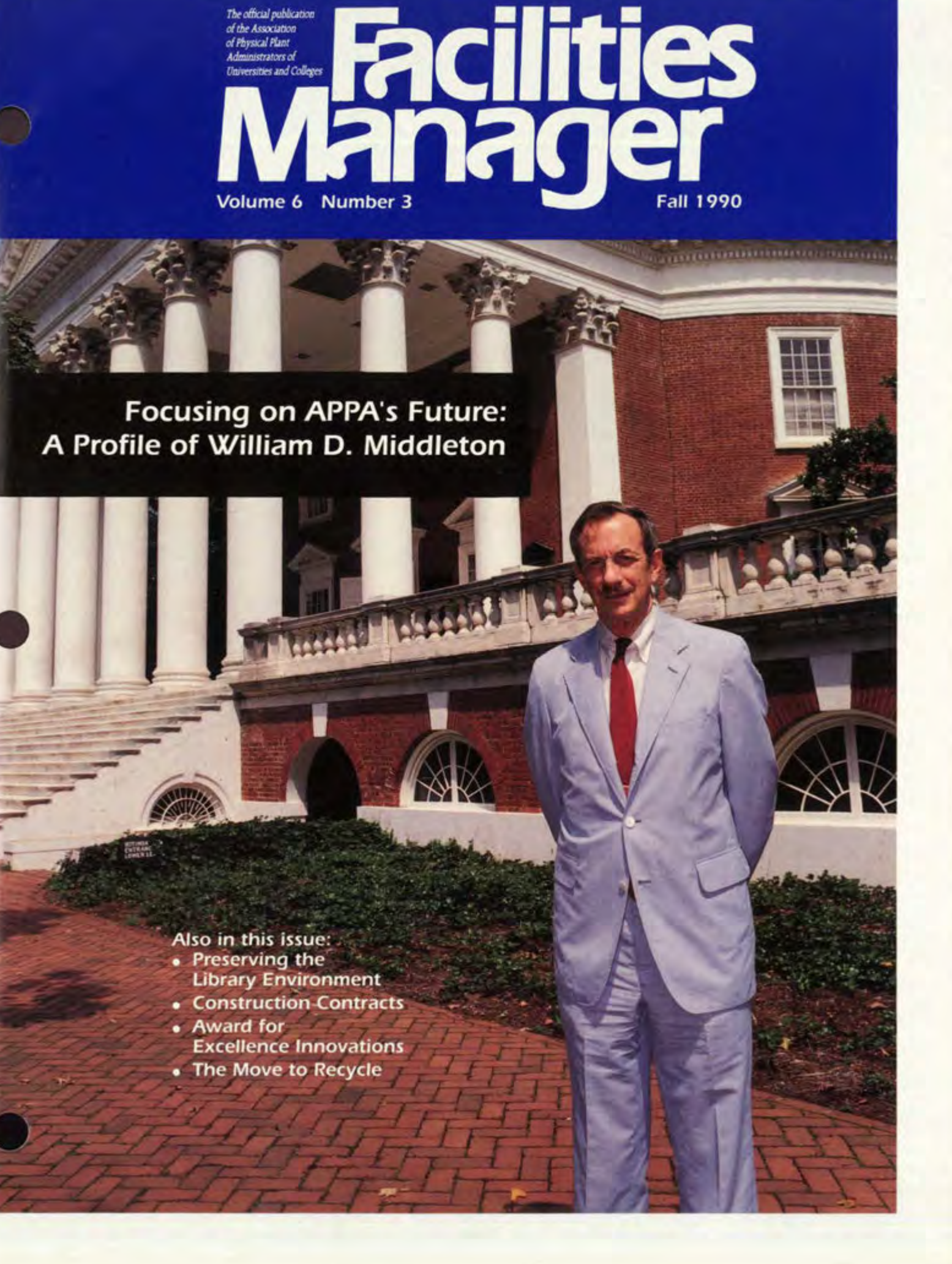


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of Physical Plant
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Facilities Manager

Volume 6 Number 3

Fall 1990



Focusing on APPA's Future: A Profile of William D. Middleton

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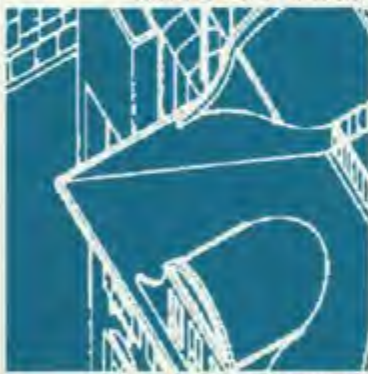
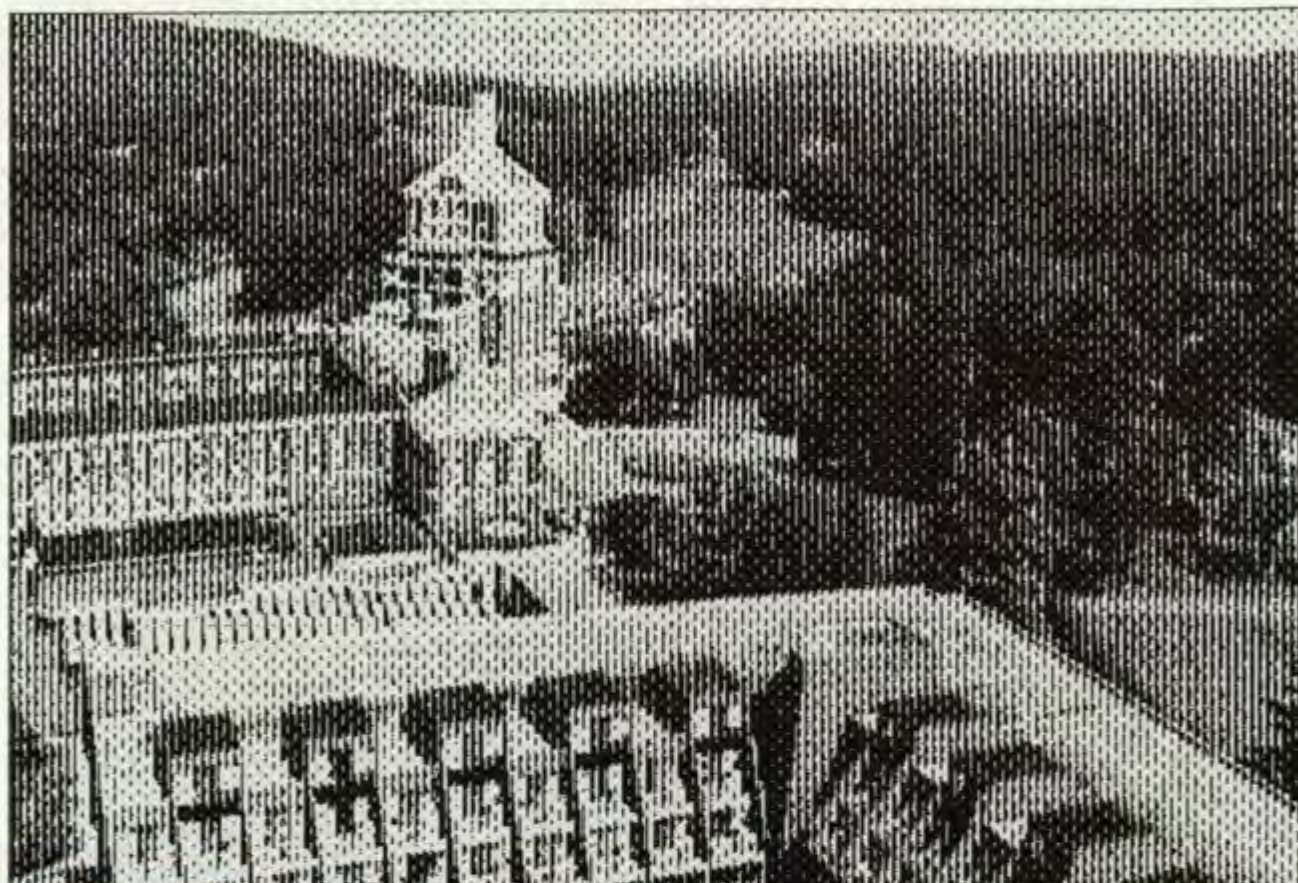
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APPA UPDATE

NEWS FROM THE ASSOCIATION OF PHYSICAL PLANT ADMINISTRATORS OF UNIVERSITIES AND COLLEGES

APPA Makes Aggressive Move in Governmental Affairs Arena

by William D. Middleton

APPA President and

Walter A. Schaw

APPA Executive Vice President

In an unusual display of consensus and unanimous action by the APPA Board of Directors and regions, APPA moved to create a governmental relations staff position at its annual meeting in Ottawa last July. Responding in part to a demonstration of APPA's opportunities and a strong member interest, the Board requested that the proposed new service be discussed and voted on in meetings of each region at the Ottawa meeting.

