to include such quantities. A list similar to Exhibit 2, on page 22, should be prepared to determine that the necessary information will be available for all cost centers.

The use of labor and overhead standards based on a unit of time requires the establishment of a production standard in order to convert these standard costs to a standard cost of producing a casting. Production standards are time allowances to produce or process a specified number of units, pounds, or pieces. These quantities should be related directly to the specific



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casting. Some examples of this are shown in Exhibit 3, below.

Production standards should be stated in terms of elapsed time, as compared to payroll incentive times, so as to eliminate the calculations required to convert to real time and to facilitate a comparison to actual time. This is es-

pecially true in those areas where standard overhead cost rates have been established on the basis of machine or equipment hours instead of labor hours, e.g., melting furnace, heat treating furnace, molding hour, etc. For areas such as these that also have varying crew sizes it is difficult to have a

common denominator other than elapsed time for production standards.

Incentive time standards generally result in "earned man hours" in excess of the actual hours worked with labor performances expressed accordingly. Under such incentive plans it is not unusual for employees to "earn" ten or more hours per eight hour working day. Since "earned man hours" must be converted to obtain loan standards, the use of production standards based on elapsed time will permit a projection of the production volume necessary to attain a specified production performance. This will facilitate the development of effective production and inventory control techniques.

EXHIBIT 2

COST CENTER		BUDGET DETERMINANT	PRODUCTION STANDARD	SOURCE
NUMBER	DESCRIPTION	DESCRIPTION		
0100	Electric furnace	Earned* furnace operating hour	Pounds of hot metal poured	Melting furnace report
0210	Core-making	Earned man hour	Cores produced by core number	Incentive report
0320	Shot blaster	Earned shot blaster operating hour	Castings blasted by pattern number	Inspection report

* An earned hour is the time required to perform the necessary operations or produce a specified quantity of product.

EXHIBIT 3

COST CENTER	STANDARD DOLLAR RATE LABOR AND OVERHEAD	PRODUCTION STANDARD
Melting	Standard furnace operating hour	Pounds of Hot Metal/Hour
Molding	Standard molding equipment operating hour	Molds/Hour
Core-making	Standard man hour	Cores/Man Hour
Shot blaster	Standard shot blaster operating hour	Casting Blasted/Hour
Finishing	Standard grinder man hour	Man Hours/Casting

EXHIBIT 4

Example of Production Standards:
Cost Center: 0230 Molding

PATTERN NUMBER	PART NUMBER	WEIGHT PER CASTING	STANDARD RUN SIZE	EFFECTIVE DATE		
				HOURS/ PER SETUP	HOURS PER PIECE SETUP	HOURS PER PIECE RUN
BE 165	3012-6021	82.5	350	1.50	.004	.158
BE 168	3012-6022	52.5	500	2.48	.005	.086
BE 179	3012-6023	50.5	500	2.47	.005	.094
BE 189	3012-6024	62.0	400	2.53	.006	.156
BY 140	3022-6121	61.5	400	2.51	.006	.160
BY 145	3022-6122	57.5	350	2.55	.007	.164
BY 155	3022-6123	57.5	350	2.59	.007	.168
BY 160	3022-6124	66.5	450	3.19	.007	.170
BZ 110	4012-1001	67.0	450	1.48	.003	.160
BZ 112	4012-1002	41.0	500	1.56	.003	.180

Source of standards

Production standards can be based upon incentive standards, other time study data, historically developed data, or even estimates. These standards may include an allowance for setup time where applicable or separate setup standards may be established. The principal advantage of a combined rate including run time and setup time is simplicity. Since the standard time is combined, it is unnecessary to report the actual time separately. The separation of run time and setup time will provide a means of measuring the performance of both areas and thus enhance the control of both areas. Inclusion of setup time with the production or run time standards may be done on a percentage basis or it may be a separately developed rate that is merely added to the production time. A specific setup time standard requires the establishment of a standard run size, so that the related costs can be expressed on a per piece basis. An example of production standards is shown in Exhibit 4, at the left.

The establishment of production standards not only enables the development of standard product costs but also facilitates the preparation of costs performance re-

**EXHIBIT 5
STANDARD PRODUCT COST**

Casting Weight: 825
Run Size: 350

Part Number: 3012-6021
Engineering Part Number: BE 165
Part Name: Manit

COST CENTER CODE	DESCRIP-TION	WEIGHT OR MACHINE NUMBER	INCENTIVE STANDARD*	INCENTIVE TO ACTUAL FACTOR	STANDARD UNITS	CHARGING RATE	STANDARD COST
	Material	111.0			1.8270	.019	\$ 3.82
	Scrap credit				.7770	.018	1.43 Cr.
	Net material						2.39
0220	Sand mixer	966	5.167	.865	4.469	13.20	.59
0210	Core room	117	30.667	.843	25.852	10.40	2.70
	Setup	117	.667	1.409	.940	7.20	.20
0230	Molding	104	15.833	.805	12.745	17.30	2.21
	Setup	104	1.500	.927	1.391	9.30	.37
0100	Electric furnace	109	11.000	.754	8.294	125.50	9.87
0310	Grinding	114	11.667	.816	9.520	8.40	.79
0320	Shot blast	106	3.333	.786	2.620	17.60	.45
0330	Cleaning	978	10.000	.801	8.010	17.80	1.42
0410	Testing	113	5.500	1.000	5.500	11.20	.61
	Setup	113	.667	1.000	.667	7.10	.13
					TOTAL COST PER CASTING		\$21.73
					TOTAL COST PER POUND		\$.263

*Run time standard per 100 pieces. Setup standard per setup.

ports. A typical product cost for a casting might appear as in Exhibit 5, above.

Performance reports

The use of production standards permits the preparation of production performance reports that compare actual times with standard times. These comparisons can be by cost center, product group, or individual castings. The degree of refinement is dependent upon the detail in which actual times are available. Since standard times are related to specific castings that are usually identified in detail, reports can be prepared by shift, day, week, or any other time period. Typical performance reports might appear as shown in Exhibit 6, at the right.

Summary

The principal advantage of stating labor and overhead costs and budgets on a per pound basis is convenience. It is also a relatively simple method that spreads costs over a broad common denominator. The expression of standard costs for finished castings on the same basis is desirable; however,

such costs should be derived from a more specific budget determinant, such as machine hours, and then converted to an expression per pound. This will permit the development of flexible budgets and product costs that more closely approximate actual costs. Such an approach requires the establishment of production standards to enable the conversion of dollar standards

per unit of time to standard costs per casting. The use of production standards will facilitate the calculation of flexible budgets that are directly related to actual production and the preparation of reports for such flexible budgets. Use of these reports and standards by the management accountant will enable him to function more effectively in the management of the foundry.

EXHIBIT 6

PRODUCTION PERFORMANCE

Plant: Cleveland		Week Ending: 11-30-71			
COST CENTER		PER CENT PERFORMANCE	STANDARD HOURS	ACTUAL HOURS	VARIANCE HOURS
0100	Electric furnace	104	119.6	115.0	+ 4.6
0210	Core-making	95	760.0	800.0	-40.0
0220	Sand mixer	97	116.4	120.0	- 3.6
0310	Shake out	100	120.0	120.0	-
0320	Hand chipping	105	420.0	400.0	+20.0

PRODUCTION PERFORMANCE

Cost Center: Molding		Week Ending: 11-30-71				
PATTERN NUMBER	PART NUMBER	QUANTITY	STANDARD	ACTUAL	VARIANCE	PER CENT PERFORMANCE
BE 165	3012-6021	400	63.2	55.0	+ 8.2	114.9
BE 168	3012-6022	500	43.0	40.0	+ 3.0	107.5
BE 189	3012-6024	500	78.0	75.0	+ 3.0	104.0
BY 145	3022-6122	300	49.2	52.0	- 2.8	94.6
BY 155	3022-6123	450	76.0	70.0	+ 6.0	108.5
BY 160	3022-6124	400	68.0	65.0	+ 3.0	104.6
BZ 112	4012-1002	500	90.0	88.0	+ 2.0	102.0
		TOTAL	467.4	445.0	+22.4	105.0

Everyone agrees on the necessity for pollution control; nearly everyone disagrees on how to pay for it. A Pollution Control Information System that gives facts leading to the maximum amount of control for the lowest cost is suggested —

POLLUTION CONTROL: A FRAMEWORK FOR DECISION MAKING AND COST CONTROL

*by Belverd Needles, Jr., James C. Caldwell, and Doyle Z. Williams
Texas Tech University*

ALTHOUGH the social implications of the actions of American business have for some time been the subject of public attention, there are clear indications that we are entering an era when this attention will be intensified. The public's attention in the increasing social responsibilities of business is, perhaps, best exemplified in the issues of preserving the environment and controlling pollution. Clearly, the efforts of accountants are essential as business seeks to meet its increased social responsibilities of pollution control in a competitive economy.

The leaders of the accounting profession have acknowledged the obligation of accountants to contribute to an effective solution to the pollution control problem. Louis

M. Kessler, past president of the American Institute of Certified Public Accountants, has said that businessmen and accountants must become involved "not because their creativity and productivity helped bring about the problem but because they possess the prestige and influence, the skills and talents to turn this country's proficiency for making tangible goods to the preservation of intangible values in our physical environment."¹

In sum, those responsible for monitoring the financial health of an enterprise must have a firm grasp of the dimensions of the is-

ssues surrounding the control of pollution and the related costs.

This article seeks to present a Pollution Control Information System (PCIS) which identifies the internal and external constraints and critical decision points in handling the problem of pollution abatement. It suggests alternative methods of pollution abatement and examines the appropriateness of traditional accounting techniques in evaluating these alternatives. Finally, it provides a framework for developing a pollution control monitoring system.

The term "pollution" does not have a simple definition. It is usually associated with such terms as "undesirable," "unfavorable," or "obnoxious." The Environmental Pollution Panel of the President's

¹ "Pollution Control: How Much Will It Cost?" *Management Accounting*, July, 1970, p. 82.

Science Advisory Committee defined pollution as follows:

Environmental pollution is the unfavorable alteration of our surroundings, wholly or largely as a by-product of man's actions, through direct or indirect effects of changes in energy patterns, radiation levels, chemical and physical constitution and abundances of organisms.²

Another way of viewing pollution is through the concept of "disproduct." Disproducts are the negative services which are generated by the same processes which create products. Noise is an undesirable result of airports; smog is an undesirable result of cars, industry, and other activities. Residual waste or pollution is an inevitable part of the process of production. In most analyses, this disproduct is ignored. Disproducts are not unusual results of production but are a normal and inherent part of the process; they become more important as the population and output increase. For this reason, the problems of pollution cannot be treated as isolated problems such as clear air or water, but must be related to the production processes which gave rise to them and to the products which were also created.³ It should be observed that the term "final" consumption is a misnomer. All output eventually becomes waste⁴ and is recycled into the system in one way or another. It either goes into the environment for eventual decomposition and reuse by the ecological system or is recycled directly back into the production system.

²Environment Panel of the President's Science Advisory Committee of *Restoring the Quality of Our Environment*, The White House, Washington, D.C., November, 1965.

³For a detailed exposition of this subject, see Robert U. Ayres and Allen V. Kneese, "Production, Consumption, and Externalities," *The American Economic Review*, June, 1969, pp. 282, 297.

⁴Disproduct, waste, non-useful products, and pollution are used interchangeably in this article.

A Pollution Control Information System is presented in Exhibit 1, page 26, and consists of three phases. Phase I is the pollution abatement decision process. Phase II is the evaluation of alternative processes which occurs once a decision has been made to take some action toward pollution abatement. Obviously, these two phases are highly interrelated, but it is convenient to view them separately here because of their unique information requirements. Phase III is the establishment and maintenance of a pollution control monitoring system which provides feedback into various components of the PCIS.

The decision to seek to control pollution and determination of the extent of the controls is a complicated one. Traditional economic theory suggests that a firm, in order to maximize income, should produce at a level where marginal costs equal marginal revenue. This concept is clearly inadequate when considering pollution because there is no easily measured benefit from additional expenditures on pollution control.⁵ In fact, in many instances the less a company spends on pollution control the more its income will be, except in the very long run. For instance, consider a company which produces widgets and which disposes of the waste and smoke from production into a river and into the air. It has the alternative of processing the smoke and waste before disposal to prevent pollution or not to process further. The gross profit per widget under each alternative might be as follows:

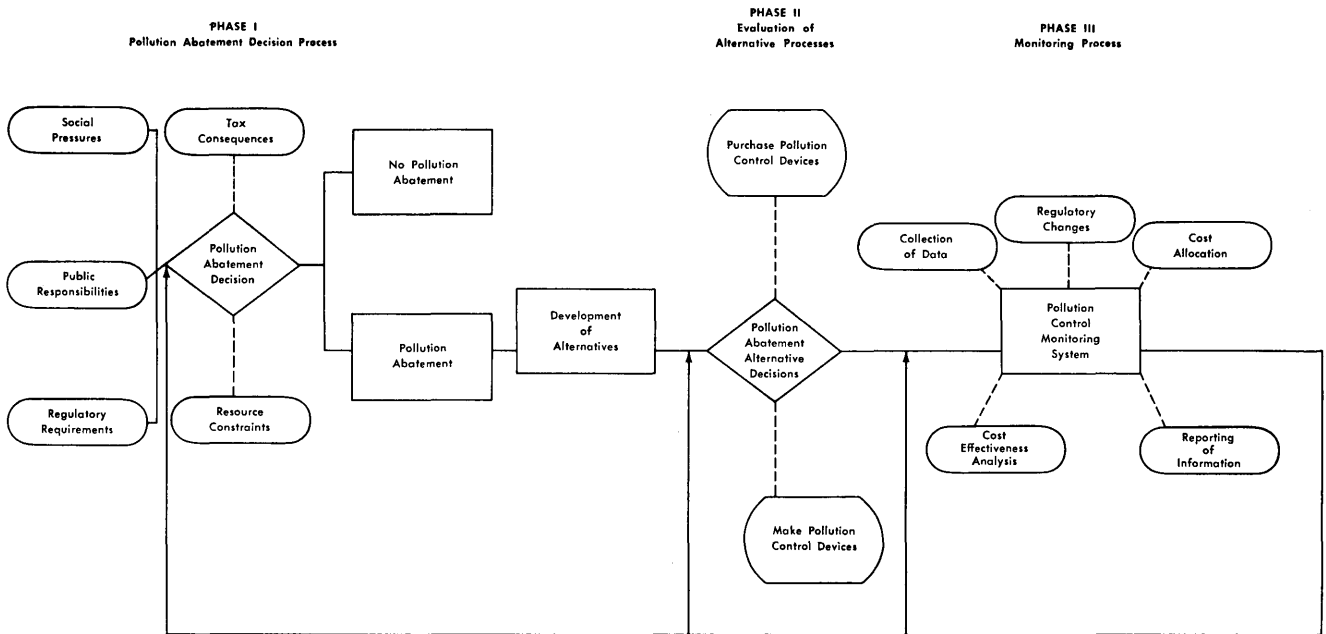
	No Pollution Control	Pollution Control
Sales Price	\$10.00	\$10.00
Less:		
Manufacturing Costs	6.00	6.00
Costs of Pollution Control	—0—	1.00
Gross Profit	<u>\$ 4.00</u>	<u>\$ 3.00</u>

Clearly, under these circumstances if the company wishes to

⁵Some returns may come from sales of by-products or from the recycling process.

Another way of viewing pollution is through the concept of "disproduct." Disproducts are the negative services which are generated by the same processes which create products. Noise is an undesirable result of airports; smog is an undesirable result of cars, industry, and other activities.

EXHIBIT I
POLLUTION CONTROL INFORMATION SYSTEM



maximize profit at the prevailing market price, it should not initiate the pollution control, thereby passing the cost of the disproducts on to the public. Further, if this company is in a competitive market and if its competitors have pollution control processes but it can get by without them, then this company can undersell (say, at \$9.00 per unit) its competitors and increase sales and profits at the expense of more pollution.

Competition and pollution

In either case, without the pollution controls, the company's costs may increase indirectly by additional taxes which are necessary because the government must now spend more for pollution controls. However, this increase in taxes would be borne by companies who install pollution controls as well as by those companies which by the nature of their businesses do not cause pollution. As one can see, competition, which is a strong incentive for producing better products at lower costs, can contribute

to pollution. A company's costs are lower if it can pass the job of cleaning up to the consumer; consequently, it has a competitive advantage over companies that practice pollution control. Ultimately, the cost (benefit) to society as a whole of pollution (controls) must be measured and there must be tax incentives or penalties built into the economic system before the traditional economic models are applicable.

Thus, if one excludes the possibility of waste processing becoming profitable, as when a new use is found for it, there are three forces which independently or together cause a company to consider the possibility of increasing its pollution control efforts. These three factors are a sense of social responsibility, public pressures, and regulatory requirements. Two secondary factors are resource constraints and tax considerations.

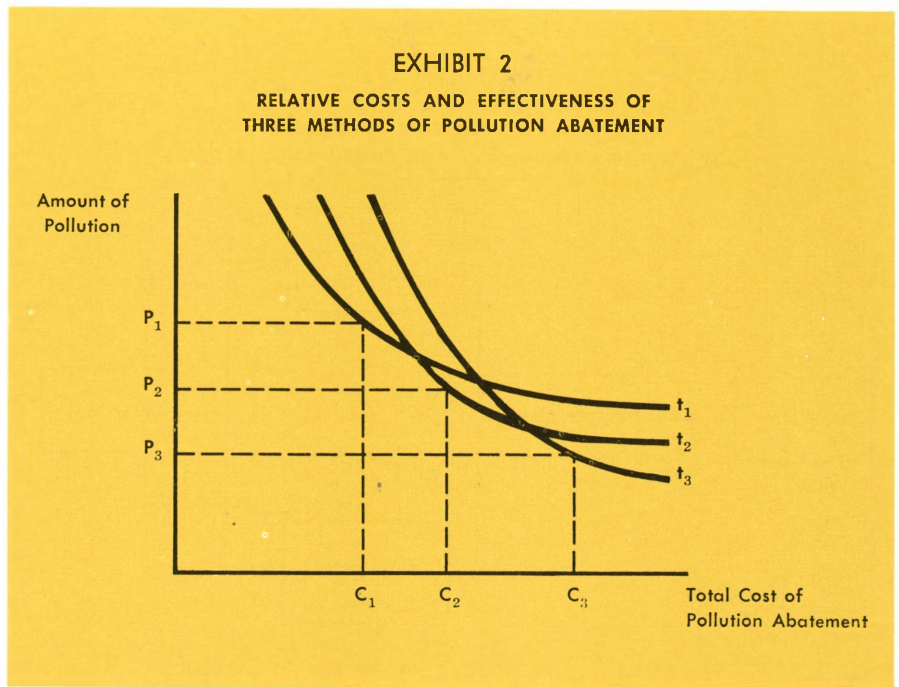
Social Responsibility. No one likes or desires pollution and no one wants to be known as a polluter. Many companies, therefore, decide to instigate pollution con-

trols simply because they feel that it is part of their social responsibility to do so. Unfortunately, because of competitive factors and lack of awareness of the problem, pollution in many industries has not been controlled adequately in the past.

Public Pressures. In addition, the public's unwillingness to pay higher prices for pollution control contributes to the problem. The public mood, however, has changed over the last five years. Concerned citizens are attempting to buy products from companies which are seeking to reduce pollution or produce products which cause less pollution than competing products. In some instances, the public is boycotting some businesses, fighting certain public projects, and lobbying for more legislation. Financial strategists of business must be aware of these movements for they provide vital input to the decision process. They limit alternatives and provide time constraints on the implementation of pollution control systems. Companies must provide a mechanism such as a

committee of management which meets regularly to assess continually its own position, as well as the mood of the public.

Regulatory Requirements. The third major factor in pollution control analysis is the influence of government regulation. The informational needs with respect to this aspect of the pollution abatement decision are becoming increasingly acute because of two basic problems. First, a single company is usually subject to at least two agencies (one for air; one for water) at the city, county, and state levels. Each regulatory body has its own standards, which are frequently in conflict with those of other agencies, and they often compete with each other for jurisdiction. Second, spurred by the public outcry over pollution, government at all levels is toughening and ex-



panding its laws, even those only a year or two old. Every company with a pollution problem should have an information-monitoring process to keep informed of changes in regulations.

Resource Constraints. In making the pollution abatement decision, management is faced with two resource constraints:

1) **Monetary**—There is a limited amount of money to divide among various kinds of pollution controls. Two allocations must be made: Among several means of controlling a particular type of pollution, which should be chosen? Among several types of pollution, how should available funds be allocated?

2) **Technical**—At any one time, there is a given state of technology which is a limiting factor, both from efficiency and cost standpoints. Different methods may have different cost or efficiency characteristics and it is possible that the desired level of pollution removal cannot be reached through presently known methods.

The trade-offs among accepted levels of pollution, costs, and technology can be seen in Exhibit 2, above. Each curve (t_1t_1 , t_2t_2 , t_3t_3)

represents a different method or level of technology which is available. Although in many cases pollution can be eliminated, the cost is usually prohibitive. There must be a compromise with respect to the level of pollution.

If the level of pollution is the constraint, then a level of P_1 , P_2 , or P_3 would result in different methods being chosen. If cost is the constraint, then C_1 , C_2 , C_3 would also result in different control methods being selected.

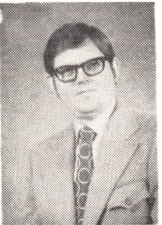
Tax Considerations. Tax considerations are another decision variable in the pollution abatement system. As suggested earlier, it is obvious that if modifications can be made in the competitive system which will encourage pollution abatement, a powerful incentive will exist for pollution control. Two direct means used by state and Federal governments in creating incentives for pollution control are to (1) impose a special tax on people or companies in proportion to the severity of the pollution for which they are responsible (tax penalties) and (2) provide tax credits or other tax benefits such as accelerated depreciation to firms that install pollution control equipment (tax incentives).

Many states as well as the Federal Government have adopted an



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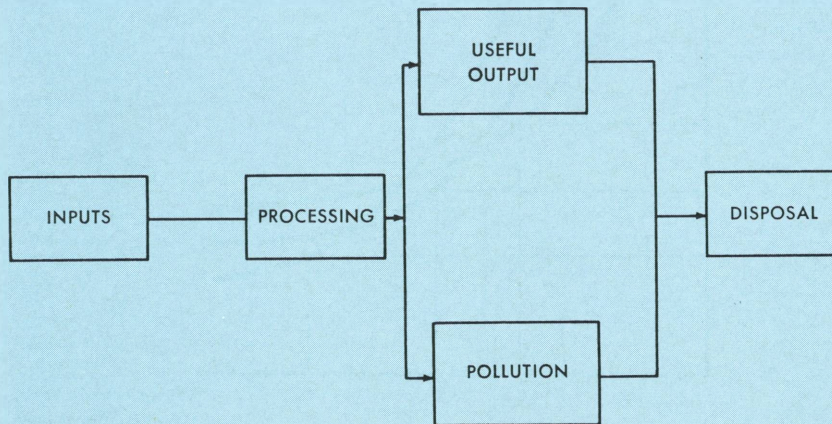


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EXHIBIT 3

A GENERAL SYSTEM OF POLLUTION IN A SIMPLIFIED PRODUCTION AND CONSUMPTION PROCESS



alternative approach for providing tax incentives. Several states exempt air and water pollution devices from sales and use taxes, franchise taxes, and/or property taxes. Many state income tax laws allow accelerated depreciation of pollution control devices. The Federal Tax Reform Act of 1969 allows individuals and corporations to write off the cost of certified pollution control facilities over a 60-month period. On the surface, the providing of tax credits as incentives for installing pollution control devices may appear to be an excellent means for reducing pollution. However, the equity of tax credits is open to question.

First, the size of the tax credit is not related to the reduction in the amount of pollution a particular investment causes but is related only to the number of dollars spent. Second, even though the tax credit system may succeed in reducing pollution, the company which is making the outlay ultimately will not bear the cost. The public will bear part of the costs, because those firms which do not pollute in the first place, and thus need no pollution control equipment, will pay full taxes, while those who do pollute recover a part of their cost through tax credits. To illustrate, a recent study of costs of pollution

control equipment showed that a \$3 million crude oil distillation unit of 37,000 barrels per hour capacity required a vapor control system which cost \$10,000. Another liquid hydrogen unit required a pollution control device which cost \$17,700. On the other hand, a \$250,000 investment in pollution control equipment was required for a \$1,600,000 synthetic rubber operation. An electric precipitator to be used with an open-hearth furnace costs \$150,000 to \$200,000 for the furnace. In some cases, the required investment in pollution control equipment is actually greater than the investment required in the basic equipment.

The alternative method of taxing people and corporations in proportion to the amount of pollution they cause is more attractive. If the tax is high enough to make a substantial difference in cost of production for a polluter versus a non-polluter, companies would have a powerful incentive for installing pollution control equipment and for developing more efficient and economical methods of controlling pollution. The advantages of this method are that it places the burden on the polluter, and, psychologically, it appears to be a penalty whereas the tax credit seems more like a favor. Obviously, one of the problems

with this method is measuring the amount of pollution.

After carefully examining all of the relevant considerations with respect to pollution abatement, management may decide that pollution is not a problem for its company and thus no further action except periodic review is needed. However, if the decision is made that pollution abatement is needed, the next step is to delineate and evaluate alternative ways of pollution abatement.

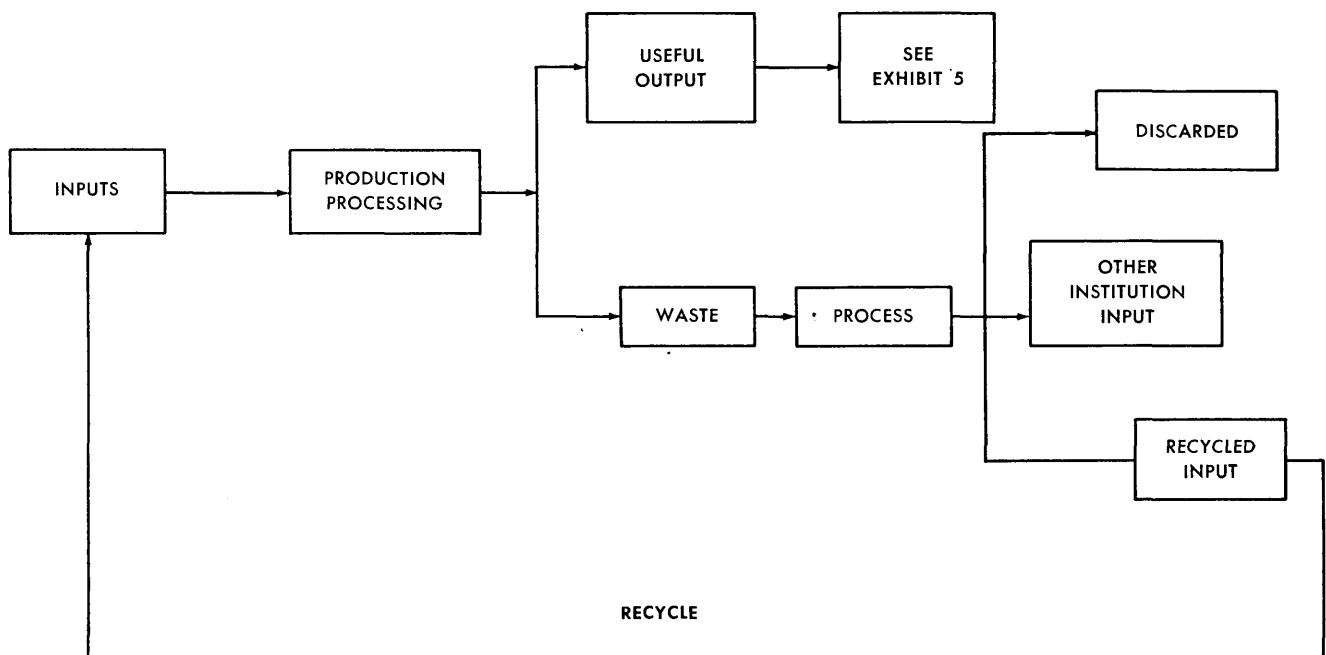
A thorough examination of pollution abatement alternatives requires a structural view of the system of which pollution is an integral part. To illustrate, the system, presented in Exhibit 3 at left, is a simplified version of the production and consumption processes and can represent any entity, whether business, government, or public. The system consists of inputs which may exist in inventory or raw form for industrial production or in product form for a consumer. The processing function may represent production, consumption, or some intermediate step. The output consists of a combination of useful output and waste. The relative amounts of each will vary. For example, in the consumption process, the physical output may be substantially all pollution. On the other hand, in certain efficient manufacturing transformations there may be very little waste. Ultimately, however, from the general systems viewpoint, the output, both the useful and waste portion, must eventually be discarded and/or recycled.

In designing a PCIS, explicit recognition must be given to the alternative processes for controlling pollution. These alternatives include: (1) processing the waste output, (2) processing the useful output, (3) changing the process, and (4) changing the input.

Processing the Waste Output. A common way that all levels of society, whether industry, government, or consumer, have passed on the cost of cleaning up waste to someone else is simply to discard

EXHIBIT 4

POLLUTION CONTROL ALTERNATIVES THROUGH WASTE PROCESSING



the waste. Industry and governments pollute streams and the air; consumers discard trash and drive untuned cars which discharge excess smoke and fumes.

It is obvious, therefore, that the proper processing of waste is an important alternative in its control. Exhibit 4, above, illustrates three alternatives for disposition of waste after it has been processed.

1. After processing, the waste can be discarded. Examples of this type of pollution control are: The cooling of hot water from atomic energy plants before discharge into the water, the treatment of sewage and garbage by local government, the treatment of discharge liquids and smoke by industry.

2. The processing of the waste may transform it into a useful product. Some examples are the sale of sawdust by a sawmill to a pressed board maker and the collecting and converting of sulfur oxides emitted by utility and smelter smokestacks for use in making sulfuric acid.

3. After processing, the waste may be recycled into the system.

Some common examples include the recycling of water or other liquids used for cooling and the collecting of chemicals from smoke for subsequent use.

Processing the Useful Output. As illustrated in Exhibit 5, page 30, another means for controlling the amount of pollution is by further processing of the useful output after its consumption. Exhibit 5 shows the close relationship of useful output to waste. Since useful output becomes waste as soon as it is used, the alternatives after consumption are the same as the alternatives available when processing the waste.

For the industrial firm, however, waste processing is one step removed from waste control. Accordingly, waste processing has special implications, particularly for recycling. The firm or industry must arrange the return of the waste product. Some examples of this system are the use of returnable bottles by beverage manufacturers and the recycling of waste paper and scrap iron.

Changing the Process. Another

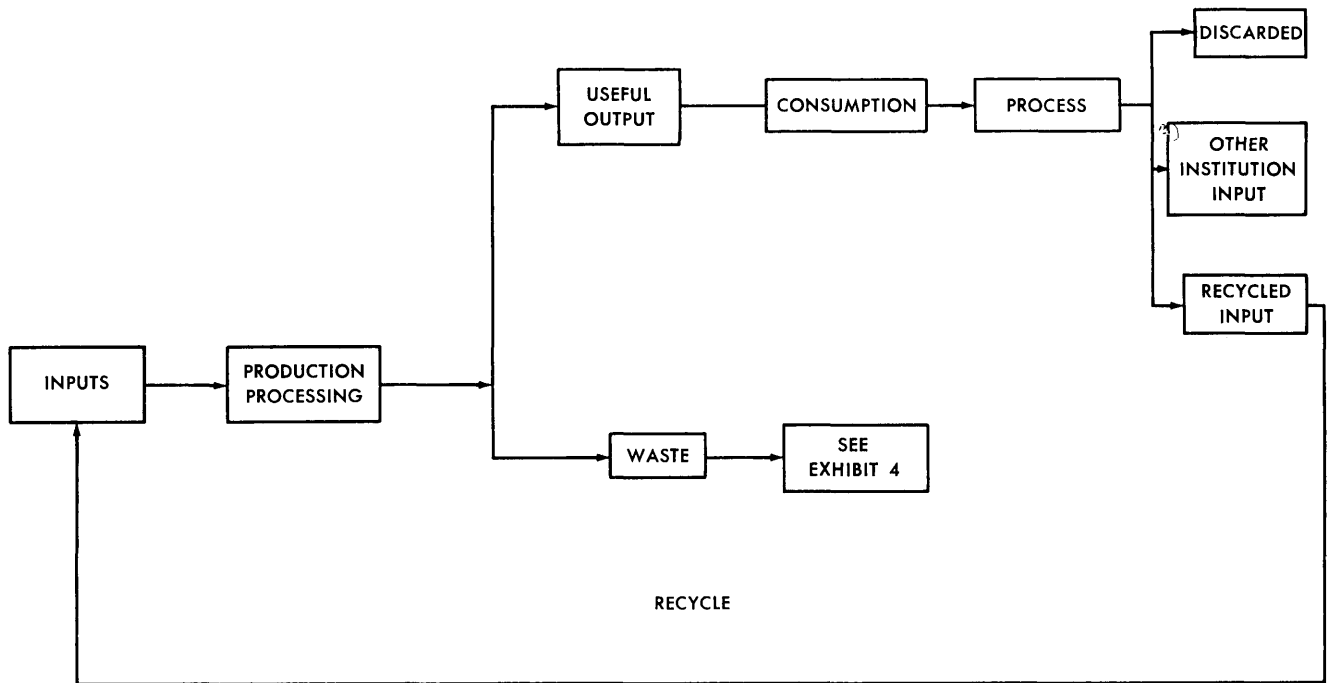
alternative for controlling pollution is to change the manufacturing process itself, resulting in more useful output and/or less waste output. The range of possibilities is large under this alternative and the measurement problems for the accountant are equally great. A company may modify the manufacturing process in such a way that more useful product is obtained or it may manufacture a more efficient product such as a new engine design which emits fewer pollutants than a previous design.

Changing the Input. Finally, pollution may be reduced by changing the input to the system. Some common examples of this trend are: the switching of power companies from highly pollutant soft coal to hard coal and other fuels which cause less air pollution, the development of detergents which are phosphate-free, and the use of different raw materials in plastic containers making them suitable for most incinerators' disposal systems.

An integral part of the decision to embark on a major pollution abatement program includes an

EXHIBIT 5

POLLUTION CONTROL ALTERNATIVES THROUGH REPROCESSING USEFUL PRODUCTS AFTER CONSUMPTION



analysis of the financial resources required. In many instances, the question becomes one of whether the required technology and equipment should be developed in-house, or, if available, purchased externally. Although this type of decision has the earmarks of the familiar "make or buy" analysis, the decision variables are, in some respects, of a different complexity.

For example, in capital expenditure analysis the objective is to measure the profit potential of long-lived assets. The projected profitability of the alternatives depends on (1) the required investment, and (2) the net increase in future cash flows. Under conventional analysis, the project's return is usually determined and compared with the company's desired minimum return. If the projected return is equal to or greater than the minimum desired rate of return and if the other pertinent factors are positive the project is accepted.

However, pollution control projects may not provide returns measurable by conventional methods, and hence will not provide the in-

formation required for conventional capital budgeting models. As *Management Accounting* put it:

. . . if millions must be spent to ensure that this generation is not the last on earth, assurances surely will be required that the enormous sums are spent wisely. For each dollar spent, there should be maximum return in the intangible values gradually disappearing: green forests, fresh air, clear sparkling lakes and streams. Money spent for the abatement of pollution must show tangible reductions in pollution.⁶

In large measure, capital expenditure analysis of pollution abatement must consider returns usually of an intangible nature, not only through preventing loss of clean water and air, but through maintenance of institutional responsibility and goodwill as well.

In addition to the intangible na-

⁶"Pollution Control: How Much Will It Cost?" *Management Accounting*, July, 1970, p. 82.

ture of the benefits of pollution control, a second complication enters into capital budgeting for pollution control projects. The unsettled public attitude toward pollution and rapidly changing regulations, coupled with the absence of a directly measurable benefit stream (either revenue or cost savings), contribute to the unusual uncertainty with respect to the length of any benefits which may accrue from such a project. Clearly, under these circumstances, conventional capital expenditure models must be modified, and in many instances new models developed, in analyzing capital outlays for pollution control.

After the decision has been made to undertake a pollution abatement program, a control system must be designed and implemented. Exhibit 1 (Phase III) presents a monitoring system for collecting relevant data and allocating common costs for the purpose of further cost effectiveness analysis and proper internal reporting.

The pollution control monitoring system should be designed in a

manner consistent with the concept of responsibility accounting. For example, the direct costs for operating the pollution control system can be accumulated and allocated in an equitable manner to those departments or cost centers which caused this expenditure. Those charged with the responsibility of the various departments or cost centers can then determine their controllable cost with regard to pollution abatement and waste disposal, thereby striving to lower these costs while reducing pollution.