The proposed new service as explained to the regions would include a permanent staff professional and part-time staff support to work with both legislative and regulatory agencies that affect facilities in higher education. The activity as proposed would be financed by a 15 percent across-the-board dues increase in APPA fiscal year 1990-91, which will provide \$75,000 in full funding.

The regions gave positive and enthusiastic response, causing the Board to move with full consensus in approving the proposal at its July 4 meeting. A job description and detailed program will be reviewed by the Board in January 1991; hiring for this position would not occur until the onset of the new fiscal year, April 1.

Governmental Affairs Closely Tied to Long-Range Plan

The service as proposed is closely linked to the goals of APPA's new long-range plan. In fact, governmental affairs has been called the single major area of the plan that has not had some ongoing development by APPA. One of the most important components of the long-range planning process, conducted by APPA's Planning Committee last year, was a member opinion survey. Distributed last fall, the survey sought members' views on a wide range of key facilities management issues. We learned much from this survey,

and analysis of its results formed some of the most important background to the long-range plan that was approved by APPA's Board of Directors last June.

Environmental and regulatory concerns stood out among all of the issues identified in the long-range plan in two ways. First, they represented one of the most important of all facilities issues to the APPA membership. Even more importantly, it was apparent that this was an area of major concern to facilities managers in which APPA most needed to improve the level of membership service that it was providing.

"This issue screams out of all of the survey results," said Sean Rush of Coopers & Lybrand in analyzing the results of the member opinion survey. Our members ranked support on this issue as one of the most important APPA programs, and also expressed a strong belief that it could be improved. Under "new programs for the 90s" environmental and regulatory concerns was ranked first by APPA members.

In the long-range plan the Planning Committee identified the issue and established related goals in this way:

Issue 5. Regulatory issues affecting facilities management.

— Belief Statement —

The steadily increasing scope and complexity of legislation and regulations related to environmental health and safety represents one of the most important issues facing higher education facilities officers now and over the next decade. Facilities managers must acquire the skills and knowledge needed for compliance, and they should have a voice in the formation of legislation and regulations.

Goals for Issue 5:

1. To develop capabilities required for effective compliance.
2. To participate in the formation of legislation and regulations.

APPA's Grassroots Campaign

The proposal was a direct result of not only the long-range plan and the member survey, but also a demonstration of the opportunities available to APPA by recent developments promoted by Walt Schaw and Wayne Leroy. In late May, APPA was invited to comment on facilities issues by a group of government relations officers representing higher education in Washington.

As a result of the meeting, APPA was authorized to become the lead agent for higher education in influencing facilities programs, particularly in low-cost loans authorized by the Congress and funded at \$25 million in FY90. Our goal was authorization of \$100 million. A second goal was (and is) authorization of \$250 million in National Science Foundation funds for research facilities.

The time frame was only four weeks from the onset of an APPA grassroots campaign, which utilized APPA members, and the target for markup by the House Appropriations Subcommittee responsible for the recommended appropriation. APPA's effort targeted key committee members in the U.S. House and Senate.

The results of the campaign for low-cost loans did not achieve \$100 million in the final subcommittee appropriations proposal. However, an earlier plan to reduce the fund from its current \$25 million to only \$5 million was changed instead to \$30 million for next year. The language of the bill contains an unusual explanation: "The Committee has restored the borrowing authority for new loan commitments this year in an effort to respond to the overwhelming demand for these construction funds by colleges and universities."

APPA has been credited as a major influence in gaining this recognition and action for higher education's facilities needs. As a result, Schaw and Leroy were commended in a letter to APPA by Charles Saunders, vice president for government relations at the American Council on Education.

(cont. on p. 4)

Inside APPA

(cont. from p. 3)

Less evident were results from our campaign to also gain Congressional awareness of the mounting cost to facilities for higher education's compliance with federal regulations. An APPA fact sheet, derived from a sampling of 90 institutions, shows a potential cost of more than \$30 billion being added to the \$60 billion capital renewal/deferred maintenance crisis. The APPA document points out that some institutions have had to forego planned reductions of work backlogs in order to pay for compliance. This effort will continue with Congress as the opportunity arises.

It was noted in the Executive Vice President's Report in the 1990 Annual Report that the opportunity to participate in federal relations is in large part due to a new level of regard enjoyed by APPA in the higher education community. However, efforts such as the June campaign for appropriations cannot be maintained by the existing staff, but they could be regarded as demonstrations of a service that could have substantial dividends for our members and their institutions.

The prompt and decisive action that our association has been able to take to respond to this increasingly important need of our membership represents yet another example of the ability of our Board of Directors to provide decisive direction to our programs, and of our headquarter staff's ability to meet new challenges with initiative, flexibility, and energy.

Group Pushes Quake Code

The National Institute of Building Sciences is pushing for strict seismic codes nationwide, not just in California. The group says that large earthquakes, equal to the one last year in Loma Prieta, California, could hit 46 of 50 states. For more information contact NIBS, 1201 L Street, N.W., Suite 400, Washington, DC 20005; 202/289-7800.

• • •
Has your institution or department received special recognition, or have you undertaken new or innovative projects? If so, please send them to us for possible inclusion in the newsletter. Send all items to Stephanie Gretchen, Editor, APPA

Newsletter, 1446 Duke Street, Alexandria, VA 22314-3492; 703/684-1446, fax 703/549-2772.

Institute Numbers Keep Climbing

APPA set an attendance record for its August Institute for Facilities Management, with 266 participating in the program. Forty-six individuals graduated from the Institute after completing the three-track program.

In addition, two special programs were

offered—Energy and Utilities Management, and Purchasing and Materials Management. The purchasing program was a new offering developed in cooperation with the National Association of Educational Buyers (NAEB). Participants rated the program a success, and it has been tentatively scheduled to be offered again in August 1992.

The APPA Institute features several special programs. Programs currently being offered and their next scheduled dates are as follows:

- Capital Project Planning and Con-

August 1990 Institute Graduates

Congratulations to the graduates of the 1990 APPA Institute for Facilities Management. These individuals have completed the coursework in Programs 1, 2, and 3 of the regular Institute program.

Edward R. Adams, Eastern Illinois University
 Larry L. Beck, Purdue University/Calumet
 Judith H. Beliveau, University of New Hampshire
 Linwood Berry, Cleveland State University
 Joseph B. Carpenter, University of Virginia
 J. Michael Carson, Purdue University
 Victor J. Costa, University of Delaware
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 Marlin E. Rose, Grace College and Seminary
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 Peter Sandberg, St. Olaf College
 Diane Schroeder, University of California/San Diego
 Nelson C. Shifflett, University of Virginia
 Edward Shubert, Rider College
 Larry Simmons, University of Central Florida
 James I. Styers, University of Alaska/Fairbanks
 Arthur Sykes, Peralta Community College District
 Richard P. Tafoya, New Mexico Institute of Mining & Technology
 Don Thornberry, Occidental College
 Erick VanMeter, Purdue University
 Jerry W. Walker, Southern Arkansas University
 Robert Walton, University of Iowa
 Harald Wandel, Rutgers, The State University of New Jersey
 Walter Watson, University of Cincinnati
 Ruby K. Witter, University of California/San Diego

Inside APPA

struction; Remodeling and Renovation Projects—*January 1991.*

- Energy and Utilities Management—*date undetermined.*
- Facilities Management for Housing and Residence Halls—*January 1992.*
- Maintenance Management—*August 1991.*
- Management of Research, Health Science, and Medical Facilities—*date undetermined.*
- Personnel Management and Training—*August 1991.*
- Purchasing and Materials Management—*August 1992.*

Managing Information Systems is a program in development.

Future dates and locations for the Institute include January 6-11, 1991 in Newport Beach, California; and August 18-25, 1991 in New Orleans, Louisiana.

Scholarships Available

Scholarships are available from the Foundation of the Wall and Ceiling Industry for the 1991-92 school year. Each year the foundation gives 15 \$500-scholarships to full-time undergraduates who are pursuing a degree in construction or a related field. For more information contact Kathy Sedgwick at 703/548-0374.

Call for IAQ Papers

The American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) and the International Council for Building Research Studies are sponsoring Healthy Buildings-IAQ 1991, an indoor air quality symposium to be held September 4-8, 1991, in Washington, D.C. ASHRAE would like any authors interested in presenting a paper to send abstracts of 300 words or less by January 5, 1991 to Jim Norman, Manager of Technical Services, ASHRAE, 1791 Tullie Circle, NE, Atlanta, GA

30329. For additional information contact ASHRAE Technical Services Department at 404/636-8400.

Remember

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APPA Update appears in each issue of *Facilities Manager* and features news from the Association of Physical Plant Administrators of Universities and Colleges. APPA is an international association, founded in 1914, whose purpose is to promote excellence in the administration, care, operation, planning, and development of higher education facilities. APPA Update is compiled and edited by **Stephanie Gretchen**.

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Images for Growth The Impact of Facilities Management on Higher Education in America

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Videotapes of the Satellite Teleseminar

The six-hour satellite teleseminar addressed the image of facilities on campus from different institutional perspectives. In a recent survey of higher education leaders by the American Council on Education, facilities ranked as the number two challenge facing administrators in the coming decade. The teleseminar featured key leaders in higher education discussing the importance of facilities to campus image and how institutional leaders can work together to promote excellence on campus.

Tape #1—The Importance of Image (approximately 50 minutes)

Designed for viewing by institutional leaders, including the president, trustees, vice presidents, and facilities officer. This segment focuses on the critical nature of facilities management and recognition of the investment of the physical plant.

Featured speakers: Father Theodore Hesburgh, President Emeritus, University of Notre Dame; Jack Hug, APPA President; Walter A. Schaw, APPA Executive Vice President; Robert Nestle, Michigan State University; and Winthrop M. Wassenar, Williams College.

Tape #2—Achieving a Positive Image (approximately 1 hour, 50 minutes)

Designed for viewing by senior facilities administrators, key facilities management staff, and training personnel. This tape looks at the concept of customer satisfaction in facilities management through case studies of successful operations.

Guest Speakers: Winthrop M. Wassenar, Williams College, and Dr. John J. Kennedy, Department Chairman of Marketing, University of Notre Dame.

Case Studies (Past winners of APPA's Award for Excellence in Facilities Management): Charles W. Jenkins, St. Mary's University; Ronald R. Maassen, Waukesha County Technical College; and Robert Nestle, Michigan State University.

Tape #3—The Image Makers (approximately 2 hours, 20 minutes)

Designed for viewing by training personnel and first-line supervisors. This session focuses on building a base of customer satisfaction in the day-to-day activities of physical plant staff and features case studies highlighting successful training programs.

Guest Speaker: Dr. William P. Sexton, Vice President—University Relations, University of Notre Dame.

Case Studies: Paul Schneller, Indiana University/Bloomington; Polly Pinney, Arizona State University; E. Lander Medlin, University of Maryland/ College Park; and Barb Kunz, Duke University.

Ordering Information

Videotapes are available in 1/2" VHS format. You may purchase tapes separately or buy the package of all three tapes. Each tape is \$75 for members and \$95 for nonmembers. The package of all three tapes is \$190 for members and \$250 for nonmembers. The price includes shipping and handling. Please send all orders to APPA Publications, P.O. Box 753, Waldorf, Maryland 20604.



The Environment

Environmental courses are being offered this fall and winter by Government Institutes in environmental laws, RCRA, hazardous and solid waste, and the Clean Air Act. For more information contact Government Institutes, Inc., 966 Hungerford Drive, #24, Rockville, MD 20850-1714; 301/251-9250.

The Center for Environmental Research and Training (CERT), based at the University of Texas at Arlington, provides environmental training in asbestos abatement, asbestos in buildings inspectors, asbestos management planners, hazardous materials, and indoor air quality. Courses are offered through August 1991. For more information contact Charlotte Pahacek, Center for Environmental Research and Training, University of Texas at Arlington, Box 19021, Arlington, TX 76019-0021; 817/273-3878.

BNA is offering three **environmental law and regulation books**. *U.S. Environmental Laws*, \$58; *Guide to State Environmental Programs*, \$48; and *Toxic Substances Controls Guide*, \$35, are all available from BNA Books Distribution Center, 300 Raritan Center Parkway, P.O. Box 7816, Edison, NJ 08818-7816; 201/225-1900.

The National Conference of State Legislatures offers **books** on a variety of topics including tracking radioactive waste shipments, solid and hazardous waste, and state legislature reports. For more information contact National Conference of State Legislatures, Book Order Department, 1050 Seventeenth Street, Suite 2100, Denver, CO 80265; 303/623-7800.

The University of Houston, Division of Continuing Education is offering **asbestos-related courses** through the fall. The program includes classes for asbestos abatement workers, inspectors, contractors/supervisors, and management planners. Courses are held on the University of Houston campus and cost \$350 per student. For more information contact Division of Continuing Education, University of Houston, Houston, TX 77204-3901; 713/749-7666.

As reported previously in this column and in a *Facilities Manager* article, the **deadline for the elimination of PCB transformers** took effect October 1, 1990. For

information contact TSCA, 202/554-1404.

The Steel Can Recycling Institute is a nonprofit industry-sponsored association that promotes and sustains **steel can recycling** throughout the United States. The association aids colleges and universities, municipalities, counties, and states in creating viable steel can recycling programs. Steel cans, including the #10 cans commonly used in institutional food service, are strong, low-cost, low-energy containers that are already made from recycled steel and are 100 percent recyclable. SCRI also helps institutions with environmental education activities by providing information, literature, articles, and videotapes. For more information contact the Steel Can Recycling Institute, Foster Plaza X, 680 Andersen Drive, Pittsburgh, PA 15220; 800/876-SCRI.

The National Institute of Building Sciences (NIBS) published current guidelines for reducing the level of **radon** in new buildings and homes. *Methods and Techniques for Reducing Radon Levels Within New Buildings* is a 21-page report prepared for the EPA. The report contains methods and techniques in construction, installations during construction of an active soil depressurization system, and the use of techniques to reduce the heat induced stack effect in buildings. The report costs \$10. For more information contact NIBS, 1201 L Street, N.W., Suite 400, Washington, DC 20005; 202/289-7800.

The deadline has been extended for written public comment on the proposed regulation to require corrective action for releases from all **solid waste** management units at facilities seeking permits under the RCRA. The new deadline is November 26, 1990. The public hearings that were originally scheduled for October 1990 will be held in December in Washington, D.C. and San Francisco, California. For more information contact the RCRA hotline at 800/424-9346. Written comments should be sent in triplicate to the RCRA Docket, Docket Number F-90-CASP-FFFFF, Room 2427, U.S. Environmental Protection Agency, Office of Solid Waste (OS-305), 401 M Street, S.W., Washington, DC 20460.

The EPA proposed regulations that

would reduce potential risks from leaking **underground storage tanks**. The proposal would provide a suitable technical framework and avoid delays for issuing corrective action orders when leaks occur. Corrective action could include testing tanks to confirm the presence of a leak, excavating the site to determine the exact nature and extent of contamination, and cleaning up contaminated soil and water. The proposal was published August 15, 1990 in 55 FR 33430.

OSHA published a final rule on "Occupational Exposures to Hazardous Chemicals in Laboratories" in the January 31, 1990 **Federal Register** (page 3300). This rule contains substance-specific regulations and is performance based. The **laboratory standard** requires employers to create and implement a chemical hygiene plan that includes work practices, procedures, and policies that protect employees, according to the NACUBO Advisory Report 90-1. Employee training and information, medical consultation and examinations, hazard identification, respirator use, and record keeping are also provided for in the standard. A chemical hygiene plan must be written by January 31, 1991. For more information contact your local OSHA office or the national office at 202/523-8151.

In the July 24, 1990 **Federal Register** (55 FR 30082) the final rule for RCRA's recommendations of the **Domestic Sewer Study** (DSS) were published. This rule requires that wastes discharged into sewers are adequately controlled. It is designed to prevent harmful pollutants in industrial waste water from fouling operations of publicly owned treatment works (POTWs). These stricter requirements will affect entities that generate 15 or more kilograms per month of waste water into POTWs, according to Robert Barr of the EPA Asbestos and Small Business Ombudsman's Office. This is a one-time notification. The revisions to the regulations include: whole effluent toxicity testing, specific discharge prohibitions, local limits, notification of hazardous waste discharges, spills and batch discharges, individual control mechanisms, and monitoring and enforcement. For more information contact Marilyn Goode, EPA Office of Water, Permits Division, 202/475-9526.

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Association of Physical
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(cont. on p. 12)

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Applicants are to provide a letter of application, a resume, and the names and phone numbers of at least three references, preferably from current or former employers. Application materials, postmarked by **November 1, 1990**, should be directed to:

The Physical Plant Director Search Committee
Eastern New Mexico University
P.O. Box 6000
Roswell, NM 88202-6000

Job Corner

(cont. from p. 11)

nance and administrative problems. Excellent oral and written communication skills. Title/rank/salary: this position is a fixed term academic staff position with a Hays-Hill title and rank of assistant director of physical plant, salary range six. Salary will be commensurate with training and experience. Applications: a letter of application and resume including a least three letters of recommendation should be submitted no later than **November 2, 1990** to: Mr. Bruce Bongers, Chair, Assistant Director of Physical Plant Search and Screen Committee, University of Wisconsin-Platteville, Physical Plant, 1 University Plaza, Platteville, Wisconsin 53818-3099. *The University of Wisconsin-Platteville is an equal opportunity/affirmative action employer.*

Facilities Engineer. East Stroudsburg University is seeking an individual to provide development, organization, and coordination of a proactive facilities plan-

ning, design, and construction contract management program. The position reports to the director of facilities management. Candidates must have a bachelor's degree in architecture or engineering and at least five years of experience administering, coordinating, and construction contract management. Experience in facilities planning, design, and construction in an educational institution and an advanced degree in architecture or engineering is preferred. Professional registration, or to be eligible for registration, in the state of Pennsylvania is required. Demonstrated leadership ability, excellent oral and written communication skills, and the ability to work effectively within a highly complex and challenging environment are important elements in this position. The salary range for this position is commensurate with qualifications and experience. Send letter of application and resume postmarked by **October 22, 1990** to: Facilities Management Search, Facilities Management Office, East Stroudsburg University, East Stroudsburg, PA 18301.