However, because of the diverse nature of pollution responsibility, great care must be exercised in designing a responsibility accounting system for pollution costs and assigning such costs to the appropriate cost centers. In some instances, cost responsibility can be readily identified and assigned to a specific center. In other instances, due to the raw material input or the product produced, pollution costs can only be identified at the entity level. Like capital budgeting analyses, conventional responsibility accounting systems may need modification for the purpose of monitoring pollution costs.

Still other modifications in the traditional accounting control systems may be required for application to a pollution control monitoring system.

Coordination essential

Madison C. Forbes, president of Associated Enterprise, Houston, believes that in the past the accounting function has played the dominant role in control systems but in the future the system should be the result of interdisciplinary action. He states:

Formerly, decisions for allocations of cost followed accounting convention and were done almost entirely within the Accounting Department with only a casual reference to the engineering or management requirements of the system. Newer methods of allo-

cation must be a careful blend of accounting, engineering, and management decisions that require not only agreement, but wholehearted cooperation if they are to be effective.⁷

An excellent example of a cost allocation problem arising from a pollution abatement program is the assignment of common costs to products. Allocation of common costs to products raises such familiar issues as accounting for waste, scrap, and by-products. A pollution control monitoring system must provide a means of allocating the common costs in the most meaningful and relevant manner for decision making purposes.

Reporting costs externally

Although it is readily recognized that a chief component of a pollution control monitoring system is reliable and timely reporting of the relevant costs internally, little attention has been directed toward reporting pollution costs externally. As public interest in businesses' social responsibilities continues to grow, and as pollution costs continue to multiply, requirements for external reporting of pollution costs are inevitable. An effectively designed pollution control monitoring system will provide for the capturing, assembling, and reporting of pollution costs to facilitate meaningful external corporate reporting of these outlays.

Finally, a well designed pollution control monitoring system should include provisions for a post-audit of the decisions made through continued cost effectiveness analysis; information should be obtained which will be helpful in evaluating whether the pollution control system is attaining the desired objective. These analyses must include costs for which the accounting process normally does not assign a monetary value. For

⁷Forbes, Madison C., "Cost Accounting for Pollution Control," *Hydrocarbon Processing*, October, 1969, p. 145.

example, a cost must be ascribed to antagonistic public reaction to ineffective pollution abatement efforts.

In summary, designing a Pollution Control Information System is a multidimensional task. First, an analysis of the economic forces of the industry is essential. Determining the potential impact of the absorption of additional costs of pollution controls, although difficult, is of paramount importance. Other variables include an analysis of the firm's social responsibilities, public pressure, and regulatory and tax requirements.

Internal variables of a Pollution Control Information System include resource constraints and available alternative methods for processing waste output.

Like other systems, an effectively designed Pollution Control Information System should include formal evaluation of the relative returns of waste processing alternatives, proper allocation of common costs, timely reporting of relevant data for internal decision making, meaningful external reporting of pollution costs, and thorough post-audits of the decisions surrounding pollution abatement. In many instances, however, conventional techniques of capital budgeting, responsibility accounting, cost allocation, and systems modeling must be modified, and, in some instances, new techniques and approaches developed.

It is readily apparent that because of the wide range of variables inherent in designing a Pollution Control Information System, the interactions of many individuals will usually be required. One strategy is the formation of a task force of, among others, accountants, systems analysts, economists, and engineers working in concert with top management. Such a team committed to the objective of pollution control would be capable of bringing to the task the myriad skills and insights needed to design an effective Pollution Control Information System — a task that is no longer discretionary with business.

Communication—from the top down as well as from the bottom up—is indispensable to the success of a new product or service. Management's criteria and biases must always be clear to R & D —

VENTURING BEYOND THE PASS

by John Walsh

Arthur D. Little, Inc.

WHY DOES one company succeed and another fail in the area of new products or services?

There are, I suggest, two major factors influencing success or failure—management and communications. Does management know where it wants to go and does it make its direction clear to the rest of the company? Are a company's lines of communication open for receiving and developing new ideas and are specially skilled individuals part of the management team—a sort of task force on new opportunities and undertakings?

New venture success requires two approaches. One is methodical, requiring organization and planning. The other is opportunistic, requiring fast response time and flexibility. The company that relies

solely on one or the other will be disappointed.

Let us look at the birthplace of new products. Obviously, a new venture is developed either in-house or from without. But point of origin probably has little correlation with success. What is important is whether the idea lands on fertile soil, and whether this fertile soil is linked to the rest of the organization by open communication channels. Usually there is a great deal of communication from the top down but very little from the bottom up.

One company's experience

Perhaps the best way to illustrate these points is in terms of an actual case history. Let's begin by describing the development of Prod-

uct A which failed to become commercial, followed by a parallel discussion of Product B which became an outstanding success.

Product A was developed in the research and development laboratories of a company. It was given adequate budget, and the development people in charge felt quite sure that they knew management's criteria. The project proceeded very successfully. It was pilot planted and samples were given to the marketing department.

Unfortunately, back at the pass, management did not know what it wanted. It had no clear ideas as to the desired volume of business, level of profitability, or extent to which it was willing to commit its technical, marketing, and management time and resources. Marketing and production were sim-

ilarly uncertain about taking on a new project. In short, no one in the firm had articulated a risk-taking philosophy. While the development group continued to receive encouraging reports of management's enthusiasm, management's actual conversations went something like this: "Here's another new project; the marketing people don't seem to want to press it; the production people find that it doesn't fit with their scheduled plans; the financial department says it's going to lose money for three years."

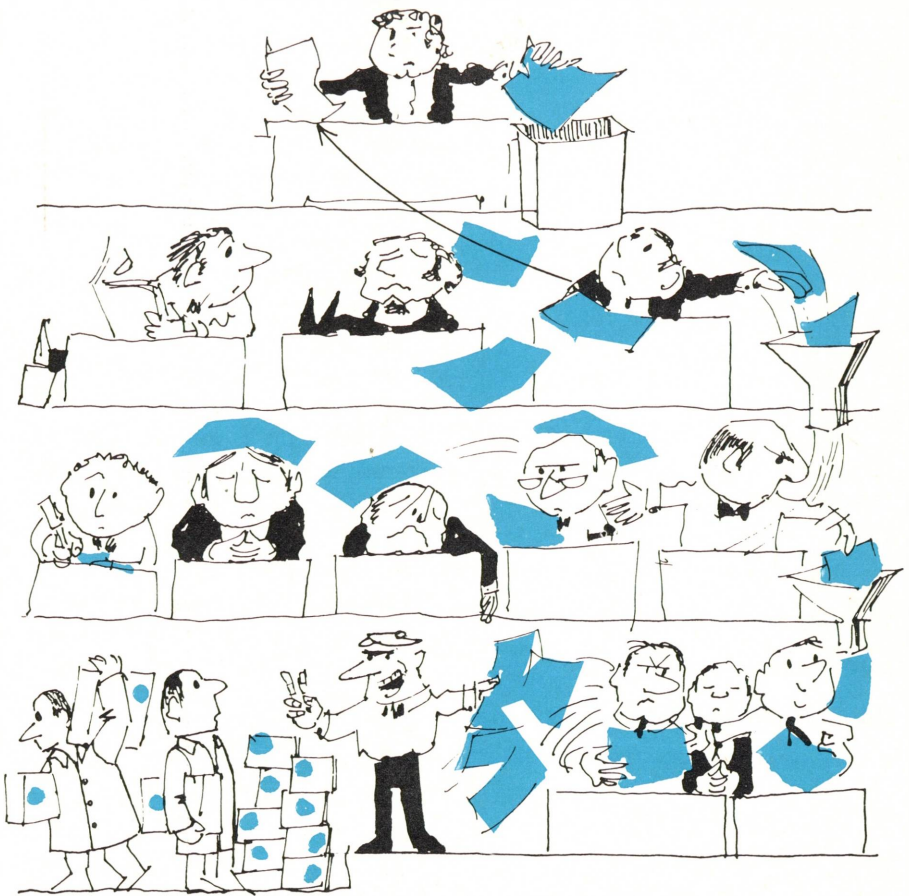
Further lack of commitment was shown by the division managers whose bonuses were in part determined by short-term profits and who were not willing to see some red numbers. To make matters worse, management not only lacked real enthusiasm for the project; it also didn't have the courage to stop it. As a result, money was spent and test marketing done far beyond any reasonable hope of return.

Needless to say, the company finally licensed Product A to someone else, hoping to get a little of its money back. This process left everyone with a very dim view of developing new projects in the future.

A different outcome

The idea for Product B was also developed in a different company's own research and development laboratories. By contrast, however, management had established its criteria, had articulated its risk-taking philosophy, and had told the financial department that money was to be spent for new ventures. In this case, the research and development department took management's criteria into account in developing its idea.

When management committed further money, it was not just to reinforce the status of the R & D department: it was a sincere commitment to go ahead with the project if, indeed, it appeared promising. The technical part of the pro-



A project which the R & D people think has management's firm support all too often has nothing of the kind; management is lukewarm at best and kills the project when it finally reaches implementation stage.

ject went quite well. The marketing department proceeded to prepare the groundwork for the company's entry into the business of distributing and selling the product.

At this point, however, an almost insurmountable obstacle arose. It became apparent that the project would require a far greater amount of capital than the company was willing or able to commit. Management knew, however, that it had a proprietary position. Though it had traditionally avoided joint ventures, it decided to take an opportunistic view and to look for a partner.

The critical factor here was the existence of strong communications. Marketing was talking to production; production was talking to research; research was talking to management. The people at all levels knew what was wanted, and they knew that even though a joint venture violated company tradition,

it *could* be done and would be acceptable.

In the new partnership, the originating company had the product, the imagination, and the risk-taking ability. The other partner had the raw materials and financial resources.

Throughout these and other case histories, the key to success or failure was communication. Too often a project is well conceived and is pushed vigorously, but when it reaches top management, as a request for a budget or approval for a plant, management anguishes for a while and then decides against it. This is a communication problem. Clearly, any project could be stopped much earlier if management didn't want it and let all concerned know it.

Most good projects that fail do so at the very top management level. One company, for example, was interested in diversifying into

One of the easiest and least expensive ways of initiating new developments is for a company to keep lines of communication open with its outside sources. Though many companies scoff at this approach, it is, in fact, productive. For every new venture idea conceived internally, nine are probably thought of by raw material suppliers or customers.

the aerospace industry. It stated there were to be no geographical limitations. When the project finally reached top management, the response was negative. Management said, "Certainly we are not going to support a venture on the West Coast." Obviously, with better communications, management's geographical bias would have been known much earlier in the game.

Another company had a development that was technically brilliant and well developed commercially but ended up as an unwanted consumer item. The board of directors in this case said, "We have no intention of going into a consumer type product." In both cases, a good deal of effort and money could have been saved if management's real criteria had been made explicit.

When ventures fail, you will usually find that R & D developed products which it thought management wanted, but which, in the final analysis, management didn't want at all, or you will find that management thought R & D knew what it wanted. Ask management what it wants from R & D and then ask R & D what it thinks management wants, and you will find two different answers in most cases.

Also vital to the success of any new venture is the recognition of risk by research, management, and marketing. No new venture ever succeeded without paying the cost of entry into the market. This is paid either in R & D money, in advertising money, or in a high price-to-earnings multiplier for acquiring a company which has what is needed in terms of product or marketing. If the financial group is controlling the company and sets an unrealistic return on the dollar spent without recognizing that it costs money to get into the game, most projects will fail. Unless a company is willing to pay the price and sign a chit ahead of time, there is little point in doing new venture and new product research.

One of the easiest and least expensive ways of initiating new developments is for a company to

keep lines of communication open with its outside sources. Though many companies scoff at this approach, it is, in fact, productive. For every new venture idea conceived internally, nine are probably thought of by raw material suppliers or customers.

This approach can be so effective that it should be company policy to take the initiative—to approach suppliers and customers, point out the company's production, marketing, and technological capabilities and ask if they might not be directed to serve the subject's need.

What about the administrative personnel needed to develop profitable new products and services?

First, you need a man capable of recognizing good ideas and of communicating them so as to win management support. This man cannot and should not be asked to commercialize the product. He should get it to the point where he can turn it over to the commercial development group. Next, you need a commercial development man. This man must be paid by the company to evaluate and to take risks. Sometimes he must have the courage to say that even though \$5 million has been spent, there is no reason to go any further.

In summary, it can be seen that the critical thread that runs throughout all successful new ventures is communication—between various company departments, management levels, and outside sources. This means more than just meetings and memos. It means true communication whereby the implicit values of all those involved are congruent with their explicit actions.



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Repurchase of their own common stock by companies is becoming more and more popular. However, such repurchase should be decided on only after a few simple factors are weighed. Here they are —

PRACTICAL CONSIDERATIONS IN COMMON STOCK REPURCHASE

by Guy J. Agrati

Chemical Bank

ALTHOUGH much good theoretical analysis of common stock repurchase has been published in recent years, little of practical value has filtered into the everyday world of business finance. Scholarly journals and academic texts almost invariably treat common stock repurchase as a decision in dividend policy.¹ While such an approach is logical and assists in understanding

difficult questions in the financial theory surrounding capital structure, it is of nominal assistance to the corporate treasurer facing the complex problems of common share earnings and, by extension, of market price. As a consequence, senior management has no practical guidelines by which to evaluate stock repurchase, and its direct effects on earnings.

Repurchase of common stock by the corporate issuer is the converse of equity financing through distribution of new or treasury shares for cash. In the same sense that issuance of common shares results in new capital, repurchase is an "investment" in the issuer's own stock, a partial liquidation which results in a contraction of capital. Repurchase is, therefore, a valid

employment of excess funds which may yield greater returns, in earnings per share and market price gains to remaining stockholders, than alternate investments, e.g., treasury bills. Whereas new equity issues (without pre-emptive rights) dilute earnings per share, repurchase by the issuer is counter-dilutive, by withdrawing outstanding stock from public circulation. The knowledgeable and experienced corporate financial officer would, therefore, do well to understand the nature and practice of repurchase as the mirror strategy of equity financing. Well-rounded and effective financial management requires nothing less.

It is a basic premise of this article that common stock repurchase is a valuable financial tool which can

¹ See for example: Harold Bierman, Jr., and Richard West, "The Acquisition of Common Stock by the Corporate Issuer," *Journal of Finance*, December, 1966, pp. 687-96; E. J. Elton and M. Gruber, "The Effect of Share Repurchase on the Value of the Firm," *Journal of Finance*, March, 1968, pp. 135-49; James C. Van Horne, *Financial Management and Policy*, Prentice-Hall, Englewood Cliffs, N.J., 1968, pp. 208-211.

To be truly useful, however, repurchase must be measurable in terms of end result. Also helpful would be a determination of how to finance a repurchase program. Most desirable would be a method of measuring the efficiency of a given repurchase proposal—in effect relating gains resulting from an actual repurchase to potential gains from a no-cost reduction in stock outstanding, i.e., donated capital.

be used to fund stock options, acquisitions for stock, and convertible obligations of the company.² Additionally, current and future years' earnings per share can be enhanced through repurchase, either to offset dilution from one or more of the foregoing transactions; or to improve an unfavorable comparison with past period operating results. To be truly useful, however, repurchase must be measurable in terms of end result. Also helpful would be a determination of how to finance a repurchase program. Most desirable would be a method of measuring the efficiency of a given repurchase proposal—in effect relating gains resulting from an actual repurchase to potential gains from a no-cost reduction in stock outstanding, i.e., donated capital. This article addresses these questions and attempts to develop a practical method of evaluating repurchase under given, real world market conditions.

Effect on earnings per share

Stripped of irrelevant considerations (for the purposes of this article), earnings per share, according to generally accepted accounting principles, is simply the period income after tax divided by the average number of common shares outstanding. All other things being equal, a repurchase of common stock will affect both the numerator and denominator of the earnings per share expression by decreasing both earnings and the average number of shares outstanding. Furthermore, unless the repurchase takes place on the first day of the corporate fiscal year, effects of the repurchase on both numerator and denominator must be time adjusted, in order to correctly arrive at current year EPS. (EPS in future periods is subject to the full effect

² Recent APB opinions may discourage the issuance of repurchased stock for certain acquisitions. As a result, it would be prudent to consult a knowledgeable public accounting firm regarding repurchase prior to actually implementing the repurchase plan.

of the repurchase, barring any future distribution of shares.)

A formula for repurchase

Construction of an expression depicting the effects of repurchase is facilitated by algebraic substitution. Therefore, let:

E = period income after tax.

N = average number of shares outstanding for period given no repurchase.

n_t = number shares repurchased, adjusted for time (i.e., 10,000 shares repurchased half way through the fiscal year is 5,000 shares time adjusted).³

P = repurchase price per share.

D_t = dividend per share, time adjusted (for customary quarterly payment).

i = after-tax opportunity cost.

Earnings per share (EPS) given no repurchase is, therefore:

Equation 1:

$$EPS = E/N$$

Given the repurchase decision earnings will be affected in two ways:

- Dividends not paid on repurchased shares, i.e., treasury stock, may be invested at the opportunity rate, raising earnings. Algebraically, $E + [(i)(D_t)(n_t)]$.
- Funds used for purchase are not available for investment at the opportunity rate, lowering earnings. Again algebraically, $E - [(i)(P)(n_t)]$.

Similarly, average number of shares will decline by the time adjusted number of shares repurchased, $N - n_t$. From Equation 1 earnings per share with repurchase becomes:

³ Earnings per share gains from a given repurchase transaction may be estimated for a future year by setting n equal to the complete number of shares repurchased in the given transaction (in effect, letting $n_t = n$, the number of shares unadjusted). All other variables will, of course, be estimated for future years.

Equation 2:

$$EPS_r = \frac{(E + [(i)(D_t)(n_t)] - [(i)(P)(n_t)])}{(N - n_t)}$$

Example calculation

An example may help to clarify any loose ends before proceeding further:

Let: $E = \$50,000,000$
 $N = 10,000,000$ shares
 $n_t = 100,000$ shares
 $P = \$45$
 $D_t = \$2.00$
 $i = 5.0\%$

Accordingly, Equation 1 yields:

$$EPS = \frac{50,000,000}{10,000,000} = \$5.00$$

and for Equation 2:

$$EPS_r = \frac{(\$50,000,000 + [(0.05)(2.00)(100,000)] - [(0.05)(45)(100,000)])}{(10,000,000 - 100,000)}$$

$$= \frac{(50,000,000 + 10,000 - 225,000)}{(9,900,000)}$$

$$EPS_r = \$5.029 = \$5.03$$

Clearly in this example, as in most actual cases, the positive effect on earnings per share of the decline in the average number of shares outstanding by 100,000 overrode the negative net effect on earnings of \$215,000. Consequently, $EPS_r > EPS$.