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Please include search number on all correspondence. Manatee Community College is dedicated to the concept of equal opportunity. The college will not discriminate on the basis of race, color, religion, sex, age, national origin, marital status, or handicap in its hiring and employment practices or in the admission and treatment of students.



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Perspective

Canada's Universities Address Their CRDM Problem

Physical plant administrators have been watching the problem of capital renewal/deferred maintenance evolve and magnify for many years. I am sure that each of you have many stories you could share about the frustrations of trying to get presidents, trustees, legislators, and others to appreciate the scope of the crisis and to act.

Clearly, part of the CRDM problem has been in attempting to define its actual dimensions. *The Decaying American Campus: A Ticking Time Bomb*, published by your association in 1989, helped to change all that.

This report provided the powerful evidence needed to focus attention on the growing \$70 billion backlog of capital renewal and deferred maintenance needs for facilities in U.S. colleges and universities. Even more significant, however, is what your association has done to promote awareness of this report. You have used it as a powerful tool to foster awareness on the part of decision makers and the public.

Evidence suggests that the message is finally beginning to get through. The results of a 1989 American Council on Education survey showed a remarkable one-year, 30 percent increase in the number of opinion leaders identifying facilities as a key challenge.

I am informed that APPA will be conducting a follow-up to its original 1988 survey later this year. These results will be important for two reasons. They will help identify whether the problem itself has grown, stabilized, or diminished. They will also provide fresh ammunition for your continuing fight to sensitize decision makers and to encourage them to take action.

APPA has played a critically important role in helping to define the scope of the problem in terms of aging facilities and deferred maintenance in U.S. universities and colleges. You have also been eloquent proponents of the position that facilities are key to the success of the academic mission and, thus, to achievement of broad national goals.

Here in Canada, we have taken a page from your book. We have recognized that the problem cannot be intelligently discussed, much less acted upon, until its di-

Dr. Claude Lajeunesse

mensions are more clearly established.

For this reason, the Ontario Association of Physical Plant Administrators undertook, in late 1989, a coordinated assessment of deferred maintenance in Ontario universities.

The results of this survey should not be a surprise to anyone. The total dollar volume of deferred maintenance was substantial in relation to total university operating budgets in the province—approximately \$273 million. The total amount actually spent on deferred maintenance in 1989-90 was in the area of \$8 million, or just under 3 percent of the amount required!

This survey is important not only for the data it produced. Of equal value is the direction outlined for future action.

The report, based on the survey findings, focuses its recommendations on the following areas: the definition and system-wide adoption of uniform maintenance standards; clearer identification of the operational consequences of continued deferral; and development of institutional support for an accelerated maintenance investment and capital renewal policy.

The common thread running through these recommendations is a recognition that the case must be more clearly presented if true progress is to be achieved.

The OAPPA has approved the recommendations of this report and is moving to develop plans for implementation. This is a vitally important initiative. It is one that I am sure all of us in Canada will be following closely over the coming months.

The seventeenth century French writer and philosopher, La Bruyere, wrote, "There are certain things in which mediocrity is

insupportable—poetry, music, painting, and public speaking." I think all of us would be quick to add one more item—university education.

We are faced, as never before, with demands seemingly far beyond the capacity of our institutions to cope. And yet, cope we must. Equality of access to mediocre institutions—to mediocre education—is, in the words of La Bruyere, "insupportable."

How then do we avoid becoming mediocre? I think at least part of the answer lies in attempting to understand the forces that are most likely to shape the future and, through this process of understanding, to develop appropriate strategies for action.

Canadian universities experienced significant increases in enrollment over the last decade. Healthy annual growth is expected to continue and levels can be expected to run in the order of 3 percent per year for full- and part-time students.

What is likely to be different about the

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Facilities Manager.

Claude Lajeunesse is president of the Association of Universities and Colleges of Canada, Ottawa. This article is taken from his closing keynote speech at APPA's 77th Annual Meeting, held last July in Ottawa.

student clientele of the 1990s will be the increasing numbers of mature students and those representing cultural and visible minorities.

The bad news is that we can expect to see professors retiring in ever increasing numbers in the next decade. The good news is that we should also begin to see a renewal of interest in postgraduate education—not simply to replace the aging professorate, but to meet growing demands on the part of government and business for increasing numbers of higher trained professionals.

Of necessity, and in response to growing demand, our universities will become increasingly flexible in accommodating the requirements of society, business, and government. As the information-driven econ-

omy evolves, so too will our institutions of higher learning.

While universities will need to be more attuned, and responsive, to the demands of their various clients, they will also need to become far more effective in dealing with funding pressures and financial realities.

Certainly, this will mean stronger efforts to encourage increased government funding for higher education. It will also mean coming to grips with those issues such as deferred maintenance, where delay in addressing the problem only means increased costs farther down the road.

As the OAPPA Report on Deferred Maintenance succinctly states: "Deferred maintenance is often seen as a 'pay now or pay later' issue. Within this context, there is much evidence to suggest that 'later' is 'now.'"

Hard questions must be asked about where available funding can be most usefully directed. At the same time, we must double our efforts to convince federal and provincial governments that in order to develop the nation's intellectual resources—to assist the government in maintaining Canada's economic health and competitiveness—increases in funding are desperately needed.

As your association has so correctly identified, we must also work to increase public understanding of the importance of education to our common future.

Above all, we must convince our political leaders of the urgent need for a national policy on higher education to help ensure our capacity to meet the challenges of a new decade and the beginning of a new century.

For its part, the Association of Universities and Colleges of Canada has embarked on a number of initiatives to help us in better understanding and preparing to meet the challenges that lie ahead.

We will be addressing the issue of competition for highly trained professionals in the sectors of academe, business and industry, and government. All three of these sectors are consumers of highly qualified human resources. Our objective is to determine whether shortages are likely to occur in business and government, as well as in academe.

On an even broader level, AUCC is in the process of establishing a national commission to study our university system. This initiative will focus on a number of key objectives:

- We want to elevate higher education on the public agenda. We want to increase public awareness of the serious problems facing our institutions, to encourage greater support for higher education and to con-

vince policy makers to provide the financial resources needed, including such critical areas as deferred maintenance.

- This commission will also be looking at the current state of teaching in our universities in Canada. We will be assessing what our universities are doing well, and what they are doing poorly. Where appropriate, we will be proposing internal adjustments to improve effectiveness.

The national commission will assist universities in a strategic planning exercise that will lead them into the next century. I am confident that this process will serve to further unite our universities. It will encourage them to define what they want and where they want to go.

This process will, in turn, aid the AUCC in developing a cohesive and informed statement, supported by facts and figures, outlining what we will require from government in our efforts to meet the expectations of society, business, and government through the 1990s and beyond.

It is our hope that the AUCC Commission will have a significant impact on the general public and decision makers in Canada. It may even be that our experience will provide insights that may be of value to you. Certainly, we will be eager to keep you abreast of our efforts and of the results achieved.

Despite having existed for centuries, universities are still in the process of defining their role in, and relationship to, society. To some, universities appear to be staff training centers for government and industry. For others, they are places to spend a few years en route to greater career and financial opportunities.

From the birth of the Renaissance to the remarkable changes sweeping Eastern Europe, universities have not only helped to preserve and advance knowledge in society, but have served as the leading edge of social development and growth.

Universities are an integral part of the culture in a society. It is not surprising that questions about the role of universities arise as our society evolves and cultural expectations change.

If there is a fundamental challenge facing the members of our community, it is to advance a new era of awareness and understanding of the value of universities and their contribution to the future of our respective nations and our planet.

We cannot be content in simply teaching our students. We must inform, enlighten, and influence the larger society of which universities are an essential part.

We could have no more noble a challenge, nor one more important to our common future. ■

Correction

Due to a printing error, the summer *Facilities Manager* had missing lines of type on page 22 and page 29.

On page 22 the paragraph should read as follows.

"How do the CFCs and halons harm the stratospheric ozone layer? When refrigerators or air conditioners are serviced or discarded, the coolant has been typically vented. Moreover, when used to blow foam or as an aerosol propellant, a fire extinguisher, or a metal-cleaning solvent, CFCs and halons are freely released into the air. These highly stable compounds remain intact until they reach the stratosphere. There, they are split apart by high energy radiation and release chlorine and/or bromine, which destroys the ozone molecules."

On page 29 the paragraph should read as follows.

"The EPA estimates there is friable asbestos material in about 733,000 buildings, or about 20 percent of all public and commercial buildings. EPA defines friable asbestos as materials that can be crumbled, crushed, or pulverized with hand pressure. Asbestos-containing insulation is in most cases covered by a non-asbestos jacket of cloth, tape, metal, paper, or cement. If the jacket is undamaged, EPA classifies this asbestos as non-friable."

by Christina Zack-Bordeaux

Focusing on APPA's Future: A Profile of William D. Middleton

APPA's new president, William D. Middleton, brings to his term more than forty years experience worldwide in the field of facilities management. With a proven track record of enthusiasm and dedication to the profession, he will devote his term as president to developing APPA's long-range goals.

Middleton presently holds the position of assistant vice president for physical plant for the University of Virginia (UVA) in Charlottesville. Considered by many to be one of the most beautiful university campuses in the country, it also bears the legacy of a distinguished history. The University of Virginia was designed and founded by Thomas Jefferson more than 170 years ago. The age of the institution, coupled with its distinctive architecture, provides unique challenges to the facilities manager.

APPA's New President

Middleton is a 1950 graduate from Rensselaer Polytechnic Institute in Troy, New York, where he earned a bachelor of science degree in civil engineering. He began his military affiliation in 1951 when he became a career officer in the Navy's Civil Engineer Corps.

Middleton's vast experiences in the field of facilities management have lead him to various parts of the world, in various capacities. During his thirty-year military career, his work has included many responsibilities similar to those in higher education: facilities planning and design; management and supervision of the maintenance and repair of buildings, roads, grounds, and facilities of all types; management of housing; supervising



PHOTO BY BETTY WOODING

On the steps of UVA's Madison Hall, Middleton (left) holds an impromptu meeting with Raymond M. Haas, vice president for administration.

the operation and maintenance of automotive and construction equipment; operation of all types of utilities plants and systems; solid waste collection and disposal; and the management of construction contracts.

One of Middleton's most challenging assignments was in South Korea from 1971-1973. He worked as chief of the plans and real estate division on the engineering staff of the United Nations Command, U.S. Forces. Not only did he plan for large volume construction under potential wartime conditions, but he worked closely with representatives of the South Korean government as the principal U.S. negotiator in real estate matters.

"At the end of the Korean War, the U.S. received real estate on which to establish military bases and other facilities," Middleton said. "In order to permit the Korean economy and the

major urban centers to grow, we negotiated deals where the Koreans would give us new real estate and finance the construction of replacement buildings, or actually construct them, in exchange for the land we were on," he said.

"For example, the U.S. Air Force had an airbase adjoining Kimpo Airport, the main airport in Seoul which is now a major international airport. The Koreans needed more land to expand the airport. We gave them the land they needed to expand and negotiated real estate and construction financing at another location," Middleton said.

Another assignment in which Middleton distinguished himself was at the Pacific Missile Test Center located in Point Magu, California, where he held the position of public works officer. In 1976, the Secretary of the Navy

Christina Zack-Bordeaux is a freelance writer based in Washington, D.C.

校园及设施规划管理讲习班

UNIVERSITY AND FACILITIES PLANNING AND
MANAGEMENT SEMINAR



Middleton (left) served on the faculty of a World Bank seminar at Guangdong Institute of Technology in the People's Republic of China in June 1990.

PHOTO BY BRUCE ARMSTRONG

singled out the center for its outstanding environmental protection accomplishments. "The principal environmental protection programs that were the basis for this award were developed and carried out by my department," he said.

Middleton's last naval assignment was at the Marine Corps Air Station in Iwakuni, Japan, where he held the position of facilities officer from 1976-1979. Again his work received recognition, this time from the Secretary of the Navy's Energy Conservation Award Program. "I managed a department with a work force of more than 400, operating on an annual budget of nearly \$14 million, and administered an annual volume of \$5 million in construction contracts," Middleton said.

Landing on the University of Virginia campus in 1979, Middleton found that facilities management on a university campus seemed a natural progression after years of work on various military bases.

At UVA, Middleton manages a department with a work force of more than 600 and a current annual budget in excess of \$41 million. He also manages an annual volume of more than \$20 million in construction contracts. "I've heard people facetiously refer to my operation here at UVA as the Little Navy Yard," Middleton laughed. "There was virtually a 100 percent transference of the skills and experience that you develop in doing facilities work in the naval environment and what happens on a college or university campus."

Along with his responsibilities at UVA, Middleton is also a consultant in

the field of higher education facilities management. He has developed or participated in studies for the University of Arizona, Pennsylvania State University, Hampton University, Virginia Commonwealth University, and the University of North Florida.

Middleton has also been successful in other arenas. He has combined a passion for writing and a deep interest in railway transportation by authoring more than fourteen books on the subject, and writing some 400 articles in the fields of engineering and transportation. "I've done several articles for *American Heritage* magazine that I'm quite proud of, all related to the field of rail transportation," he said. Today Middleton is a contributing editor to the journal *Railway Age*.

His interest in railway transportation stems from his childhood. Middleton's father was the local surgeon for the Rock Island Railroad in Davenport, Iowa, and his grandfather was the first chief surgeon for that railway. "I got interested in railroads originally through my family connection, an interest which has stayed with me," Middleton said.

Currently, Middleton is working on an article for the *Commuter Rail Planners Guide*, which is geared toward operators or planners of commuter rail systems. His article will focus on the commuter train operations of Northern Virginia and Maryland. "I have a dual interest covering both the history of rail transportation and the current operations of railway systems," he said.

APPA Excellence

Early on, Middleton found the

value of an APPA affiliation important. "When I first came to UVA, I found an organization that had enormous needs for current information on new technologies and methods," he said. "We also had a tremendous need for training and developing our work force." His initial reception at APPA's headquarters really piqued an interest in becoming active in the association.

"APPA is the kind of organization that has an extraordinary willingness among its members, as well as by the people who represent us at the APPA headquarters, to aid and assist each other." Because Middleton was coming into a university facilities operation that needed "major surgery," he looked to APPA to help him get the university back on track.

"We had a sizable deferred maintenance backlog, which was a major problem," Middleton explained. "We had to develop the organizational capability to accurately, and on a continuing basis, assess the condition of our facilities."

In an effort to organize his plan of attack, Middleton turned to APPA's twice-yearly Institute for Facilities Management, a week-long educational program. During his first year at UVA, Middleton solicited applications from his middle managers to attend the Institute. "I found a lot of people with good basic qualifications, but they had been isolated for a long time from current developments in the field. In those days, UVA wasn't up to the state of the art in facilities management."

Middleton said that the program has been of enormous help. "The training and development that our people get from the Institute has made a world of difference in how they perform," he said, noting that more than forty of his managers have attended. "It is a training program covering all the basic elements necessary for the practical application of facilities management."

"One of my longest and fondest personal involvements with APPA has been with the Institute," Middleton said. He teaches three courses in the second level, which include: contracting for services, organization and staffing for physical plant, and public relations and communications. "By teaching responsibilities, you tend to stay more abreast of current developments in the field," he said. "There's no better way to learn more about a subject than to teach it."

Middleton has been an important player within APPA's leadership. He served as president-elect last year; as vice president for educational programs for three years; has chaired the Institute Subcommittee for two years; and has been a faculty member of the Institute for six years. He also actively participated in the development of the second edition of *Facilities Management: A Manual for Plant Administration*, as a member of the editorial board, section leader, and chapter author.

Middleton's dedication to APPA has earned him two major awards from the association. In 1985, Middleton received APPA's highest individual honor, the Meritorious Service Award, for his work in managing the association's Institute for Facilities Management. In 1988, his work with educational programs earned him the distinguished President's Award.

International Involvement: China

Middleton's interest in facilities management is not confined to this country alone. Over the past five years he has traveled extensively through the People's Republic of China on higher education activities. In 1985, he was a member of a World Bank team that visited China to develop the 1986 report, *China—Management and Finance of Higher Education*.

"The Chinese people suffered enormously from the Cultural Revolution," said Middleton. "Every time I travel to China, I meet people who were victims. On the 1987 trip, I met a professor who was sent with her husband to the farms for a few years during the Cultural Revolution. You meet so many people in higher education who had that experience. It wasn't just a matter of bringing them back to the universities; it has been a tremendously difficult job to get the whole educational enterprise back in motion and up to date."

In 1987, Middleton was the program coordinator for an APPA delegation that included a cross-section of Institute faculty members who were particularly well qualified in a specific area of facilities management. Also invited were representatives from the National Association of College and University Business Officers, the Society for College and University Planning, and the Association of University Architects. "It was an invitation by the Chinese for us to visit a num-

Middleton (right) discusses strategies for obtaining state funding support with Stuart Connock, executive assistant to UVA's president for state governmental relations.



ber of universities and offer any advice or suggestions that we could," Middleton said.

After the trip, the delegates compiled a detailed report, which was submitted to the Chinese. "We recommended specific things, including activities where we could use APPA programs to help them develop their own professional capabilities."

Middleton's most recent trip to China was in June of this year. He was a member of a team that conducted a two-week seminar at Guangzhou University on facilities planning and management under the World Bank's Chinese Provincial Universities Development Project. Middleton said of the Chinese, "They'll take years to recover from the Revolution, and their needs are tremendous."