Sensitivity analysis of Equation 2 admits some interesting conclusions applicable to a wide range of plausible cases, including the example:

- Earnings per share are not appreciably increased by the non-payment of dividends on recovered treasury stock. In fact, the dividend

investment effect is so small as to be relatively insignificant in almost all cases.

- Earnings per share are only slightly increased by a moderate reduction in purchase price. As a practical matter any point in the trading range of the normal stock ("base" price $\pm 10-15$ per cent) would yield essentially equivalent results in Equation 2.

- Equation 2 is moderately sensitive to changes in opportunity cost, with earnings per share upon repurchase inversely related to the opportunity rate, as expected.

- Equation 2 is quite sensitive to n_t , the time adjusted number of repurchased shares. In effect, 100,000 shares purchased in June will cause only half the gain in per share earnings as 100,000 shares purchased in January, all other factors remaining unchanged.

Financing repurchase

The preceding equations and examples have implicitly assumed internal financing in the use of i to represent the after-tax opportunity rate. The logic hopefully apparent in Equation 2 is, of course, equally valid if the variable b , indicating the after-tax borrowing rate, replaces i in the last term of the numerator (the cost of repurchase). The cost of external funds, b , is applicable only to the cost term of the numerator because dividends not paid on treasury stock will be invested at the internal or opportunity rate, i , regardless of the financing method.

Fortunately, it is not necessary to calculate Equation 2 for both i and b . As was concluded above, the cost of repurchase dominates the dividend investment term, and, therefore, the entire numerator. Hence it follows that the lowest cost source of funds as measured by i or b will yield the highest EPS, e.g., if $i > b$ then $EPS_b > EPS_i$. Other reasons may exist mandating the dual calculation, i.e., company policy prohibits debt for repurchase, seasonal cash shortage, etc., therefore, alternative Equation 2

Earnings per share are not appreciably increased by the non-payment of dividends on recovered treasury stock. In fact, the dividend investment effect is so small as to be relatively insignificant in almost all cases.



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and Sciences and his M.B.A. from Columbia University's Graduate School of Business. He has published an article on "Computer Applications in Financial Analysis," *Tuck School Bulletin*, Winter 1969, and is soon to have another article published.

... critical in the repurchase expression is the time adjusted number of shares repurchased

expressions are set forth below:

• Repurchase using Internal Funds

Equation 2i:

$$EPS_i = \frac{(E + [(i)(D_t)(n_t)] - [(i)(P)(n_t)])}{(N - n_t)}$$

• Repurchase using External Funds

Equation 2b:

$$EPS_b = \frac{(E + [(i)(D_t)(n_t)] - [(b)(P)(n_t)])}{(N - n_t)}$$

An efficiency measure

Conclusions resulting from the sensitivity analysis described above indicate that the critical element in the repurchase expression is the time adjusted number of shares repurchased. The reader has noted that gains in EPS are directly proportional to n_t . A company with publicly traded common stock cannot always plan on a fixed number of shares being available at a given price on a particular date. Diverse market conditions and the effects of large single purchases by the corporation may temporarily influence prices. For these and other reasons it may be prudent to extend the repurchase program over a moderate period of time. Facing various offers of stock over the time frame of such a program, the corporate treasurer requires a means of relating offers to one another and to the ideal situation of a no-cost reduction in outstanding stock. (Stock price can be a guide, but may mislead over longer time periods as other underlying variables change.)

The "efficiency measure," k , described below gives the corporate decision maker an absolute measurement of each offer, based on its EPS effect as a percentage of EPS gain expected from a like amount of donated shares. The calculated k for each offer of stock is, therefore, a measure of the EPS "efficiency"

which would result from that particular repurchase. Comparison of k , therefore, yields an ordinal measure of the optimal repurchase, as represented by the highest k .

Some may object that k cannot be used in evaluating alternative offers, that it is only useful in evaluating against a predetermined standard. We believe, however, that k is useful in evaluating offers against one another insofar as the offers differ in regard to price or financing terms. The size of various offers is automatically adjusted out by k . Evaluation of k against a predetermined standard is, of course, possible; however, each company would have to determine its own unique standard taking into account cash balances, urgency, etc.

Results of the foregoing sensitivity analysis indicate that the earnings increment from investment of unpaid dividends on donated or repurchased stock is not material. Therefore, the calculation of k is simplified by omitting the dividend effect. The three-step determination of k is as follows:

- (1) Calculate the gain in EPS which could be expected from a no-cost reduction in equivalent outstanding shares; the ratio of average shares without repurchase to average shares with repurchase:

$$k_1 = \frac{N}{N - n_t}$$

- (2) Calculate the gain in EPS which can be expected from the actual repurchase offer under consideration. In abbreviated form the value EPS_i/EPS can be expanded as follows:

$$k_2 = \left\{ \frac{E - [(i)(P)(n_t)]}{N - n_t} \right\} / (E/N)$$

- (3) Let k , the "efficiency measure," equal the expected actual gain in EPS, k_2 , as a percentage of expected no-cost equivalent gain in EPS, k_1 , (less one

in both numerator and denominator to obtain gain ratio).

$$k = \frac{k_2 - 1}{k_1 - 1}$$

A final example

At its June 15, 197x meeting the Board of Directors of ABC Corp. resolved to purchase 10 per cent of outstanding ABC common stock, (500,000 shares) over a 120-day period commencing immediately, in order to fund several consummated acquisitions; thus counteracting expected dilution from these acquisitions amounting to five cents per share. Consolidated after-tax earnings for the year ending December 31, 197x are expected to reach approximately \$10,000,000 or \$2.00 per share indicated on an average 5,000,000 shares outstanding (without repurchase).

Offers to sell ABC stock which were accepted are listed below:

June 30th—50,000 at 18

July 29th—350,000 at 20

Sept. 16th—100,000 at 17

Evaluation of the purchases should determine: (a) whether the five cents per share dilution (to \$2.00 pre-repurchase) is covered; and (b) how efficient are the purchase transactions in terms of k values. See Exhibit 1 on page 39.

30th June Purchase

$$EPS_i = \frac{(E - [(i)(P)(n_t)])}{(N - n_t)}$$

$$EPS_i = \frac{(10,000,000 - 22,500)}{(4,975,000)}$$

$$EPS_i = \$2.0055$$

$$k_1 = \frac{N}{N - n_t} = \frac{5,000,000}{4,975,000} = 1.0050$$

$$k_2 = \frac{EPS_i}{EPS} = \frac{2.0055}{2.00} = 1.0027$$

$$k = \frac{k_2 - 1}{k_1 - 1} = \frac{0.0027}{0.0050} = .540$$

EXHIBIT I

Variable	Purchase Date		
	30th June	29th July	16th Sept.
P	18	20	17
N	5,000,000	4,975,000	4,829,190
n	50,000	350,000	100,000
n _t	25,000	145,810	29,160
i	.05	.05	.06
b*	—	.04	—

* Funds borrowed at 8 per cent pre-tax interest for 7/29 purchase; (tax rate 50 per cent).

29th July Purchase (base variables revised to reflect June 30th purchase)

$$\text{EPS}_b = \frac{9,977,500 - 116,648}{4,829,190} = \$2.0419$$

$$k_1 = \frac{4,975,000}{4,829,190} = 1.0302$$

$$k_2 = \frac{2.0419}{2.0054} = 1.0182$$

$$k = \frac{0.0182}{0.0302} = \underline{\underline{.6026}}$$

16th September Purchase (base variables revised to reflect both prior purchases)

$$\text{EPS}_i = \frac{9,860,852 - 29,743}{4,800,030} = \$2.0481$$

$$k_1 = \frac{4,829,190}{4,800,030} = 1.0060$$

$$k_2 = \frac{2.0481}{2.0419} = 1.0030$$

$$k = \frac{0.0030}{0.0060} = \underline{\underline{.500}}$$

The results of our example calculations indicate: (a) the five cent dilution is covered, as the cumulative gain in EPS is \$2.0481 - \$2.00 = \$0.05 (rounded); and (b) that the second purchase, that of July 29th, is most efficient, yielding a value of .6013. As clearly shown by the example, price is not a sufficient guide to efficiency. Purchase at 17 is clearly less efficient than purchase at the higher price of 20 because the significant cost rate b of .04 in the July example has increased, (as i) to .06 in the September example, when external funds are not available.

Understood as the direct oppo-

site of equity financing, repurchase by a corporation of portions of its own outstanding stock is a valuable addition to financial management's range of strategic alternatives. Repurchase can counter EPS dilution from various employee options, convertible obligations or acquisitions for stock, and additionally provides an ever present alternate investment for excess or idle corporate funds. Recognizing the unavoidable gap between financial theory and practice, the author attempted to develop a series of practical steps to determine:

- repurchase effects on EPS
- use of internal vs. external funds
- efficiency of a particular repurchase transaction.

Sensitivity analysis of key expressions developed in the article yields several notable conclusions:

- Dividend savings on repurchased shares are insignificant as a practical matter.
- Purchase price within broad ranges has relatively slight effect on the efficacy of repurchase.
- Opportunity cost and borrowing rates are important determinants of the repurchase decision.
- Current year EPS is very sensitive to repurchase timing, as a result of the "average share" accounting concept of earnings. Future year EPS are, of course, unaffected by timing.

Understood as the direct opposite of equity financing, repurchase by a corporation of portions of its own outstanding stock is a valuable addition to financial management's range of strategic alternatives.

The tendency of systems and procedures units in large organizations is to freeze most activities into a rigid bureaucratic mold that endures forever. Why not set the life-span of every new procedure at its birth? this article asks —

DEVELOPING THE ADAPTIVE ORGANIZATION

by Howard M. Carlisle

Utah State University

ONE OF THE major dilemmas for the modern-day manager results from two of the primary forces affecting organizations. These forces are increasingly working at cross purposes with each other. On the one hand, managers in organizations experience administrative complexity because as firms grow larger they tend to adopt more systems, procedures, policies, and regulations aimed at improving coordination and control. This results in highly intricate, "bureaucratic" organizations. On the other hand, the environment within which firms must operate is becoming increasingly characterized by change. Markets, products, skills, technology, governmental regulations, and all other facets of the environment of a firm are epitomized by

accelerated change. Thus the dilemma results: internal pressures are directed at stability and control; external forces are creating an environment which is much more dynamic in nature.

The full magnitude of these forces must be examined before considering what can be done to reconcile this situation. The tendency towards formalization is noticed by keen observers in all growing organizations. Initially, as the firm is small, few policies or regulations are in existence. Communication is simple. It is also highly effective since there are a limited number of activities taking place and few people involved in any communication link. As operations grow in size and complexity and as the number of employees in-

creases, personal contact and communication with the leaders cannot be relied upon to achieve the coordination and direction required. Written directives and procedures come to take the place of personal interaction. As the firm's operations change and as new problems are encountered, additional policies and procedures are adopted to supplement those that existed before. Rarely, if ever, are the older policies and procedures eliminated or simplified. The result is that, over time, a plethora of policies, systems, procedures, and regulations come into existence. These defy comprehension except by staff specialists who are experts in some narrow phase of a company's operations.

There are many other factors

which contribute to this tendency in organizations. Traditional management theory has supported the highly structured, finitely defined organization. Since the early 1900s, following the lead of Henri Fayol and Max Weber, the bureaucratic form of organization has dominated management thinking and practice. Thus, the tendency has been to develop organizations by creating a precisely interwoven hierarchy based on job specialization, unity of command, span of control, centralization, and the scalar concept. All work activities are controlled by detailed job descriptions, methods analysis, operations sheets, and functional procedures. Traditionalists emphasize that through such a structure a firm should be able to attain simplicity, control, precision, coordination, order, and, above all, efficiency.

Behavior science theory also supports the bureaucratic tendency in organizations. Charles Perrow, the sociologist, notes that even though organizations do not strive to be bureaucratic, the tendency is in that direction. He states:

Even those organizations which do start out as adaptive and innovative strive to rationalize and routinize. Every manager prizes freedom and initiative for himself but attempts to routinize the areas under his control. Similarly, those in control of the expanding, innovative organization appear to maximize their own freedom and rewards by making the organization itself more predictable.¹

Leaders want to be instrumental in insuring that an organization achieves its objectives. Thus, in accordance with their preconceptions for reaching this goal, leaders strive to coordinate, control, and regulate resource utilization within the organization. This, in turn, leads to

subordinates performing their operations in a relatively passive, predictable fashion.

Environmental upheaval

A firm must, of course, depend on outside sources for its existence. It obtains its raw materials and resources from its environment. It returns the finished goods and services to the marketplace of the environment for consumption. The firm is constantly at the mercy of major economic, political, and technological forces. Firms are in a continual process of adjusting to changes in interest rates, modifications of the national level of personal income, new regulatory statutes, the discovery of exotic materials or processes, and the impact of social forces, such as the youth culture which has developed in this country.

Firms could adjust when the change was slow, but as all facets of the environment accelerate toward greater evolution and complexity, the challenge of adaptation becomes one of the major concerns of management. It has been noted that the time lag between scientific invention and manufacture of a product was 112 years for photography. This was reduced to 56 years for the telephone, but more recently it was only five years for the transistor and three years for the integrated circuit. In terms of productivity and automation, in the last 15 years we have doubled the number of automobiles produced with the same number of workers. Markets and products have experienced the same disruption. Major innovations used to occur in various fields every 15 to 20 years. The intervals are now shortened to five to ten years. In the future the time span is expected to be even less.

What does all of this mean for the manager? It means he must strive for a viable organization, which is in the forefront of change. He must be concerned both with attempting to influence the direction of external changes and, also, with anticipating change

so that he can gear his organization to these new demands. If one examines existing markets or industries, especially those involved with scientific products, it is evident that it is the adaptive, innovative organization which has succeeded, and the rigid, uncompromising organization which has tended to fall behind. Whole industries can be typified by these trends. We see that with the railroads. As Warren Bennis, one of the leading writers in management, observed, "Bureaucracy seems most likely to founder on its inability to adapt to rapid change in the environment."²

Implications for management

There are, of course, many avenues that can be pursued in attempting to establish a more viable organization. Many of these relate to familiar proposals regarding leadership styles, management by objectives, sensitivity training, and job enlargement concepts. However, the focus of this article is upon approaches dealing with the structure of organizations. Four such approaches deserve coordination.

The first approach deals with the manner in which systems and procedures are established in organizations. All organizations of moderate size and larger have full-time employees whose responsibilities are to coordinate the development of systems and procedures within the organization. Their responsibilities are to develop, promote, and install systems and procedures needed to regulate all activities of the organization. To fulfill their role, they are compelled to continually add to and modify existing company manuals set up for this purpose. Thus, over time, a vast network of systems and procedures is developed which embraces every significant, (and many times insignificant), activity carried on within the organization. And, like the laws of government, many

¹ Perrow, Charles, *Organizational Analysis: A Sociological View*, Wadsworth Publishing Company, Inc., Belmont, Calif., 1970, p. 66.

² Bennis, Warren G., *Changing Organizations*, McGraw-Hill Book Company, New York, 1966, p. 9.

more such routines are annually established than the few that are revoked. Little wonder that some aerospace organizations in the past have preferred to construct a new plant to start a project rather than use existing facilities. At least in the new plant, they can experience the freedom necessary to innovate rather than risk attempting to get the project off the ground in a highly regulated functioning plant bound by its own procedural straitjacket.

If flexibility is becoming this vital for major organizations, should not deliberate means be undertaken to eliminate regulations, procedures, and reports which serve little purpose other than to make some supervisor feel psychologically secure? This proposal is to modify the role of units responsible for establishing systems and procedures by adding as a major function the responsibility to abolish and consolidate procedures which tend to create rigidity in organizations. The systems unit could replace them with procedures or guidelines aimed at making organizations more adaptive. This is especially important where existing procedures reflect primarily the lack of trust which management has in the work force. Standards are, of course, necessary, but if the standards only tie down, restrict, and antagonize employees, they certainly need to be challenged and reevaluated. The almost uncon-

trolled growth of reports, systems, and procedures, facilitated by the advent of the computer, needs to come under the scrutiny of an organization whose charter is not to expand, embellish, and glorify these regulations, but to restrict them to their proper role in a dynamic organization.

In many governmental agencies and large corporations, the supervisor functions in what is almost a stranglehold of procedural minutia. His area for independent functioning is continually being restricted until it requires considerable enthusiasm to attempt to "do something different." Modifying the mission of systems and procedures staffs in mature organizations to charge them with eliminating as many procedures as they create, could perhaps bring back more of the balance and flexibility in organizations which are necessary if they are to exist as viable entities in the industrial environment of today.

Modifying the criteria

The second proposal is closely related to the first. Not only should the mission of systems and procedures organizations be modified, but the criteria used in developing procedures should also be revised. In the past the key criteria have been expressed in questions such as the following: Do duties, responsibilities, and authority need to be clarified? Is the interface between organizational elements clear? Will a regulation specifying each step to be undertaken in a particular process result in activity being more consistent and orderly? Can human error be reduced by finitely prescribing the manner in which operations are to be performed and by introducing many checks into the system? Can activities tangential to the purposes of an organization be discouraged by forcing numerous approvals and sign offs on pro-

posals which do not fit the daily routine? These criteria should be either modified or supplemented by questions such as the following: Does the procedure provide opportunity for innovation and creativity where appropriate? Does the procedure place unnecessary hurdles in the way of completing a task? Does the procedure result in unnecessary complexity and red tape? Is the procedure resulting in activities being routine and boring rather than challenging and interesting? Is the procedure set up to reward passive, conformist behavior and discourage rational analysis and unique approaches? Will the procedure result in restricting people or in expanding the contribution which they make? Obviously, all industrial activities cannot be made interesting, challenging, and full of opportunity but the general tendency by the originators of most systems and procedures is to underestimate the capacities of people and to downgrade the benefits which can come from more unstructured group activity.

Time duration

A third proposal is one which has been made by Peter Drucker in his book *The Age of Discontinuity*. In referring to government he states:

We may build into government an automatic abandonment process. Instead of starting with the assumption that any program, any agency, and any activity is likely to be eternal, we might start out with the opposite assumption: that each is short-lived and temporary. We might, from the beginning, assume that it will come to an end within five or ten years unless specifically renewed. And we may discipline ourselves not to renew any program un-



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. . . antagonize employees, they certainly need to be challenged and reevaluated

less it has the results that it promised when first started. We may, let us hope, eventually build into government the capacity to appraise results and systematically to abandon yesterday's tasks.³

Such an abandonment principle would also be appropriate to systems and procedures in all organizations. Perhaps a procedure should be given an effectiveness date of three years or whatever period of time would be appropriate for the activity. This would force a future appraisal of the procedure in terms of the results that had been achieved and it would make renewal dependent on demonstrated effectiveness.

This abandonment principle is also reflected in recent industrial practice. It is becoming more and more common for organizations to establish a task force to handle special projects or problems. One of the real advantages of the task force approach is that the organization is automatically dissolved when the assigned activity is completed or the project is brought to a close.

Proficiency in planning

The last proposal is one which has already gained considerable momentum in the past decade. If an organization is to anticipate change it must acquaint itself with the forces that are generating change in the environment. Then it must adapt its organization to these changes which are taking or will take place. If the organization has the size, or special attributes necessary to affect or influence this change, it may choose to utilize its strength accordingly. All of this

places a renewal premium on planning. A firm cannot hope to keep itself attuned to what is taking place in its marketplace and in the other elements of our society unless it is devoting significant resources to planning. Planning is also required to keep the internal activities of an organization oriented to what is taking place externally.

In the early 1960s, there were few organizations which were adequately set up to do an effective job of long-range planning. A study completed by Stanford Research Institute in 1963 found that 2,900 out of the 3,600 U.S. manufacturing firms with sales over ten million dollars had "no formalized system" for long-range planning.⁴ One of the notable management features of the 1960s was the increased emphasis on long-range planning by business firms. By 1968 the number of firms with systems for long-range planning had more than doubled but planning still remains the number one need for improvement in many corporations. Planning is too often nothing more than an existing management system such as budgeting packaged under a new label. According to Alfred P. Sloan, long-time executive of General Motors, one of the major reasons for that organization's success was that while other organizations paid lip service to planning, General Motors devoted resources to it.

A statement by Ralph Cordiner, former president of General Electric is also significant. He stated:

In a time of radical worldwide change, when every day introduces new elements of uncertainty, forward planning may seem to be nearly impossible—an exercise in futility. Yet there never was a more urgent need

for long-range planning on the part of every business, and indeed every important element of our national life.⁵

If organizations are to decrease the uncertainty associated with more rapid change, and if they are to prove adaptive in accommodating to environmental pressures, they must demonstrate a planning capability which is sensitive to these forces.

The highly structured bureaucratic organization which has been dominant in industrial firms in the past is increasingly being viewed with some skepticism. This skepticism results from the rigidities inherent in this type of structure when the economic, political, social, and technological milieu within which the firm functions is characterized by accelerated change. Thus a need arises for deliberate methods of generating bureaucratic de-emphasis.

Four methods are proposed in this article. The first two deal with modifying the orientation of systems and procedures organizations so that they concentrate on building flexibility and opportunities for innovation into systems and procedures, rather than focusing entirely on restraining and confining activity. The third proposal is, where appropriate, to limit the time duration of organizational elements, new programs, and procedures, and make their extension or renewal dependent upon a record of demonstrated effectiveness. And, finally, it was acknowledged that any effort to develop an adaptive organization is ultimately dependent upon the capability to understand the forces of change in our society and to plan and control organization efforts in accordance with these forces.

³ Drucker, Peter F., *The Age of Discontinuity*, Harper and Row, Publishers, New York, 1968, p. 232.

⁴ *Business Week*, June 1, 1963, p. 54.

⁵ Cordiner, Ralph, *New Frontiers for Professional Managers*, McGraw-Hill Book Company, New York, 1956, p. 82.

Most old-line multinational companies have developed well-rounded reporting structures for their foreign subsidiaries. But many newcomers often overlook the importance of reporting on social and political trends in the areas of foreign operation —

REVITALIZED INTERNAL REPORTING FOR FOREIGN OPERATIONS

by James H. Fischer

University of Wisconsin, Whitewater

IN ORDER to satisfy the international needs of American corporate growth,¹ U.S. businessmen must revitalize their internal reporting techniques. Complex environmental factors overseas, such as cultural differences, communication difficulties, new risks, different foreign business practices, and added local government involvement in the economy, through establishment of various restrictive measures and operation of government-owned businesses, preclude the effectiveness of the controls

employed in domestic operations.

A study was conducted by the author to reevaluate information-control techniques² and to suggest changes that would best aid the decision makers of firms with international operations. To this end, the author interviewed 25 financial executives of 17 multinational firms plus approximately 60 public accountants with international business experience. This article is based on his findings.

Many companies that have had

long and extensive experience abroad do, of course, have excellent information on all pertinent facts and trends about the countries where they are operating. But many of the newcomers on the international scene have either overlooked some of the most significant facts that should be reported or have confined such reports to the operating chief of the domestic company. In reality such reports should be prepared and distributed to all management executives to keep them acquainted with the state of the foreign operation, its situation in the foreign country, and its prospects for the future.

Many firms have somehow equated the receipt of voluminous

²Defined by the author as the procedures adopted to efficiently gather, transmit, and interpret information in order to develop a plan, such as a budget, to measure the compliance with the plan, and to use the findings to support control decisions.

¹The book value of U.S. direct foreign investment has increased from \$7 billion prior to World War II to over \$70 billion today according to the U.S. Department of Commerce.

and sometimes irrelevant paperwork with good control even though home office executives sometimes view these internal reports as a frustrating mass of numbers. At the same time, the foreign affiliate's local management often complains that the volume of required reporting hampers its ability to cope with day-to-day operating problems—its chief responsibility. The problem here is to identify the interim data that the home office does, in fact, need for decision making

An internal reporting format designed for foreign operations ought to consist of monthly internal reports of a combination of key financial and operating data and environmental facts complete with local management's interpretive comments on various aspects of the environment. Detailed financial and operating data should be eliminated except as needed on a quarterly and annual basis to comply with such corporate and legal requirements as detailed consolidated statements and annual reports to the U.S. Securities and Exchange Commission. The use of the proposed reporting format, however, ought not, of course, to preclude the use of "flash reports" where deemed necessary to transmit by telex, cable, or messenger service critical information about the affiliate, such as the month's actual sales, or critical environmental information, such as an imminent expropriation.

Key operating data

Exhibit 1, on this page, while not all-inclusive, contains common examples of key financial and operating data that could be used for tailoring a monthly format appropriate for any specified firm. Certain key items, such as sales and profit data, would be essential to all companies, but some of the suggested information might be of interest only to a particular industry, a firm within the industry, or even a particular foreign affiliate of that firm. For example, a cash-rich company might be more concerned

EXHIBIT 1

Key Financial and Operating Data for Internal Reporting

Sales in dollars and units of product
 Gross profit
 Total selling expenses
 Interest expense
 Fees and royalties paid
 Profit before income taxes
 Profit after income taxes
 Backlog of orders
 Incoming orders for the period
 (Since incoming orders are either delivered or in backlog, this figure is an indication of the month's performance against what was forecasted or expected.)
 Progress on capital expenditure projects
 Total inventories
 Cash balance
 A cash forecast
 A measure of affiliate's "exposure"

about worldwide investment opportunities, while a cash-poor company might be more concerned with cash forecasts and sources of funds. Undoubtedly, some multinational firms would need to add other numerical data requirements because of the particular nature of their affiliate operations or the general nature of their business.

The gross measurements included in Exhibit 1³ are self-explanatory except, perhaps, for the final item—the numerical measure called "exposure." A company's "exposure" is generally considered to be the potential net gain or loss in currency revaluations on local currency assets and liabilities (such as cash) and local currency short-term receivables and payables.

The inclusion in the proposed internal reporting format of a calculation of the "exposure" is particularly useful when the affiliate is located in a country with unstable currency. This calculation, which could be a summary of the principal affected assets and liabilities in a local currency revaluation, indicates the amount of the present risk on a continuing basis to both the local affiliate and home office management. Because both present and expected future risks must be considered in planning protective measures in order to minimize

losses when currency values are changed, a budget can complement the information contained in the internal reports since it provides the means for projecting the expected net asset position of the foreign affiliate.

When the home office has complete confidence in its foreign personnel and a comprehensive budget based on the best that the affiliate can and should do, all actual account balances can be compared with budgeted amounts, and only significant deviations—those key items falling outside specified limits—would be reported to the home office. This procedure, this "exception reporting," enables the home office to review the information more quickly.

Environmental information

Conducting business in a foreign environment adds significant complexities; we call these external factors "environmental variables." How multinational firms react to these variables, or factors, often determines the financial success or failure of a foreign affiliate. For this reason, a new dimension—environmental information—should be added to the key financial and operating data discussed in the previous section.

The process of keeping the home office informed of the business climate in which the foreign affiliate is operating is a difficult task be-

³For the most effective control, gross measurements should be translated from foreign currency into U.S. dollars by the affiliate.

EXHIBIT 2

Types of Environmental Information for Internal Reporting

Symptoms of currency devaluation

- Inflation
- Unfavorable balance of payments
- Decline of gold and hard currency reserves
- Rising interest rates
- Increased cost of "hedging"
- Foreign exchange controls
- Speculation in currency

Government and politics

- Political implications
- Proposed laws
- Changes in fiscal and monetary policies
- Changes in various government regulations
- Expropriation warnings

Social and economic factors

- Government-sponsored "development objectives"
- Competitive intelligence
- Labor
- Various economic factors

cause, unlike the domestic environment, the foreign scene is often in a constant state of change. The task is particularly difficult when foreign operations are spread throughout the world. For this reason, multinational firms should develop an environmental intelligence and require a periodic review of both adverse and favorable trends as well as current developments in the social, economic, and political sphere of all geographic regions where the company has operations.

This section suggests types of environmental information that multinational firms ought to consider in their designs of internal reporting. Exhibit 2, above, summarizes desirable environmental data.

A major risk of operating in a foreign environment in the past has been fluctuations in the relative values of its currency. This is currently not much of a problem with large, well organized countries with strong economies; The reverse has been true: these countries have had cause to fear the stability of the American dollar. But with small, weak, or underdeveloped countries, currency fluctuations are a very real problem to the American company doing business there.

The reasons that lead to a gov-

ernment's decision to revalue its currency (and to impose foreign exchange controls) are many and complicated. A complete analysis of the problem is beyond the scope of this study; however, experts appear to agree that a disproportionately high rate of inflation in the host country and an unfavorable balance of payments appear to be the principal underlying causes. Both of these factors were important in the recent devaluation of the American dollar.

This governmental action, however, does not occur without warning. Both the risk and the consequent exchange losses can be minimized by executives whose responsibility it is to ferret out adequate and timely information in time to take protective measures. An internal reporting format that includes information on the symptoms of devaluation and numerical information on the amount of "exposure" would communicate the necessary information to local affiliate and home office management.

Top management must be made aware of inflationary conditions (general increase in prices) in all countries where the firm does business. Executives should see fore-

warnings in: (1) an expansion in the supply of money through bank credit at a rate greater than the growth in economic activity (GNP); (2) recurring budgetary deficits resulting primarily from increased spending by the national government; and (3) wage hikes far in excess of increases in labor productivity.

Any significant change can not only distort operating results but it can also weaken local currencies and lead to devaluation and to exchange losses.

Balance of payments

The most important influence on the balance of payments—the inflow and outflow of foreign exchange—is the balance of trade or simply the net result of import and export activities. Exports and imports ought to be analyzed in internal reporting to determine the extent to which trade contributes to or uses foreign exchange. For example, a decline in exports and an increase in imports could be causes for concern.

Factors other than inflation—technology, for example—have an influence on a country's ability to compete on the world market. A lack of technological advances was, in some industries, said to have hurt Great Britain's ability to compete in foreign markets. In addition, nations that are dependent on one commodity, such as coffee in some Latin American countries, must rely to excess on the world supply and demand of that product. A reduction of either supply or demand has a major impact on the amount of foreign exchange that a country can earn.

Although the balance of payments is influenced primarily by trading—that is, imports and exports—the flow of private capital and government funds are sometimes a significant portion of the balance of payments activity. Items to watch are: (1) excessive exports of domestic capital; (2) withdrawal of foreign invested capital; (3) governmental spending abroad, such

as for foreign aid and wars that cause outflow of funds; and (4) repayment of foreign government debts. In many developing countries the debt repayment, and interest thereon, is a significant portion of foreign exchange earned from exports.

Other devaluation symptoms

Another symptom of currency devaluation that top management should be made aware of is a significant rate of decline in a country's monetary reserves. The adequacy of these reserves is in part also determined by the ability of the country to borrow currencies from outside sources. One method of measuring the adequacy of these reserves is to determine the number of months the current rate of imports would be covered by the existing reserves.

Rising interest rates and increased costs of "hedging" also point to possible future currency devaluation. Since borrowing in the local currency is a principal protective measure against foreign exchange losses, rising interest rates sometimes signal defensive borrowings for purposes such as remittance of funds abroad or purchase of tangible assets. Also, because hedging of currencies is another common protective measure, the "rising costs of dollars for future delivery indicate that sellers of dollars have less confidence in the local currency and are commanding higher premiums for parting with their dollars," Price Waterhouse & Co. has noted.⁴

Temporary local government measures, such as foreign exchange controls that restrict the availability of foreign exchange, ought to alert businessmen to local currency difficulties.

Finally, speculation in the currencies expected to be devaluated often bring on the ultimate govern-

ment decision to devalue its currency. For example, immediately prior to the devaluation of the French franc, the British pound, and, most recently, the U.S. dollar, speculators sold large amounts. Foreign exchange and gold reserves correspondingly dropped sharply.

When protective measures are called for, they ought to be coordinated from some central location, preferably the U.S. home office. Receipt of appropriate environmental information from the affiliates through internal reports that have been confirmed by outside sources, such as bankers or public accountants, would supply the necessary information. An example of what can occur when protective measures are not coordinated is illustrated by the experience of a Chicago-based firm during the British devaluation in November, 1967. Within this multinational firm three different individuals independently took hedge positions in pounds—the chief financial executive in the British affiliate, the controller of the international division, and the corporate financial vice-president of the corporation. In this instance the firm reaped a profit on the devaluation, but, given other circumstances, the duplication of effort might have resulted in a loss.

Government and politics

The stability of the American Government has made it unnecessary for American businessmen to worry unduly about Government interference, but, when they estab-



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Top management must be made aware of inflationary conditions in all countries where the firm does business.

Executives should see forewarnings in:

- ***An expansion in the supply of money through bank credit at a rate greater than the growth in economic activity,***
- ***Recurring budgetary deficits resulting primarily from increased spending by the national government; and***
- ***Wage hikes far in excess of increases in labor productivity.***

⁴Price Waterhouse & Co., *Current Foreign Exchange Information (At December 31, 1968)*, January 8, 1969, p. 50.

. . . it is extremely important that home office policies on private investment decisions . . .

lish foreign affiliates, they become acutely aware of governmental control. In the alien environment, they generally find extensive government involvement in various facets of the economy, uncertain political risks, and the startling fact that ultimate power to control the foreign affiliate rests with the host government. Therefore, the internal reporting format ought to contain information about the actions of government and the politics that motivate it.

Noting political implications

Included in internal reporting ought to be information on the political implications of recent local and national elections, on the make-up of the government itself, on possible changes in the government such as philosophical swings to the right or left, on shifts in attitudes toward the United States government, and on changes in political stability. In Australia, for example, the Liberal Country Party Coalition is consistently returned to office in nonviolent elections. However, in Latin America drastic changes in governments have been frequent. Military and civilian regimes in Latin America, for example, have been frequently overthrown, often with violence, and the new government often displays a hostile attitude toward foreign business interests.

Proposed laws that would affect the business climate should also be reported so that the firm can plan for their expected impact. In addition, firms should be interested in proposed changes in the basic legal system, in antitrust laws, and in laws affecting a company's organizational structure, ownership policies, and personnel staffing. For example, the firm should note changes in the degree of freedom of foreigners to enter various industries,

what kind of local equity participation in foreign business interests is being encouraged or stipulated, and any proposed change in immigration laws that could affect the ability of the firm to transfer American technical and management personnel to the affiliate. The status of relations with local business is also important because dissatisfactions could pressure the host government to place legal checks on the expansion of U.S. and other foreign firms within its boundaries.

The fiscal and monetary policies of the host government are also crucial to the multinational firm because these policies can offer a clue to a possible currency revaluation and a fluctuation in the tax rate. Multinational firms are accustomed to anticipating tax changes at home and need to be equally aware of them abroad. A company with business transactions in many parts of the world has much flexibility to act, but without adequate, pertinent internal reporting, the company is unable to anticipate tax changes in time to act judiciously.

The proposed internal reporting format also contains timely information regarding the economic restrictions, regulations, and controls of the host government. These change sporadically in developing countries and can have a significant impact on business operations. Exchange controls, import quotas, tariff structure, patent policies, credit regulations, and embargoes on certain exports all figure prominently. For example, government discriminatory actions could interrupt the supply of imported essential raw materials, machinery, and parts and seriously curtail production. In developing countries, the government often sets some retail prices. A multinational firm must be able to watch closely the prospects for price controls in its industry or, if they exist, it must follow closely

and react rapidly to anticipated changes upward or downward in the selling price.

In addition, the home office needs information concerning new or proposed restrictions on the remittance of profits, interest, and royalties and the repatriation of loans and capital. This knowledge is needed at the home office in order to plan and manage the flow of funds among company operations in various countries, and it is needed if the firm must take steps to reduce its exposure risk when local currency devaluation is a probability.

The home office should continuously appraise the risk of expropriation, particularly in developing countries. Environmental reporting that includes comments on the political and governmental scene could disclose the variety of events that warn of potential expropriation. Local affiliate management's reporting of recurring threats, antagonistic feelings toward Americans, campaign promises, and political philosophical swings could provide the necessary warning. Although warning signals cannot prevent expropriation, they can help the multinational firm to minimize its losses by ending all new investment in the enterprise, cutting back production, decreasing inventories, or accelerating remittances to the United States. These measures, however, can be employed only when environmental reporting has been accurate and timely.