Despite the many problems facing these universities, Middleton noted there are some aspects that he admires. "The Chinese pay great attention to the care of the grounds and landscape. Some were just wonderful, and almost every campus had its little traditional Chinese garden, tucked away somewhere, that they had developed and to which much care was given."

Goals for the Future: APPA's Long-Range Plan

As APPA's new president, Middleton said he remains a champion of APPA's Long-Range Plan, passed by the Board of Directors at this year's annual meeting in Ottawa, Canada. Outlined in the plan are seven issues of concern to facilities managers today. These issues were the culmination of many planning sessions as well as the results of a member opinion survey distributed earlier this year. An analysis of the survey responses was prepared by Coopers & Lybrand.

"The membership really responded to the survey, and it allowed us to so-

licit their concerns about the future of our profession," Middleton said. During the fall of 1989, Middleton worked alongside then president Jack Hug to develop and distribute the survey. "Over the past year, I've been involved in assessing major issues and challenges facing the field of facilities managers over the next decade," he said.

The Long-Range Plan includes the following seven major issues: 1) integration of facilities management with institutional planning, policy, asset management, and finance; 2) adequacy of funding for facilities; 3) quality of the higher education physical environment; 4) human resource management; 5) regulatory issues affecting facilities management; 6) accountability for efficient use of human, capital, and financial resources; and 7) contracting for facilities management functions.

"Our central focus was to look down the road at what was happening over the next decade that would affect our field," he said. "The next step, after identifying those areas that are going to affect us as facilities managers, is to decide what we need to do to modify or change APPA so that it will be best positioned to support its members."

The Plan in Action

"What I hope to see during this upcoming year is the organization taking the results of the Long-Range Plan and taking a giant step toward doing the things for APPA, and its programs, that will move the association in the direction of being able to effectively meet the needs of the facilities manager in the profession for the next ten years," Middleton said.

Although each of the issues in the plan are equally important to Middleton, he did specify a few areas that

Continued on page 20

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THE UNIVERSITY OF VIRGINIA: PRESERVING HISTORIC DIGNITY

Thomas Jefferson designed his own tombstone to bear the inscription: "Here is buried Thomas Jefferson, author of the Declaration of Independence, of the Statute of Virginia for Religious Freedom, and Father of the University of Virginia." In his mind, founding the University of Virginia was more of a contribution to the new nation than serving as President of the United States.

This setting provides APPA's new president, William Middleton, with some of his greatest challenges, and some that he finds the most gratifying. "The history on campus gives an extra dimension to the job," he said. The school was chartered in 1819, and today houses 540 buildings totaling 9.5 million square feet on 1,050 acres. Middleton's annual budget exceeds \$41 million.

Preserving History

Remaining true to Jefferson's original design is always in the forefront of any decision, Middleton said. "The historic buildings on this campus are generally regarded as the finest pieces of university or college architecture in North America.

"They were designed by Jefferson, built under his supervision, and are not only on the National Register of Historic Places, but were named to the prestigious World Heritage List in 1988." Middleton reported that over the past ten years, the university has spent about \$6 million on the historic buildings alone.

In an effort to remain true to the Jeffersonian era, Middleton has a senior staff member with a doctorate in architectural history. "His position is architect for the historic buildings and grounds," Middleton said. "He oversees all the work that we do on the buildings, from the planning through the execution. He works in developing training for our craftsmen so they can do the very special kinds of things that are required to do proper historic preservation."

Jefferson's original goal was to develop an "academical village" in which teachers and students would create their own community. "Many of the original buildings are today used as they were originally intended, and they remain the center of the university," Middleton said. The focal point of the historic grounds is called the Rotunda and was modeled in the Classic style after the Roman Pantheon. It was the only building of the original plan still under construction at Jefferson's death.

Today almost all of the special needs required by Jefferson's original buildings are taken care of by members of Middleton's staff, a notion that makes him quite proud. In fact, many have become specialists in their work.

"Virginia was not a wealthy state when the university was built," Middleton explained. "To compensate for the lack of funds, modifications were made during construction. For example, Jefferson had all doors and frames throughout the buildings



Middleton (left) talks with painters Harold Breeden (center) and David Barbour (right).

PHOTO BY BETTY WOODING

made of plain pine. They were then grained to simulate quality imported woods like mahogany. This was done with paint, and it required an extremely high level of skill for the painters to do this," he said.

In an effort to recapture Jefferson's original work, a member of Middleton's staff learned how to imitate this procedure about four years ago. "One of our painters wanted to learn to do it. We got some training for him, and now he is a master craftsman at it. Our carpenters are also very skilled."

APPA has also tapped into this aspect of facilities management. It developed a Historic Preservation Skills seminar which was first offered in February 1988. "Our architect did some of the teaching, along with others from outside the university who had a specific preservation background," Middleton said.

There were also practical sessions in which "our painters and roofers were teaching the skills. It was very gratifying to see that, and to see how capable these people are. They are obviously very skilled at their work, very proud of their skills." Middleton said that the seminar drew more than 100 people.

Although Middleton was unable to pick his favorite of the Jefferson buildings, he did admit to being particularly fond of one special room located in historic Old Cabell Hall. "The building itself was constructed in the late 1890s by the well-known architect Stanford White. My favorite room is the auditorium—it is a horseshoe-shaped room with a wood stage in the middle, classic design, with a reproduction of the School of Athens as a backdrop to the stage," he said. "The room is the site for all the university's concert events like the symphony orchestra. I spend a lot of time there and really enjoy it."

State of the Art

For Middleton, preserving the campus' historic dignity while including current technologies is a real balancing act. Today a new hospital and related facilities project nears completion, one of the finest teaching hospitals in North America, according to Middleton. The 552-bed hospital opened last year, and is "state-of-the-art in every way. The building itself is technologically very sophisticated and the most complicated building that we have on campus," he said. The project's cost was about \$215 million.

"The maintenance needs of a hospital are more demanding than anywhere else. We have a requirement for skills and responsiveness of service that exceeds anything on campus," he said. Middleton noted a key method for successfully handling those needs was to create a separate department responsible for only the maintenance of the health sciences center. "That group focuses all their attention on the special medical requirements," he said.

Despite the strides the university has made, Middleton reported that Virginia's Governor is currently trying to deal with a revenue shortfall. The problem could hit the university from two directions. The first includes an overall budget reduction plan. "Like all state agencies, we have been asked to consider contingency plans for reducing operating budgets of 1, 3, or 5 percent," Middleton said. "We know that we have substantial reductions in our operating funds for the current year, and probably several years to come."

The second aspect of the shortfall may attack funds that were previously allocated to the university from the Virginia State Lottery. If this money is withdrawn, Middleton said that "some of our new projects will be unfunded or deferred. That includes the new building to house the English Department, which is our premier department."

Even with the budget uncertainties, Middleton remains unshaken. "The budgetary problems are a short-term problem. We may have a few bad years ahead, but when you are looking at things over the next fifteen years, it's a short-term problem. It isn't going to change our ability to successfully meet the challenge of growth."

Would Jefferson be proud of the way his University of Virginia looks today? "I believe he would," Middleton concluded. ■



PHOTO BY DANIEL GREGG, COURTESY OF UVA RELATIONS

Continued from page 17

top his agenda, noting that perhaps the most pressing issue today is the adequacy of funding for facilities.

"One of the most immediate problems facing all of us is the need to develop the resources to bring the physical condition of our campuses and facilities back up to a more adequate level. Not just fixing things, but what we call capital renewal, to change, modify, and upgrade," he said.

Middleton noted that his campus mirrors that problem, a campus full of wonderful old buildings that are technologically obsolete. "We need to recover from the backlog of capital renewal and deferred maintenance needs and stay well," he said.

Another issue that Middleton feels deserves immediate attention is the trend toward a more comprehensive approach to facilities management. "We need to have a chief officer who is looking at the whole picture, not just one piece of it. Someone who is in charge of not just maintaining and operating, but also managing the planning and construction of new facilities—managing the administration," he said. "That is a very specific goal of the Long-Range Plan. One way to do that is redefining or better expressing APPA's position."

He added, "We must make sure that the facilities manager is not left sitting

out there alone. Everything we do needs to be tightly tied to the institution's fundamental planning, policy, and finances."

Along with these concerns, Middleton said that the changing nature of the work force is another source of discontent. He explained that the experienced work force that staffs facilities departments today is shrinking. "Our traditional source is declining, and the workers replacing them are not as technically skilled as we require," Middleton said. "This tells me that we need to do a lot of training and developing to bring the education up to an adequate level—training this new work force in specific areas of the facilities trade."

The facilities manager is now challenged with a more diverse work force. For example, in the Southwest where there is such an influx of Spanish-speaking people, internal training programs require English as a second language as part of the program.

While APPA works to get these issues well in hand, other changes with respect to the Long-Range Plan are already underway. At the recent annual meeting, the APPA Board of Directors voted in favor of a dues increase—to be effective with the 1991 dues billing—to provide additional income to the APPA office to establish a legislative liaison department.