Social and economic factors

Multinational firms that have proven their success in foreign environments have exhibited appropriate concern for the social and economic needs of the host country. As Messrs. Vivian and Michelsen-Terry put it:

Nowhere is the need for social

. . . be consistent with the development goals of the [foreign] economy as a whole

sensitivity more urgent and the difficulty of meeting it greater, than in the management of a multinational enterprise. . . . The big, foreign corporation has long been a convenient scapegoat for those who would capitalize on the restlessness and the rising but unmet expectations of much of the world's population.⁵

Sometimes the needs of local populations are articulated in periodic government-sponsored development objectives or plans which include conservation of natural resources, development of a balanced and diversified economy, support and respect for local culture, patterns of living and popular aspirations, training of nationals for managerial positions, the promotion of local industry through local procurement, and investment in operations that will either save foreign exchange by reducing imports or earn additional foreign exchange through increased exports.

Since compliance with such government objectives must officially originate in the home office, it is imperative that some means be provided for the conscious development of intercultural sensitivity. The new dimension of internal reporting could provide this flow of intelligence.

Because economic resources are often scarce, particularly in developing countries, and because of extensive local government involvement in the economy, it is extremely important that home office policies on private investment decisions be consistent with the development objectives of the economy as a whole. Furthermore, a U.S. firm

that can demonstrate that its business operations fill a crucial gap in the local economy is more likely to enjoy freedom from government interference. To this end, U.S. multinational firms ought to seek up-to-date information on the Agency for International Development projects in the host countries so that they can, where possible, coordinate their efforts with U.S. Government aid for the benefit of the local economy. Local affiliate management can provide grassroots insight into the expectations and success of these programs.

Most corporations seek to expand their operations whether at home or abroad and, therefore, need information on both fronts regarding the available opportunities. In the case of foreign operations, these opportunities might come in the form of providing the tools for local development projects. For example, if the government is planning an extensive irrigation project, the foreign affiliate might expand its products to include the equipment needed, such as pumps or pipe. Although the development plans of local government provide business opportunities, they also should warn U.S. companies that they need to tailor the products of their foreign affiliates to the expected physical requirements of the local government plans. Where governments seek to conserve scarce foreign exchange, an unresponsive company might be left to suffer from the results of government-imposed high import tariffs or exchange controls.

Opportunities might also come from observing the activities of competitors. Local foreign affiliate management is in a critical position to report on new proposed major investments, significant management changes, new technology, and changes in market shares. If such information is not available in time, a company's chance for successful

expansion or adjustment could be ruined by the need to make uncalculated decisions. In either case, environmental information needs to include whatever changes are being made both in private industry and in government.

Timely information on labor conditions often affects the decision making of top management and should, therefore, be included in internal reporting. Labor politics—for example, influence of communist ideology—labor relations, threat of strikes, proposed labor legislation affecting hiring and firing freedom and wage costs, and trained labor supply and the factors affecting it might be appropriate for comment.

Various economic factors and indicators are also essential items of information. Unemployment, stability of costs and prices, recent and projected changes in the rate of economic growth, population growth and trends, raw material discoveries or technological developments such as in food production, land use, and mining and oil discoveries, actual and expected changes in consumer, government, and industrial demand for goods and services (particularly the affiliate's products), capital availability, and emergence of common markets are all items worthy of comment from time to time.

In order to develop a workable format, any firm must first identify the items that would serve its needs. For example, a drug firm would choose those concerning governmental involvement in the economy, particularly policies on retail price controls. A consumer-products company, on the other hand, would be more interested in projections of the standard of living, age distribution of population, and consumer disposable income. A capital-goods company would concentrate on governmental development plans

⁵ Vivian, John, and Carlos Michelsen-Terry, "International Renumeration," *World*, Spring, 1969, p. 51. This is a publication of Peat, Marwick, Mitchell & Co., 345 Park Ave., New York, N.Y. 10022.

for promoting industrial expansion. All types of firms would need to accelerate their reports of political intelligence in a country that exhibits increasing communistic tendencies.

This article does not attempt to identify the environmental factors that ought to be in the reporting format of any specific kind of company; rather, it offers illustrations of significant factors from which a multinational firm could choose in designing a format tailored to its needs. A final consideration would be the extent of detail to be included in the reported environmental information; this would be the result of subjective judgment on the part of home office management and would be influenced by extent of experience, education, and amount of exposure to independent sources of information such as external auditors.

An evaluation

Detailed financial and operating data are themselves inadequate for effective decision making. They must be accompanied by environmental facts if they are to measure the success or failure of an affiliate. Profit per se is often not the complete measure of success because, to lighten the total tax burden, profits might be distorted through artificial intercorporate pricing arrangements, management fees, interest payments, and royalty rates.⁶ In addition, conventional accounting profit measurement does not include an indication of the change in the affiliate's future business prospects in a changing, complex, and unfamiliar foreign environment. The subjective measures supplied by environmental factors often give a better indication of expected future profits than can the bare numerical data.

The proposed concept of in-

⁶While profits might be similarly shifted within U.S. domestic operations by the same devices, there is substantially less motivation to do so when operations are within the tax boundaries of one nation—the United States.

ternal reporting for foreign operations—the use of key financial and operating data plus environmental data—would keep the home office informed regarding compliance with established policies and plans and indicate a need for corrective action. These revitalized internal reports would also provide a highlighted overview of operations useful in analyzing results of current operations and in making future plans and policy decisions.

Added local responsibility

Because this concept of internal reporting would give the affiliate manager the added responsibility of supplying environmental information to the home office, it would force him to look at his operations from a broader point of view. Hopefully, it would keep him from becoming entrenched in a mass of numerical data and, instead, put him on the alert concerning the place his operation occupies in the community, the importance of contacts with local government, and an increased vigilance over local news developments. The new role would cast him in a part similar to that of the president of a domestic corporation.

Use of the proposed internal reporting package would eliminate irrelevant numerical data, replace haphazard collection with a systematic, coordinated procedure, and save valuable time for both the affiliate and the home office. Time and effort saved by eliminating masses of financial and operating details could be used to add vital environmental information that is crucial to the success and development of the affiliate. Because environmental information can be gathered on a current basis and because of the compilation of substantially fewer numerical data, the home office ought to receive more timely internal reports. Finally, this reporting package would be applicable to any size company and would offer flexibility in the constantly changing foreign environment.

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Advantages, disadvantages of outside vs. in-house pension fund management discussed at Conference Board's Seventh Annual Financial Conference in New York —

MANAGING PENSION FUNDS SENSIBLY, PROFITABLY, SAFELY

by Louise H. Dratler

Associate Editor

LONGER life-spans, rapid technical obsolescence, greater automation, earlier retirement—these are some of the factors making pension plans so important to today's workers. Few people want to rely solely on Social Security benefits in their old age.

The increasing sums of money being contributed to pension funds have made them important to the financial community as well. The funds represent a source of long-term investment capital. However, it is up to responsible company officials to select the right investment advisers to make these funds grow. Companies are giving in-

creasing time and thought to the management of pension funds and have evolved several methods of handling them profitably.

This was the topic at a Conference Board panel session, "Challenges in Pension Fund Management," at its Seventh Annual Financial Conference, February 23-24 in New York. The three panelists addressed themselves to different methods of handling these funds, either through the employment of one outside "money manager," of several, or of do-it-yourself pension fund management.

Corporate pension funds currently account for over \$100 billion,

William A. Hayes, director of pension fund investments for the International Telephone and Telegraph Corporation, told The Conference Board members. Pension funds are both a large asset base and an escalating expense item for corporations, he noted, and are presently one of the most dynamic growth markets in the United States. Over the decade there has been a threefold jump in benefits paid and almost a threefold jump in contributions to the funds.

Mr. Hayes considered the question of how a company should choose a money management firm from the many available, or "how

to choose the best from the best." In its search for a money manager, the company must consider such questions as: How much weight should be given to the manager's past performance? Should a large or small firm be selected? Are we striving for geographic dispersion in our investments? Should the fund invest in growth stocks?

At the start, the company should decide what performance and what return it will ask for on its investments. Ten per cent per year or more is quite an acceptable rate, Mr. Hayes said.

Four check marks

When reviewing a financial management firm's [in the parlance, a money manager's] record, Mr. Hayes advised, four checks should be made: What level of risk has the firm assumed? Are the same people that helped to establish this record still with the firm? Has the market changed from the period encompassed in the firm's record? Does the record cover several market periods, bear as well as bull?

A checklist of ten key characteristics to help in the selection of a pension fund manager was outlined by the ITT pension fund investments director:

1 - Does the firm have a clear philosophy of operation? It should not try to "play all games at all times." Does the firm's philosophy agree with yours?

2 - What is the firm's depth of talent? "There should be more than just a strong leader at the top." One should try to meet as many members of the team as possible.

3 - Does the firm have a strong research base and a record of good stock selection? "The best money managers typically pay top dollar for the best research available."

4 - Does the firm have the ability to cope with time compression, volatility, and emotional content of the market? "Go visit its office to see."

5 - Does the firm have a combination of "macro" and "mini" thinkers? It should show evidence

of making quick, firm decisions, and "not get lost in GNP figures," which could disguise the conditions affecting a particular investment.

6 - What is the quality of the firm's holdings? The firm should have been through at least one bear market.

7 - Does the firm have a sense of market history? It should show signs of "watching the crowd from a safe distance."

8 - Does the firm have a strong concept of risk and reward? What are the risk parameters of the manager's portfolio?

9 - Does the firm have the ability to recognize its errors? Does it realize its past mistakes and know what it should have bought or sold?

10 - The men managing investments should be "having fun"; they should still be fascinated by the securities market.

A company's relationship with its pension fund money manager will usually be a long one, Mr. Hayes said. These ten characteristics should provide the outline for a dialogue to give the company a perspective of the manager's work and ability.

Splitting fund management

Splitting pension funds, that is, allocating money to various investment managers to improve long-term performance, is a technique employed at General Telephone and Electronics Corporation as well as many other big corporations with large assets, said panelist James M. Dunn, Jr., assistant treasurer and director of pension fund administration for GTE.

Before splitting a pension fund the primary considerations to be weighed are: *The size of the fund*—if it is too small (under \$5 million) it should not be split; *the characteristics of the pension plan*, such as the age of the work force and the cash flow; *the economics of the business*, such as the difference in contributions going into the fund; *the time horizon*—30 years is typical, for while you don't want to lose money in the short term, it is

the long term that should always be paramount; and *the desired reward/risk levels*—what is the risk level managers should assume, remembering always they are investing for a pension fund.

Company's objectives are factor

Mr. Dunn said the company must rank its objectives; at some points in a company's history some objectives are more important than others. There must be communication, both written and oral, of the company's objectives to the investment manager. The communication should be two-way between the manager and the company.

GTE has a \$900-million pension fund. Some of the characteristics it looks for in its money managers are: organization and experience; philosophy and approach; historical performance; strategy development; and motivation. GTE looks for overall professionalism in its investment managers and asks what is the likelihood of good long-term performance, Mr. Dunn said. "The guy who says he can do 20 per cent per year compounded is exaggerating," he said. "Five to 12½ per cent is realistic."

He then cited the advantages of splitting a pension fund. Splitting affords a wide range of expertise because of the many talented managers involved. It allows for flexibility, as it enables switching between managers. Splitting gives the fund diversification in terms of issues, risk talent, etc.

Splitting also motivates the money managers to perform well because there is competition among fund managers. GTE employs a "weed and feed" approach with its money managers, Mr. Dunn explained. Those managers that do well are given a larger portion of the fund's portfolio and all managers are told how they are performing relative to one another. Splitting also allows an education period for the fund money managers. This is a "farm team concept," Mr. Dunn said, which allows GTE to give a manager a small portion of the cor-

poration's portfolio and to increase the portion as the manager's performance warrants. The final advantage, and the advantage that all the others are supposed to lead to, is the possibility of improved long-term total return, Mr. Dunn stated.

There are disadvantages to splitting the pension fund. Mr. Dunn cited "the dilution of excellence" as one. Splitting dilutes the effect of what one good manager could accomplish. There are added expenses because of splitting, i.e., implementation funds, more trustee fees, more home office time spent. Also, splitting adds to the communications necessary. Splitting presents the danger of overdiversification. When this happens, "weed and feed" procedures are called for, Mr. Dunn advised.

If a company decides to split its pension fund among several investment managers the methodology involves four phases. First, the dollars have to be allocated. "Obviously you want to put the most with the guy doing the best," Mr. Dunn said. However, the company should have some money with managers it is grooming for future use. A second group of tasks is communications and motivation. The third is monitoring and evaluating results. Finally, the company must deal with performance. If a manager is not doing well, as a last resort you get rid of him, but it is a last resort because it is expensive, he noted.

In splitting, the reward comes from selecting the right money managers, he said. You must get talent to work with your assets, Mr. Dunn reasserted.

In-house management

What about in-house management of pension funds, where the company does its own investment management? Unlike many home handymen who turn to do-it-yourself projects because they lack the funds to call in a professional repairman, do-it-yourself pension fund investment management is being done by the companies that have the most money to work with

and could easily afford an outside professional's services. Usually, of course, these are the companies that have staffs with the necessary expertise.

William R. Donnelly, vice president of TRW Inc., said that his company now has six separate pension funds, one of them managed in-house, while the other five are handled by outside investment managers. TRW receives daily reports of the buying and selling activities of all its managers and holds monthly meetings with them. In-house investment management is reached by a slow, evolutionary road, Mr. Donnelly said. The largest companies are those doing the most in-house management. G.E., U.S. Steel, General Tire, and DuPont are some of those that have successfully tried in-house investment management, the TRW vice president added.

Mr. Donnelly pointed out the advantages of in-house pension fund investment management: There is clearly defined responsibility of fund management under corporate officers, which eases the problem of communicating company objectives to fund managers. In-house affords greater control of portfolio selections. Mr. Donnelly cited the example of one fund manager buying a stock while another is selling the same stock, so that the fund winds up trading with itself and has multiple broker fees to pay. None of this can happen with in-house investment management. He also cited the possibility of an outside fund manager buying stock in a business the pension fund's company is trying to acquire, thus running up the price of the stock.

Outside investment advisers often have a high turnover in personnel and every time the pension fund is assigned to a new man the company's objectives must be explained to him. With an in-house operation, company management has the ability to select, hire, and retain employees it finds satisfactory, Mr. Donnelly said.

An in-house operation also gives

the pension fund the ability to make quick market decisions. Information developed by in-house officers in other divisions is available to an employee while it might not be to an outside adviser. In-house management allows the company to direct commissions to the firms it prefers and to save commission expense by dealing in third and fourth markets [transactions not made through an exchange or normal over-the-counter procedures] or arranging new negotiating rates through large block sales. Finally, in-house investment management protects the company from potential conflicts of interest.

In-house drawbacks

The disadvantages of in-house management include adding to direct corporate costs the salaries of staff personnel for this function. With an outside manager these costs would be absorbed by the pension fund or included in the commission fee. In-house management also creates a new department to supervise with the attendant difficulty of finding the right staff for it, something beyond the ordinary capabilities of most personnel departments. Mr. Donnelly also observed that generally the members of many companies' boards are older individuals who tend to be ultra-conservative. They worry about making a bad investment decision for the pension fund because they fear risking a class action suit.

The growth of pension funds is large enough for both in-house and outside advisers to work in the same market, Mr. Donnelly said. "I think the more aggressive firms will be moving to in-house where they have more control of their funds," he said.

In a question and answer session that followed the panelists' presentations, Mr. Dunn stated that Government regulation of pension funds is coming and said he hoped that the legislation which evolves will be fair and workable for all parties concerned.

what people are writing about

BOOKS

The Executive's New Computer: Six Keys to Systems Success

by OLIVER WIGHT, Reston Publishing Company, Inc. (a Prentice-Hall company), Reston, Virginia 22070, 1972, 182 pages, \$10.95.

In this lively attack on the cult of computer sophistication a consultant debunks operations research, integrated systems, and some other misused terms with humor, common sense, and some harsh words for systems managers and consultants.

No one familiar with electronic data processing could possibly disagree with the principal thesis of Oliver Wight's book, namely, "Systems are tools for the manager, not toys for the technician." Some of his other themes are more controversial:

"The notion that the development of 'Totally Integrated Management Information Systems' should be a primary goal for many companies . . . is absurd. It is also foolish to assume that the best solution to most companies' problems is to 'design a simulation model of the business.' One of the classical misdirections of the early years of the computer age was oversophistica-

tion. We have learned—the hard way—that scientific management has not usually been the real payoff application. Most of the payoffs today are in the areas of 'massive manipulations of data.' And the most successful systems are the ones that are designed to support—not supplant—the activities of people."

Some of these assertions would be challenged by many data processing people. How often, for example, do we read that the real potential of the computer is in making management more scientific? Yet Wright's arguments have an aura, at least, of having been written from experience.

REVIEW EDITORS

In order to assure comprehensive coverage of magazine articles dealing with management subjects, MANAGEMENT ADVISER has arranged with fifteen universities offering the Ph.D. degree in accounting to have leading magazines in the field reviewed on a continuing basis by Ph.D. candidates under the guidance of the educators listed, who serve as the review board for this department of MANAGEMENT ADVISER. Unsigned reviews have been written by members of the magazine's staff.

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His name is not exactly a household word. Perhaps in awareness of that fact, "in this day of the instant authority and self-appointed expert," Mr. Wight takes pains to spell out his background for the reader. He says he spent nine years in production and inventory control with the Raybestos Division of Raybestos-Manhattan, three and a half years as a corporate production control consultant to the 13 divisions of the Stanley Works, and three years as an industry education manager in the manufacturing industries marketing department of IBM before becoming an independent consultant. Whether or not he qualifies as a general "computer systems expert" (a term that he himself ridicules), he does seem to have had experience in the application of computers to manufacturing. For that reason, and because, he says, production and inventory management is the field "with the biggest payoff potential in most manufacturing companies," all his examples are drawn from that field.

Mr. Wight starts off with the now-familiar assertion, made by McKinsey & Company and others, that most computer systems simply have not paid off for the companies that installed them. He states it more strongly than most: "... even today, most executives don't realize how bad the situation really is . . . The truth is that the number of companies actually getting a payoff from computers represents a very, very small percentage of the total that have tried." These statements, he cheerfully admits, "like most others in this book . . . are based on my knowledge of computer applications in manufacturing companies."

Mr. Wight lists six major reasons for computer systems failure:

"1. System too sophisticated and ambitious.

"2. Application not sound.

"3. Systems people assumed—and management abdicated—responsibility for system design.

"4. Designed to supplant—not support—the user.

"5. Optimistic implementation.

"6. Company incapable of managing with a system."