Middleton said that the develop-

Aerial view of the Rotunda and the pavilions along Jefferson's Academical Village.

ment of this department is a direct response to a cry from the membership. "We learned from the Member Opinion Survey that one issue that seemed to be the greatest concern to our members was the regulatory area—laws and regulations that have an impact on facilities managers. Just keeping up with that, knowing what is happening out there, is a real problem for our members," he said.

Middleton supports the move to fulfill the association's legislative needs. "We expect during the next fiscal year that we will have the resources to staff the headquarters with adequate legislative support for our members," he said.

Despite the challenges that face facilities managers today, Middleton remains confident and optimistic about the field—a field to which he is completely committed. He believes APPA plays a vital role in the profession's future; through programs, seminars, and good communication, the association can continue to help make the facilities manager today a success in the work place.

Middleton said, "I look around and see the quality of people who have risen to the top of the profession, and the quality of the people coming into the profession, and I think that they will take care of things just fine." ■

The Library Environment and the Preservation of Library Materials

by Carolyn L. Harris and Paul N. Banks

It's too hot! It's too cold! There's no air in here!" Familiar complaints? Yes, you hear them often from people, or maybe even from a computer that won't work if it's too hot or humid. Books, too, complain about the environment, but they do so quietly and over a long period of time.

The Library Environment

Library buildings are a rare blend of environments: storage space much like museum storage, and staff and user space that must provide people with a comfortable environment. In most libraries these two environments are meshed into one; books and users intermingle. Ideally they would not, allowing facilities managers to concentrate on the ideal environment for books in one zone, and for people in another. As this usually is not possible, the facilities manager ends up making a compromise between the two.

The vast majority of HVAC systems are designed and operated primarily or exclusively for human comfort, but the environmental requirements for the preservation of library collections are somewhat different than those for human comfort. Because people are more vocal and less sensitive than the materials, the environments tend to be designed to meet more minimal human standards. But library collections are being subjected to whatever conditions are maintained in the building twenty-four hours a day, 365 days a year, whether people are present or not. In fact, the environmental condi-



PHOTO BY THE OHIO STATE UNIVERSITY LIBRARIES

tions suitable for research libraries are closer to those of museums, laboratories, or medical facilities. It is crucial to the long-term preservation of library materials to provide them with the maximum standard environment possible.

The Library Collection

Even a small library usually holds hundreds of thousands of books, manuscripts, sound recordings, videotapes, compact discs, records, audio-

tapes, photographs, and works of art. Each item was chosen with deliberation to meet a specific need of the institution's curriculum or research. Most cannot be easily replaced, and even if replacement is possible, the cost of adding each item to the collection again is prohibitive. Therefore, it is necessary to preserve this major capital asset of the college or university. To replace an average small collection of 100,000 volumes, if it were possible, would cost close to \$7 million. A new book averages \$35 these days, and it costs about as much to accession and catalog each title for use. Most titles are no longer available because the publishers cannot keep them in print indefinitely; they would have to be replaced through photocopy or microfilm, a costly prospect.

The larger, more complex research libraries have an even more severe problem in that very little of the materials they hold are replaceable. Rare book and manuscript collections that hold unique and valuable materials are by definition irreplaceable except at great cost.

There are libraries that hold materials for only a short time, such as a reserve collection, where the needs of people take precedence over those of the materials. Discussion with librarians should make it clear which library environments do not need consideration.

The Problems of Deterioration

Preservation librarians think in terms of two forms of damage to library materials: chemical and physical. The chemical damage is a result of "inherent vice," the agents within the materials themselves that cause deterioration, and the environment that reacts with these agents. Chemical damage is impossible to reverse.

Physical damage is caused by use—

Carolyn Harris is director of conservation education programs, and Paul Banks is research scholar, in the School of Library Service at Columbia University, New York, New York. Thanks to Maxine K. Sitts of the Commission on Preservation and Access for assistance with this article.

the torn pages, the binding breaking away from the text, the spine detaching from the covers. This type of damage can most often be repaired for a reasonable cost.

Bad paper is the worst single preservation problem in larger and older research libraries. Surveys have shown that between 25 and 40 percent of the oldest, richest collections in the United States are embrittled.

A number of changes in papermaking technology came together about the middle of the nineteenth century, resulting in books that have become so brittle that they often cannot be used without pieces of pages breaking off in the hand of the reader. While good storage environment will not make a brittle book usable again, it will slow down the rate at which books move over the line from usable to unusable.

A dramatic example of the effects of environment on deterioration of books is two groups of identical nineteenth century Dutch pamphlets. One set is kept in the national library of the Netherlands, which has good environmental conditions (low pollution, lower temperatures, more constant relative humidity), and the other is in the New York Public Library. NYPL, located in the middle of New York City, did not have air conditioning until a few years ago. The Holland publications are in pristine condition, while the NYPL's had to be replaced with microfilm since they could not be handled.

A number of generalities can be made about environmental conditions for conservation of research library collections. The lower the temperature, the more constant the relative humidity within limits of 30 to 50 percent; the less light they are exposed to, and the cleaner the air, the longer the books will last.

Environmental Agents in Destruction of Library Materials

Temperature. The speed of chemical reactions is directly related to the temperature; therefore, the rate of the deterioration of materials is accelerated in a higher temperature. In fact, the Arrhenius equation shows that a ten degree Centigrade rise in temperature doubles the rate of deterioration.

Humidity. Paper and other book materials are hygroscopic and absorb or lose water from their surroundings. High humidity causes loss of strength and increased incidence of mold dam-

age; low humidity causes loss of strength due to embrittlement. Quick changes in humidity hasten the movement of deteriorative materials within the paper from sheet to sheet, and cause book structures that absorb humidity at different rates to break down.

Pollution. Chemical pollutants such as ozone, sulfur dioxide, and nitrogen oxides accelerate the degradation of the paper. Particulate pollutants, dust, and soot also bring acid into the books, but also act as abrasives, to cause physical damage. Conventional filtration only removes particulate pollutants.

Light. All light is damaging to library materials. Ultraviolet light, the highest energy wavelength, is most damaging, but the damage is due to both length of exposure and amount of light. Materials in direct sunlight from unshaded windows show fading quickly. Materials under ultraviolet light for only a small part of the time show damage only over a long period.

Research has demonstrated that a stable environment that maintains the temperature at approximately 65°F and the relative humidity approaching 40 percent will significantly extend paper's longevity. To preserve library collections, the HVAC system should maintain these standards, and also filter particulates and gaseous pollutants from the outside air. Research is under way currently to determine the exact temperature and relative humidity requirements for different types of materials. For a mixed collection these settings are considered ideal at this time.

In addition, libraries have attempted to cut down light through putting lights on timers where possible, adding shades or ultraviolet-filtering film to windows, and installing ultraviolet shields on fluorescent lightbulbs. Reducing light also provides for energy saving, and therefore lowered costs.

There is a committee working on formal environmental standards for the storage of books and manuscripts that will be issued by the American National Standards Institute. Such standards already exist for the storage of photographic materials.

Planning New and Renovated Buildings

Librarians and preservation administrators, library and museum environmental control experts, and consultants should be brought into the

planning process for new or renovated buildings. They can help determine major concerns, special problems (e.g., specific types of systems, filters), needs of the materials to be housed in the building, and compromises that may be made. Understanding the facilities requirements can lead to changes in planning, e.g., zones for book storage or locations of book stacks by librarians. In addition, libraries may have special requirements during construction projects in order to prevent damage from dust and dirt to the materials.

To complicate matters even further, many library collections, especially rare book collections, are housed in historic buildings. The collections need to be preserved, staff and researchers using the collections need to be comfortable, and the building needs to be preserved. In some cases this will mean creating an interior shell for the collections to keep from damaging the building itself.

There are also specific considerations in design of new buildings and HVAC systems that have a direct influence on the ability of librarians to preserve their collections. The following are a few points that may not be immediately obvious:

- The basic idea of preserving collections is to put as good a barrier as possible between the collections and the hostile environment. This implies that the ideal preservation building consists of a double shell between the collections and outdoors. Therefore, a building such as Columbia University's Butler Library, with air-conditioned windowless stacks in a central core with offices and reading rooms on the outside perimeter, even though built in 1934, is exactly right for the preservation of the collections.

- Removing gaseous pollutants requires expensive, special dry-bed adsorbers that are also expensive to maintain. The rate of loading of these adsorber beds, as well as particulate filters, can be reduced by careful location of fresh air intakes. One of the Columbia libraries has the intake directly over a busy bus stop, an obvious example of poor placement.

- Humidity control is one of the biggest problems in design. In cold climates, clean steam humidification is required in winter, and both chilling and reheat are required to dehumidify, especially in cool, damp weather. Often the control cycles and systems are compromised because energy con-

servation is the prime objective in the design, seriously limiting the preservation of the collections.