Of these six reasons, he thinks, Reason 6, "inability to manage with a system—is really the most universal problem. Today, few companies do enough other things right to allow one to judge whether or not they could have managed with their system."

This is a provocative thought, but it is, unfortunately, one of the least developed themes in the book. Perhaps 182 pages were just not enough to tell a company how to prepare itself for systematization of its management. Or perhaps it is simply easier to attack than to be positive. (The book as a whole shows clearly that Mr. Wight, like most critics, found it easier to be clever and striking when accentuating the negative.)

Reason 1, on the other hand, is very well developed. Mr. Wight does a scathing—and rather convincing—job of attacking oversophistication.

The most successful systems, he says, tend to be essentially simple. "When systems are too sophisticated the user does not understand them and tends either to follow them blindly or ignore them completely and develop his own informal subsystems."

He criticizes, for example, attempts to optimize the lot-size mathematically by various calculations involving the forecast of future demand, the item's unit cost, machine setup cost, and inventory carrying cost. "Forecasts are usually wrong, by definition. Unit costs and machine setup costs (if available) are approximations at best. Almost no one claims to know what it really costs in total to carry inventory; we can only estimate a reasonable figure. But isn't it fun to develop a formula that can massage an error and an approximation and an estimate to get precise results!"

In the course of his attack on sophistication (a bad word to Mr. Wight) the author bears down hard on operations research, "no longer

in vogue," and its practitioners. "Too many operations researchers have found it much more entertaining to communicate with each other rather than to communicate with managers who have forgotten most of the calculus they ever knew. They have also often found developing elegant solutions to trivial problems more challenging than working on the real business problems. They start out with the assumption that the solution is going to be a complex mathematical one and often develop elaborate inventory models that are difficult to apply in a company where the managers have not yet figured out how to keep the inventory-on-hand balance record correct."

He also bears down on consultants (including those from CPA firms), systems managers, and computer salesmen, all of whom, partly because of self-interest, partly because of the customs of their own worlds, have become, he says, part of the "conspiracy for sophistication."

The real test of value, according to Mr. Wight, is not the computer's ability to handle added sophistication, but the user's. He suggests these tests of "systems value analysis":

"1. Will it really be more effective or is it primarily intellectually appealing?"

"2. When considering the function and significance of this element in the real world, is this an area that is worth really fine tuning?"

"3. Identify the last 20 per cent of sophistication that will generate 80 per cent of the system cost and confusion.

"4. What will the extra sophistication cost in user understanding of this part of the system? Of the overall system?"

"5. Is there a simpler way to do it?"

Mr. Wight does have other constructive suggestions to make besides, "Keep it simple." Although the negative sections of his book are much wittier and much more memorable, he does have some

good ideas to offer about how to pick the areas of profitable application for the computer and about who should design EDP systems and how.

His six keys to systems success, given in an appendix, are the inverse of his six reasons for failure. In other appendices he offers checklists of systems shibboleths, management shibboleths, and questions and answers for determining payoff application.

Like many a book that apparently grew out of a successful speech, this one attracts more attention by its boldly negative statements than by its positive ideas. When he is put under obligation to be positive, Mr. Wight has a tendency to fade away in generalities.

Even so, this is a book that ably represents the viewpoint of the sophisticated (pardon the term) computer user. As such, it should be read by every computer manager, salesman, and consultant.

Business Planning and Policy Formulation by ROBERT J. MOCKLER, Appleton-Century-Crofts, New York, 1972, 124 pages, \$8.95.

A primer on business planning, this book is an attempt at a comprehensive outline of what planning and policy development are, how they are related, and how they are carried out in a business.

Long-range planning is one of the newer fads in management. In 1962 the Stanford Research Institute found only a "tiny" number of companies with fully developed and staffed long-range planning programs. By 1967 more than half of the 45 major corporations included in another study had long-range planning departments.

That is not to say that in all cases these companies know what they are doing. Indeed, says Professor Mockler, there is a good deal of confusion among business managers as to exactly what planning and policy development are and

how they are performed. A particular problem has been failure to define adequately the relation between planning and policy development, which has often resulted in failure to integrate policies effectively with overall company objectives and strategies.

That is the rationale behind this book. There are many books on planning and many on policy development, but few, this author feels, that deal with both in proper relationship to each other. He has tried to write a concise, practical, unifying summary that covers business planning theory, procedures for planning at all levels in a step-by-step approach, ways to apply the approach in various business situations, and guidelines for developing policies within this framework.

Professor Mockler starts by presenting a basic business planning process or model applicable to all levels and kinds of planning situations and explaining how it is related to the process of problem solving and decision making. He distinguishes and discusses two kinds of business planning: strategic planning for overall planning direction and implementation planning to execute these directions.

He develops guidelines for using the business planning process at various levels of management and in various functions and examines the interrelationships among them in a variety of business situations. Then he explains the place of policy development within the planning process and sets forth guidelines for developing policies based on strategic planning.

Additional chapters deal with some of the newer tools of management such as operations research, information systems, and electronic data processing; organization planning; and special problems of planning in small business. The conclusion summarizes the work of other writers in the field. The appendix contains several case studies, some hypothetical ones from the files of the Harvard Business School and some actual ones

from previously published works as well as some company policy statements. These and other case studies are also used extensively in the text for illustrative purposes. The most interesting examples, however, come from the author's own experience with circulation planning for *The National Observer*.

Although written primarily as a text for college courses in "business policy," this book has value for the businessman who is uneasily conscious that he is not doing enough planning—or who is simply curious to know what long-range planning is all about.

The Repurchase of Common Stock by CHARLES D. ELLIS and ALLAN E. YOUNG, The Ronald Press Company, New York, 1971, 212 pages, \$12.

Repurchase by corporations of their own common shares has reached such a scale in recent years that it has become a significant factor both in the securities markets and in corporate financial management. These authors examine the why and how of the phenomenon and its implications.

In the 1950s and 1960s companies repurchased a growing quantity of their common stock. In 1965 nearly \$2 billion was spent for this purpose by companies listed on the New York Stock Exchange, substantially more than the \$1.5 billion received by all U.S. corporations through the sale of common stock in that year. This was the second year in which the net effect of corporate activity on the capital markets was to supply equity capital to these markets rather than, as is more traditional, to demand funds from them. The trend seems to have leveled off in the 1970s, but the volume remains significant.

In this book the authors, a vice president of Donaldson, Lufkin & Jenrette, Inc., and a professor at Syracuse University, provide a scholarly analysis of this trend.

Their primary focus is naturally the effect upon the securities markets, but they also devote ample space to the implications of this practice for financial management, the topic with which financial executives are chiefly concerned.

Many possible reasons for stock repurchase are suggested by the authors. The fact that stock repurchase has been growing at a faster rate than expenditures for the payment of dividends or for gross additions to plant and equipment suggests to them that tax laws may have led companies to seek to distribute profits through this mechanism rather than through dividends. Corporate dividend payouts have generally declined since 1954, supporting the thesis that companies have sought to channel profits to stockholders in a tax-favored way.

High interest rates factor

Since 1959 the availability of internally generated funds has exceeded expenditures for dividends and for plant and equipment by an increasing margin. Thus, "large-scale repurchases by corporations of their own common stock constituted a natural response on the part of financial management to the need to develop new uses of corporate funds. . . . From 1961 on, when the extent of the excess of sources over uses began to grow at an increasing rate and to reach significant proportions, it was necessary to avoid a buildup of increasing amounts in liquid low-earning or non-earning assets because of the effect this would have on the overall rate of return on total assets."

High interest rates also have been a factor. Corporations can increase their financial leverage without issuing high-interest debt or calling in low-interest debt if they reduce their equity capitalization through repurchase of common stock.

And the increasing emphasis on earnings per share has influenced financial management to take this

measure as a guide. One way, of course, to increase earnings per share is simply to decrease the number of shares.

Other, more specific, reasons have influenced specific managements at particular times. Foundations (such as the Ford Foundation) closely tied to particular companies have diversified their holdings without driving down the price of the stock by selling shares back to the issuing company. The growing trend to issue convertible securities has led companies to acquire reserves of common shares with which to accomplish conversions. Other companies have bought up their own shares for future use in merger transactions and to provide a supply of stock to maintain stock option and employee stock purchase plans. Some have simply sought to reduce stock servicing costs by buying out small shareholders, since the cost of servicing a stockholder is relatively constant however many shares he owns.

This trend has not gone on without criticism. A number of arguments have been voiced against repurchasing; the authors identify five major ones:

- Financial "classicists" generally recommend repurchase "only as a means of gradually liquidating a deteriorating company or one with wasting assets."

- Buying in common stock, for some, has "the unfavorable connotation of defeatism and implies that a management not finding ways to use surplus funds is inept and dull-witted."

- There is still a widespread management preference for equity over debt capital, although the authors consider this preference irrational in many cases.

- Many warn against the possibility of abuses of the ability to repurchase shares—battles over control, manipulated share prices, etc.

- Some have argued that either the sellers of repurchased stock or the remaining holders must be hurt by a repurchase transaction and that management should not help

some stockholders at the expense of others.

All five of these arguments against repurchase the authors find "quite general, often vague, and usually suggestive of possible problems rather than descriptive of actual difficulties. On the other hand, the reasons advanced in favor of repurchasing are pragmatic and specific."

The authors go on to examine repurchasing techniques and procedures, the legal and regulatory constraints that bear upon the repurchase decision, and the accounting aspects of repurchasing. Finally, they consider the impact of large-scale repurchasing upon the efficient operation of the capital markets and upon the movement of security prices. They weigh the benefits and abuses of repurchasing in terms of the public interest and make suggestions for public policy.

This is a timely and scholarly study of an important topic. Accountants, and financial executives as well as professionals in the market should find it both useful and interesting.

[See "Practical Considerations in Common Stock Repurchase," page 35, this issue.]

SAFE: Security Audit and Field Evaluation for Computer Facilities and Information Systems by LEONARD I. KRAUSS, Firebrand, Krauss & Company, Inc., P.O. Box 165, East Brunswick, New Jersey 08816, 1972, 284 pages, \$24.95.

This little looseleaf manual consists chiefly of a set of forms for use in evaluating EDP security.

Despite the headlines given to bombings of computer rooms, for the average computer user security involves attention to more mundane concerns: accidental or malicious destruction of computer facilities or computerized records; lawsuits and loss of revenue and goodwill resulting from computer error; fraud and embezzlement; industrial

espionage; and the problems of negligence and human error.

This manual outlines a procedure for evaluating security on all these fronts and presents a set of forms—in checklist style—for evaluating existing systems in eight classifications: personnel; physical security; data, programs, and documentation; operations; backup; development; insurance; and security programming. The checklists, in questionnaire form, also provide a weighting system for measuring the degree of computer safety.

Sufficient forms are provided to evaluate one complete EDP installation. Additional copies can be ordered for use in other installations or for follow-up audits.

Useful basis

Probably only the smallest computer user would want to use this book as is for a computer security audit. Many, however, including consultants, may find it useful as a basis for working out their own systems. The material, the author points out, lends itself to tailoring. Since the solutions to problems uncovered by the audit are not necessarily self-evident, the author also suggests use of consultants in planning for corrective action.

Preparation of this book was an ingenious idea. It would prove invaluable to a data processing manager or consultant seeking to prepare his own first audit.

Measurement and Environmental Deterioration by BOYD COLLIER, Bureau of Business Research, The University of Texas at Austin, 1971, 100 pages, \$3 (paperbound).

This little monograph, a proposal for a new way of setting up national income accounts, is directed more to economists than to accountants. However, accountants who agree with the author that economics could benefit from closer contact with accounting may find it interesting.

Socio-economic accounting has become a popular term in recent years. The author of this little research study invokes it to buttress his proposal for a change in the current method of calculating the national income and product accounts—a change that would, he says, bring accounting and economics together, with benefit to both.

The current national income accounts, this author says, are outmoded because they are based on the theory of perfect competition. He offers, instead, a rough outline of another method, which includes many activities now omitted from national income (i.e., the unpaid work of housewives) and which introduces the idea of disproduct, or negative product. The basic system of valuation used is that developed by John Dewey; the attempt is to view the economy as a “cybernetic system.”

Dr. Collier's would-be system is not really developed enough for the Government's economists to take it over as a substitute for the present one, even if they were minded to. Some of his ideas are provocative, however, and his attempt to find common ground between economics and accounting is a worthy one.

Computers in Knowledge-Based Fields by CHARLES A. MYERS, The MIT Press, Cambridge, Massachusetts, 1971, 136 pages, \$10 (cloth-bound), \$2.95 (paperbound).

This little report reviews the use of computers in five non-business fields: education, libraries, the law, medicine, and local data banks.

This study is the last in a series of research projects (see M/A September-October, '71, p. 57) on the implications of technological change and automation undertaken by the Industrial Relations Section of the Sloan School of Management at MIT in an effort supported by the Ford Foundation and others.

The report takes a quick look at the progress made through 1969 by

applying computers in five specific areas outside business: formal education and educational administration; library systems and subsystems; legal, legislative, and related services; medical and hospital services; and national and centralized local data banks.

Little original research

The result basically is not much more than a condensed transcript of material that could have been received from a press clipping service. Various applications in each field are described briefly. Each is allotted space in apparent proportion to the amount of published material the researchers had about it rather than in proportion to its importance.

The exceptions are applications in or near Boston; there, apparently, the budget allowed for some research, and they are reviewed in some detail. Applications outside Boston get a sentence or two each, sometimes with a note to the effect that the current status of the project is not known.

Nearly as much space is devoted to the conclusions as to the information, and the conclusions are completely predictable (as well as being nearly identical in all cases): Some, but not much, progress has been made with computers in all these fields. Predictions of revolutionary change continue to be made, but their realization seems to be remote. Progress has been held back by economic factors and by the conservatism of professionals in the various fields. These professionals, however, will not be displaced but rather will be helped by computerization if it ever comes.

Useful in specific areas

This rather casual research effort contains nothing that people who keep up with the fields concerned do not already know. It might be of value in supplying leads for further investigation to someone newly concerned about the use of computers in a particu-

lar area, for example, a consultant with his first hospital or library client.

Briefly listed

An Introduction to the Theory of Statistics by R. L. PLACKETT, Barnes & Noble, Inc., New York, 1972, 204 pages, \$5.50 (paperbound).

Designed as a first textbook in mathematical statistics at the college level, this British import also might be suitable for review by the accountant or businessman whose mathematics has rusted a bit. In addition to the essentials—probability theory, discrete and continuous probability distributions, properties of variates, calculus of distributions, random samples, and statistical inference—the author includes some other techniques he considers most useful in practice—variance analysis, regression analysis, and frequency analysis.

Motivation and Management Development by ROBERT E. TENNEHILL, Auerbach Publishers Inc., Princeton, New Jersey, 1970, 207 pages, \$9.50.

The development of managers should be based on the concept of teaching and leading the staff in an environment conducive to learning, according to this author, a consultant in this field. He deals with such questions as how to create a motivational climate, how to improve communications, and how to develop a more constructive attitude toward learning and skill improvement among staff members.

Readings on the Current Social Issues in Business. FRED LUTTHANS and RICHARD M. HODGETTS (Editors), The Macmillan Company, New York, 1972, 312 pages, \$5.25 (paperbound).

This collection of 34 articles by 31 authors emphasizes the social responsibilities of business, particu-

larly in the areas of poverty, civil rights, ecology, and consumerism. Specific topics include the philosophical and ethical foundations of business, the corporate form of organization, the urban crisis, employment of minorities, and manpower programs.

Discrete Optimization: Integer Programming and Network Analysis for Management Decisions by DONALD R. PLANE and CLAUDE McMILLAN, JR., Prentice-Hall, Inc., Englewood Cliffs, New Jersey 07632, 1971, 247 pages, \$13.50.

Books abound on linear programming, from those at the most advanced level to those at the most primitive level. This is not true of integer programming. That is the reason for this book, an attempt to provide students of managerial analysis and other nonmathematicians with an introduction to integer programming. The mathematical background required is "quite modest" (no calculus or matrix algebra), but the book does require a willingness on the part of the reader "to use symbols, algebra, and ordinary reasoning." Understanding of linear programming is assumed, but an appendix is provided to bridge the gap if there is one.

Interviewing Skills for Supervisory Personnel by LAWRENCE L. STEINMETZ, Addison-Wesley Publishing Company, Inc., Reading, Massachusetts 01867, 180 pages, \$4.95 (paperbound).

Aimed at managers and supervisors, this book outlines the basic types of interviews (information gathering, information giving, and problem solving) and some of the basic techniques (directed, nondirected, and stress interviews). Guidelines are provided for employment interviews, counseling situations, disciplinary interviews, performance appraisal and review conferences, and exit interviews. The book was designed as a companion to a film-strip series on interviewing skills

but can be used independently.

A Practical Guide for Supervisory Training and Development by DONALD L. KIRKPATRICK, Addison-Wesley Publishing Company, Inc., Reading, Massachusetts 01867, 1971, 182 pages, \$8.50.

This book aimed at line managers as well as training directors, emphasizes the how as well as the why of supervisory training and development. The author examines the latest research and writing and offers guidelines buttressed by case studies. A section on selection of potential foremen and supervisors is included. The book is sponsored by the American Society for Training and Development.

Meeting the Challenge of Supervision by MERLE C. NUTT, Exposition Press, Inc., 50 Jericho Turnpike, Jericho, New York 11753, 1972, 297 pages, \$10.

Aimed at the first-line supervisor, this book tries to cover everything a supervisor should know: attributes of a good supervisor, delegation of authority and responsibility, decision making techniques, human relations, motivations, incentives, dealing with unions (bargaining, grievances, arbitration), safety, and employee development. There is a chapter on problems of the construction industry.

Early Retirement Programs, Conference Board Report Number 532, THE CONFERENCE BOARD, INC., New York, 1971, 42 pages \$5 (paperbound), (\$1 to Conference Board associates, students, and teachers).

This report of industry practice is based on a survey of 841 pension plans of 641 manufacturers. Topics covered include eligibility for early retirement, benefits, early retirement experience, age and service requirements, company-consent requirements, comparative benefit levels, supplements, early retirement rates, and trends.

MAGAZINES

MIS Is a Mirage by JOHN DEARDEN, *Harvard Business Review*, January-February, 1972.

The title of the article tells part, but not all, of the story. Professor Dearden methodically attacks the premise of a viable, company-wide, centralized information system but then he suggests a plan that could largely reach its objectives.

The thesis of the article is that each functional area of a typical company is so different in nature from each of the others that it is impossible to create one universal information system meeting the needs of all of them. If the term MIS were taken to mean only those information systems that are computer-based, Professor Dearden would have no quarrel with it, but he points out that most people mean something far more all-embracing when they use the term MIS.

MIS within each function

Each functional area of the company does have its own MIS for its particular area, he says; if it's a healthy company each has interfaces with the other areas where needed basic information is exchanged. Using the automobile industry as an example, he suggests the development and introduction of a new car model as an example of various functional information systems within specific areas—styling, engineering, product planning, finance, facility planning, procurement, and production scheduling—each doing its own job and still exchanging the information needed by each of the other functions at the proper time. The system works well within a strict time frame but it is not in any sense a centralized management information system, Professor Dearden insists.

Devising a centralized management information system—as the

phrase is generally understood—simply demands too much expertise in too many fields, he believes. The information needs of the financial accounting and control system are entirely different from those of the marketing system just as marketing's information needs are entirely different from those of legal services, industrial relations, and public relations. R & D has data needs unknown in other areas. It is too much to expect one man to be expert in all these areas.

Why not pool knowledge?

All right, then. Why not have a group of experts, one from each area, pool their knowledge to create an overall system?

Because it would increase the problems of coordination of information, Professor Dearden asserts. The information systems for such complex functions as marketing and production would be the responsibility of the staff group rather than the line executives who must actually manage marketing and production; "... if any of the MIS people are competent to tell the functional experts what to do, they should be in the functional area," the author asserts.

That sentence becomes the focus of his recommendations. The principal cause of dissatisfaction with present information systems is that they have incompetent or ineffective people in charge of them, Dr. Dearden believes. If they are retrained or replaced, the most serious management information problems would disappear, he believes.

He suggests that any company really worried about its internal information system ask itself these questions:

Is there adequate communication between individual groups at all important interfaces?

Does each group involved in an interface know enough about the other interfacing systems to do its job effectively?

Professor Dearden then recommends a group of semi-autonomous information systems for a com-

pany's organization. A central computer group would have control over all computer-based information systems. The controller, the treasurer, the computer and systems group, the legal office, the industrial relations office, and organization planning would each report to an administrative vice president, who would coordinate their activities, and serve as a transfer point for information that each of them needs from the others. The marketing, manufacturing, and R & D functions would continue to be independent and responsible for their own information systems.

Thus, in his ideal company, each function would continue to have its own information system, with interfaces among the functions reporting to the administrative vice president under that officer's direction.

In other words, the emphasis throughout would be on people, skilled people, and information checkpoints or interfaces between functional areas. Dr. Dearden sums up the main recommendation of his article in the sentence:

"Place competent people in each of the formal information systems."

A Unified Approach to the Theory of Accounting and Information Systems by CLAUDE S. COLANTONI, RENE P. MANES, and ANDREW WHINSTON, *The Accounting Review*, January, 1971.

Most approaches to the design of accounting information systems have concentrated on either increasing the efficiency of computer usage through modification of the double-entry system or the extension of conventional accounting systems to include more diversified information. In this article the authors suggest a binary coding and storage technique which provides both efficient computer usage and multidimensional data files.

Every individual event of decision-making relevance to a firm

may be assumed to be sufficiently described by a subset C' of a finite set of characteristics, $C = \{c_1, c_2, \dots, c_n\}$. For example, a raw material purchase might be described by quantity, date, supplier, amount paid, material type, etc., while a customer complaint would be described by a different selection of characteristics. For each type of transaction, each characteristic from the universal set of n characteristics is either relevant or not relevant. This leads to a unique binary code for every transaction type; this binary code can be converted to a decimal equivalent. An event having K decision-relevant characteristics would be described by $K + 1$ ordered elements, as follows:

(Characteristic code, X_1, X_2, \dots, X_k),

where X_1 is the value of the first relevant characteristic, etc. This allows multi-dimensional description of events without requiring that each event be described in the same n -dimensional space.

Given a data base organized in the above manner, a generalized definition of an account is formulated. If S is the set of possible account codes, then an account is simply a subset of S . By a slight extension, a chart of accounts is defined as a partition of S . In this manner it is possible to define a conventional double-entry chart of accounts, but other groupings may also be defined as required.

The authors then discuss a few important matters of implementation. First, they indicate how data coded as above might be stored according to a tree-like structure, providing efficient retrieval based on the presence or absence of given characteristics. They then discuss the possibility of data links between recorded events. For example, a cash receipt could be linked to a related sale on account, or all occurrences of a particular characteristic could be linked. Finally, they show how an easy-to-use retrieval language ("key algebra") could be developed. A few cost and benefit issues are discussed in gen-

eral terms, but no attempt is made to show the feasibility of the proposed system under practical conditions.

This is *not* a how-to-do-it article. Practical issues are discussed in general terms or are omitted entirely. What the authors *have* done is to provide a stimulating framework for thinking about the problems of information coding, storage, and retrieval. On this basis it is well worth the time of a "practical" man.

ROBERT W. HILL

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Making Management by Objectives Work by R. STUART-KATZKE, Canadian Chartered Accountant, October, 1971.

The implementation of a management by objectives system is most successful when the organization has been prepared for the significant change from an emphasis on inputs to an emphasis on outputs. A case study of implementation of an MBO system is also reported.

Management by objectives is defined as "a system of management which focuses on the outputs of managerial positions." The MBO managerial system requires managers to establish objectives *before* they initiate the action to reach these objectives. In contrast, often the general pattern of management may be to focus on immediate problems and spend little time on planning for the future. Under MBO, the objectives are established at each organizational level by superior-subordinate meetings at the beginning of each period. The success of the objective-setting meeting is dependent upon the agreement to objectives which are mutually satisfying to both parties. Individual responsibility for objectives must be clear and each individual must have the necessary authority to perform the actions required to attain the objective. If

these two characteristics do not exist at the subordinate's level then the goal is unrealistic and the use of the goal as an evaluative means at the end of the period is useless.

The author notes an effective MBO program can benefit an organization in a number of ways: (1) it focuses managerial effort on a common point by establishing and directing managerial objectives from the top down, leading to a greater unity of purpose and effort in the organization; (2) it provides a framework for coordinated effort among managers by preventing overlapping objectives and, therefore, eliminating many of the destructive forms of competition between different segments of the business; (3) it provides objective reward criteria by relating rewards to the successful attainment of objectives; (4) it clarifies responsibility lines for the individuals in the managerial system; (5) it points out organization development needs by the rapid feedback on problem areas; and (6) it benefits individual managers by the knowledge of the criteria used in evaluating their performance.

A major cause of failure of MBO to realize its potential benefits has been the improper advance preparation of the organization. Management often has not treated MBO as a significant organizational change and has instead attempted to force the change upon its organization. The author states that "unfreezing" a frozen or rigid organization prior to change and "refreezing" or reinforcing the new set of values after the change can eliminate many of the reasons for failure. Other reasons for failure include: (1) the use of MBO solely as an appraisal system and not as a planning system; (2) a lack of commitment to MBO at the top management level; (3) the failure to relate the reward structure to outputs; and (4) a low level of trust between the superior and the subordinate which will prohibit a frank discussion of goals in the objective-setting meeting.

The management team of in-

dividuals from all levels of the organization must be given time to adjust to the new system and practice the techniques of interaction and communication so essential to the effective implementation and operation of the MBO system. The setting of meaningful, attainable goals with the subordinate, which the superior can coordinate with the goals he has established for himself, may require a sharpening of communication skills and a greater use of creativity by the manager.

Three stages

The author presents a case study of a medium-size firm which has been implementing an MBO managerial system. There are three stages to its program of organizational change.

The first stage began with a series of one-week training seminars which were attended by all managers beginning from the top and moving down. No superior-subordinate pairs attended the same seminar. This gave the participants an opportunity to voice their personal concerns with the proposed changes. The theme of the seminar was how to increase the individual's *effectiveness* in the work environment. The order of attendance, top-management first, was important since as a manager returned from the seminar, his superior could reinforce the manager's attitude toward change.

The second stage of the program was a series of three-day, team-building seminars attended by a manager and his immediate subordinates. The theme of these seminars was the role of the "team" in the organization and the role of each member on the team. The first stage produced a favorable attitude towards change by relating it to increased effectiveness and the second stage built upon this foundation by specification of team objectives which would lead to increased effectiveness. The team concept was reinforced as each manager met with his immediate sub-

ordinates and, in turn, each of these subordinates met with his immediate subordinates. This device provided a "linking-pin" effect as each individual participated on two teams, first as a subordinate and then as a superior. This also provided continuity of goal structure through the organization.

The third stage involved meetings between the superior and each individual subordinate to establish a clear set of objectives for each subordinate. Also, a precise plan of action designed to achieve the objectives was mutually agreed upon. This third stage must be developed in an atmosphere of mutual trust and the goals should be attainable or the previous two stages will be worthless.

It is the third stage which presents the greatest challenge to today's managers but this stage is essential to the individual's acceptance or rejection of the MBO managerial system. The experiences from the first two stages must be such that openness to change has been rewarding and that this openness is backed by top management.

RICHARD E. BAKER

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Madison*

Introducing a New Work Measurement System-MODAPTS by ROBERT J. SHAW, *Management Controls*, April, 1971.

This article describes a new system similar in nature to Methods-Time Measurement (MTM), which was developed in the 1940s to objectively determine the length of time a job should take. The author is a principal in the New York office of the accounting firm of Peat, Marwick, Mitchell & Co., which is one of the two licensees of this Australian-designed system.

There are two basic work measurement methods in industrial use today—stop watch time study and predetermined time standard (PTS) systems, such as MTM and Master

Standard Data. The fact that stop watch studies are still widely used is an indication that there must be some dissatisfaction with the PTS systems currently available and that a substantial market exists for a new system which would avoid the sources of this dissatisfaction.

Simplicity, productivity claimed

The advantages claimed for stop watch measurement over current PTS systems are mainly in terms of simplicity and productivity (the rate of producing standards). These are precisely the areas of improvement claimed by Mr. Shaw for MODAPTS (Modular Arrangement of Predetermined Time Standards). This system was not designed to give more accurate time standards, but to improve the simplicity and efficiency of use, while maintaining a reasonable level of accuracy. Only 21 basic body movement activities are defined in this method, as compared to hundreds in other PTS systems. Supposedly, the expression of all possible body movements in terms of multiples of a simple finger movement called a MOD can adequately allow this condensation of categories without serious loss of comprehension. Unfortunately, the reader will either have to accept this on faith or avail himself of the services of PMM & Co., because the evidence contained in the article is limited to a statement that "tests and instructional experiences support the reports of users that the benefits of MODAPTS are simplicity of training, ease of application, economy of operation, improved understanding of controls, and development of standards of a high level of accuracy."

If we tentatively accept the contention that the accuracy is adequate, we can look more closely at the claimed advantages of simplicity and efficiency of operation. MODAPTS does not require the use of highly skilled technical personnel and includes a programmed instruction manual designed to provide an adequate training course which can be completed in one week.

Along with an explanation of the MODAPTS data card, the manual helps the trainee to recognize and properly classify body activities in order to apply the appropriate MOD value. It also covers such topics as the philosophy of work measurement, allowances, standard data development, and labor reporting. The author claims that once proficiency is attained through a few days of actual experience following the training program, the "average analyst" can develop consistent time standards within minutes after observing or simulating an operation—sometimes even matching the speed of the stop watch method.

If the speed and simplicity of the stop watch method can be approached, a PTS method would be clearly attractive because the former only works from observation and is not likely to lead to methods improvement opportunities such as can be developed from the detailed movement pattern information that can be generated by use of PTS systems. If MODAPTS can deliver the advantages claimed by its sellers, it may well have a receptive market.

DONALD H. WORT
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The Credit Card's Painful Coming-of-Age by IRWIN ROSS, *Fortune*, October, 1971.

Irwin Ross delves into the \$10-billion credit card industry and relates some of the major problems in system and operation that still have it looking for respectable profits.

The author traces the history of the credit-card revolution from the brainchild of the late Frank X. McNamara, who founded Diners' Club in 1950, to date. Today there are 275 million credit cards of all types: 55 million bank cards, 90 million oil company cards, 120 million retail store cards, and 11.8 million miscellaneous cards for travel,

entertainment, and car hire. In 1970, charges topped \$7 billion on bank cards alone.

In spite of its many triumphs, the industry profits have been elusive. Diners' Club lost over \$70 million in the last 27 months. Carte Blanche lost \$2,675,000 in 18 months and finally emerged in the black last June. American Express speaks of increasing profits but the figures are buried in the overall accounts. The banks too, have been losing money. Wells Fargo lost \$7,000,000 from its card introduction in 1967 through 1970. Modest profits are now expected. New York's Bankers Trust lost \$5.4 million in 1969, \$3 million in 1970, and \$1,200,000 in the first six months of 1971. In 1960, when the Bank of America started its statewide operation, it lost almost \$9 million.

Accounting confusion

Only the bank and T and E (travel and entertainment) cards were intended to return a profit. Oil company and department store cards are used primarily as marketing tools.

The accounting techniques utilized vary among the banks and the T and E companies to such an extent as to make comparisons difficult. Some banks charge their card operations for the use of money, others do not. American Express does not publish separate profit figures for its card operations although billings are known (\$2.3 billion in 1970). Translating volume into bottom-line earnings is a tricky job involving many variables in revenue and expenses that are rarely found in other businesses. These are often erratic and extraordinarily difficult to control. Some card companies charge the cardholder, some charge the merchant, some charge both. Still others charge carrying charges on unpaid balances.

One of the most acute problems of the credit card business is deadbeats. The general economic decline of 1969-70 resulted in an enormous increase in delinquencies

which accounted for much of Diners' and Carte Blanche's deficit. Banks and oil companies used mass unsolicited mailings as the cheapest way to build their rosters. This compounded their credit-loss problems. Another problem is fraud. A credit card is highly portable and valuable. Many cards are stolen from the U.S. mails and credit card companies as well as individuals. Many are sold on the black market. Many cardholders go on buying sprees. One gang took Diners' Club for \$621,000.

Many of the profit problems appear to emanate from inadequate planning, inadequate systems, and insufficient thought given to adequate controls. As the author states, ". . . in this high-volume, high-velocity business, a slippage of control quickly leads to disaster." Most of the companies and banks have taken steps to remedy their problems. Some bypass the post office and require customers to pick up their new cards at the bank. Computer systems have been sophisticated to call attention to buying sprees. Others have strengthened credit investigations and set more stringent credit limits. Merchant "print-outs" are being published more frequently to detect fraudulent purchases or collusion.

For 1970, banks in the Federal Reserve system reported write-offs of 3.39 per cent compared to 2.38 per cent in 1969. The trend is now down with Bank of America reporting 1.77 per cent for its first quarter of 1971 as compared to 2.4 per cent in its last quarter of 1970.

Under the direction of good management, credit and fraud losses are coming under control and potential profits begin to loom on the horizon. As the author states:

In the early stages of a credit-card program, the emphasis is on marketing . . . Proper paperwork procedures and adequate controls come later, after management is shocked by high losses.

The author concludes that the

going has been tough for the banks because of the resistance of customers to the 18 per cent carrying charge. Some banks are proposing a yearly fee for the card. On the other hand, many bankers consider their credit card venture as the R & D project toward the "Cashless Society."

Raises questions

The article is well written and should be of interest to all systems analysts, public and private accountants, and executives contemplating entering the volume credit-card arena. The article raises many important questions that must be answered if any such venture is to be profitable. Why should there be heavy credit losses the first five years? Many department stores and mail order companies have had successful credit operations. What is their secret? Many major computer installations venture into new systems without adequate management participation, thus leaving many major decisions in the hands of technicians. Certainly adequate planning and proper utilization of modern tools to weigh the pros and cons of various courses of action should be a "must" in any major venture. Accountants would obviously be interested in the effects of such ventures on the proper valuation of receivables and potential losses in the financial statements.

AREN A. LEWIS

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Long-Run Curves: A Comment by ROBERT W. MITCHELL, *The Journal of Industrial Economics*, November, 1971, and **Cost Function, Concentration, and Barriers to Entry in Twenty-Nine Manufacturing Industries of India: A Comment and Reinterpretation** by JOHN A. WALGREEN, *The Journal of Industrial Economics*, November, 1971.

In the absence of theoretically perfect data, economists use ac-

counting and other available information—and sometimes arrive at different conclusions from the same data.

A survey of 29 manufacturing industries was made by Vinod K. Gupta using the information available from the Census of Indian Manufacturers. His findings, published in *The Journal of Industrial Economics*, have attracted critical comments from other economists and a reinterpretation of the data used by Gupta has led one of them to arrive at a widely different conclusion.

The first conclusion drawn by Gupta in his article was that in a large majority of the industries under study, the long-term cost curve is either L-shaped or linear, and it is U-shaped in a very few industries. This means that in a majority of industries economies of scale exist, but diseconomies of scale do not exist. Even though this finding is corroborated by findings in many industries in other countries also, it is in sharp contrast with the traditional assumption made by economic theorists about a U-shaped long-term cost curve, and has been objected to by one of Gupta's two commentators.

Normal returns not considered

Robert W. Mitchell points out various limitations which must be placed on the above mentioned conclusion. One of the points made by him is that in calculating costs Gupta has made no allowance for a "normal" rate of return on investment; Gupta, however, thinks that the theoretical concept of normal profits is not operational, nor is their inclusion in costs essential to a study of cost comparisons at different scales of production in an industry. Mitchell also points out the possibility that scale economies may be absorbed as "managerial slack" and thus not appear in cost data.

Gupta's second finding relates to the desirability of concentration and monopoly power. He concludes

that if we want efficiency in production and distribution, the present degree of concentration and monopoly power cannot be avoided in most of the industries in which it exists significantly.

Gupta also found that in a large majority of industries, barriers to entry due to the presence of scale economies are not very strong. From his analysis, however, he could not arrive at a firm conclusion about the existence of a positive association between the rate of profit and the height of these barriers to entry.

High barrier, large profits

John A. Walgreen undertook a reinterpretation of the data used by Gupta and arrived at a significantly different conclusion in this matter. He regrouped the industries according to their concentration ratio. On this basis, he found that the average profit rate of the group of industries having "very important" economies of scale was 50 per cent larger than the average profit rate of the group of industries where economies of scale were only "moderately important" or "unimportant." These results are consistent with those obtained in certain studies of United States industries. Walgreen, therefore, concludes that the height of the barrier to entry may be an important structural determinant of industrial performance in less developed countries, as well as in developed countries.

SURENDRA P. AGRAWAL

University of Florida

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