Maintenance of Environmental Systems

Obviously, good maintenance procedures benefit everyone. Even where systems were designed with conservation of collections in mind, one quite often finds that they are not being operated that way. They may be turned off at night, humidifiers may have long been disconnected, or lower-rated filters are being used.

The following are maintenance procedures that particularly impinge on the preservation of the collections.

- **Relamping.** Low-UV fluorescent tubes or plastic UV-absorbing sleeves are installed in rare book and exhibition areas to reduce damage from UV radiation. Workers doing relamping, especially contractors, seldom know the purpose of these precautions and relamp with regular tubes and discard the sleeves.

- **Air filter maintenance.** Because of the damaging effect of dust on library collections, air filters should be replaced with ones as efficient as the filters they are replacing. In fact, replacing them with higher efficiency filters will benefit collections if the air-handling system can accommodate them.

- **Calibration of sensors.** No system can maintain closer control than the accuracy of its sensors, and humidity sensors are notoriously unreliable. Frequent recalibration is essential.

- **Humidification equipment.** This equipment requires high maintenance, and about half the time it is found to have been disconnected at some point. Recent research has shown that cycling RH between 40 and 60 percent significantly accelerates the aging of paper. Effective maintenance of the humidification system is a high priority for preservation.

Another issue, inevitably, is cost. Some features further both collections conservation and energy conservation; for example, fine control to reduce energy waste, maximum thermal barriers, and reduced lighting. But others, especially twenty-four-hour operations, are energy- and fund-burners. Air-side economizer cycles, which are sometimes found in HVAC systems built since the 1970s, do exactly what is counter to preservation: they bring in unconditioned outside air. In addition, energy-saving measures such as raising the chilled water temperature

reduces dehumidification, which leads to accelerated chemical deterioration of paper, wider seasonal extremes, and increased possibility of potentially devastating insect infestations.

Housekeeping and Control of Biological Agents

Cleaning of general library stacks is usually done when the library is closed, and increasingly by outside contractors. Inadequate cleaning of floors can encourage insects. Careless mopping, stripping, and waxing with consequent splashing onto books, as well as smoking or eating in the book stacks, present real hazards to the collections. At some libraries it seems that whenever the cleaning staff waxes the floors in stack areas, the bottom two shelves of books get waxed as well. This is disfiguring—in some cases obscuring information—and difficult, expensive, and time-consuming to remove.

The materials used to clean the buildings and books are important. Cleaning cloths impregnated with mineral oil are often used; mineral oil is not toxic to books, but it leaves a residue that will attract more dust. Therefore, the use of cloths that attract dust through static electricity is recommended. Also, vacuuming, while useful, must be done carefully. A book is a delicate balance of physical forces, and any use can damage the binding or the paper. Vacuuming indiscriminately can lead to loss of information; the paper from brittle books is easily sucked up into the vacuum. Of course, this type of paper, often in cornflake form, requires the cleaning of floors on an intensive regular schedule.

Insects

Facilities managers are the experts in dealing with silverfish and cockroaches, while librarians see the evidence of their damage. Silverfish and cockroaches love the glues and sizing in cloth bindings. Libraries have made many attempts to keep library users from having pizza delivered directly to the reading room and to see that the sodas, burgers, bagels, and coffee are consumed outside and away from the materials. However, we have been almost completely unsuccessful. So the answer becomes better prevention; for example: emptying the library trash cans continually and exterminating when necessary in an integrated pest control program.

Mold

Mold and mildew is another problem for books and paper, as well as other media. If the humidity and the temperature are too high, the mold and mildew will attack and weaken the components of the materials. To clean mold and mildew requires a time-consuming, book-by-book wiping operation, along with a thorough disinfection of the entire area.

Disaster Protection

A librarian's most stressful time is when the pipes are leaking, there is fire or smoke, or the roof leaks. In most library buildings, this seems to be a continuous problem. Wet paper is extremely fragile. If the paper is coated (like most art books, and medical and scientific journals), when it dries the book could be used as a building brick. Damp and wet paper can be air dried naturally or freeze dried, but it has to be done immediately. And although it may be dry, the paper is cockled; the books are never the same. Librarians depend upon the facilities people both to prevent this type of damage and to assist in the cleanup.

In a fire, the less water the better, but you can recover books from water; in fire, they're completely gone.

Fire Suppression Systems

There is much controversy among library preservation professionals over which are the most effective fire suppression systems. No one wants to lose a collection to fire, but water damage is often the immediate cause of damage. Which is best: dry pipe sprinkler systems (which have a tendency to fail occasionally), a wet pipe system that results in water running over the books, Halon, or something quite different? Halon used to be the suppression of choice for special and rare materials, but the force in which it comes out and the residue left on the materials have posed problems. In any case, this method may shortly be banned because of CFCs.

Disaster Planning

Disaster planning for a library is the library's responsibility, but it cannot be done in a vacuum. The facilities and security people should be involved, both to provide training, instructions on whom to call when and for what need, and for mutual understanding of needs and problems. It is entirely possible that librarians do not

realize that plans do exist. Facilities managers are in a position to remind librarians of the dangers and possible resulting damage of disasters and to be helpful in initiating this type of planning.

An open question: Why is it that the testing of the sprinklers often is done without warning, sometimes creating an unnecessary disaster? Librarians can understand that there is a need to test the sprinklers, or to blow soot out of the air conditioning ducts, or to leave the heat on after the weather has been warm outside, but some warning time would enable the books to be protected first.

Library Preservation

Preservation includes more than improvement of the environment. The environment is the most important factor in the preservation of library materials, and seems always to be the most difficult because it is expensive and administratively complex. The field of library preservation is relatively new; only a few libraries have preservation professionals. Those that do, and many of those that do not, include these preservation activities among their continuing functions:

- Control of the environment to prevent deterioration.
- Physical treatment: repair and re-binding of library materials.
- Reformatting: replacing brittle materials by photocopying or micro-filming the original.
- Conserving materials with artifactual value in special collections.
- Writing policies and procedures that prevent damage.
- Training and educating staff and users to preservation and their role in protecting library materials.

In addition, through national cooperative efforts, an initiative to im-

prove the quality of paper through the use of alkaline paper-making processes has begun in Congress and with book publishers, agents, and authors. This should help to prevent the brittle book problems of the future.

Other preservation strategies currently under development include mass treatments to neutralize the acid in paper and to strengthen paper. New reformatting technologies, including machine-readable text files, are also on the horizon.

Communication Between Facilities Managers and Librarians

Library preservation is a relatively new concern. It is important for the physical plant administrator to understand that most librarians are not yet involved in preservation and know little about how to accomplish the improvement of the environment. The facilities manager cannot take for granted that the librarian will understand the problems inherent in providing the ideal environment. We need to take the time to talk to each other—to plan and to learn step by step.

On the other hand, some librarians may feel more secure using a consultant with a track record in library buildings and renovations to foster the communication. This is even more true when outside contractors perform the actual work.

Conclusion

Library materials are a product of an intellect putting ideas together for transmittal to others and a physical artifact produced from various organic materials that inevitably decay. It is the responsibility of academic institutions to ensure that these materials housed in libraries remain available to scholars and students. The most cru-

cial aspect of preserving these materials is the environment in which they are housed. To perform this function requires the cooperation of the physical plant managers and the librarians.

There are many types of buildings on a campus that require special environments—the library is just one. It has been suggested that we think of books as laboratory animals. They have their own needs and life cycle; but they do not bark or squeal. Yet books can continue to die horrible deaths from heat, high or low relative humidity, pollutants, poor or damaging housekeeping, insects, fire, and flood. It is our common goal to keep them alive for as long as possible.

For further information on the effect of the environment on library materials:

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APPA Plans Seminar on Preservation of Library and Archival Materials

February 28 - March 1, 1991
Washington, D.C.

This exciting new educational program will explore the specialized facilities needs of libraries and archival materials storage. This seminar seeks to improve communication and understanding between facility users and facility managers by increasing awareness of needs and priorities.

The program is organized in two parts: problem identification and evaluation, and maintaining the best environment. Faculty members will include higher education administrators, library directors, facilities managers, and other specialists. The cost is \$295 for individuals from APPA member institutions; \$345 for all others. To register or to receive additional information, contact the APPA office at 1446 Duke Street, Alexandria, VA 22314-3492; 703/684-1446.

Preservation of Library and Archival Materials is sponsored by APPA in cooperation with the Commission on Preservation and Access.

Choosing the Form of Construction Contract

by Edwin A. Dews

Choosing the form of construction contract is probably one of the most difficult areas of the building acquisition process to discuss in general terms. A particular institution may be restricted by policy decisions over which it has no control. The form of contract may have to take account of special considerations relating to cash flow, or to local experience and politics. The unfamiliar can be more expensive, regardless of whether in fact it should be, and in any given region there is likely to be a form of contract that is familiar to all branches of the construction industry. There are clearly some special exceptions to this general statement.

It is also difficult for governing bodies to assess the risks involved when the use of unfamiliar forms of contract is proposed. The cost of a major failure could be devastating. However, it is important to recognize that all forms of contract entail risks of one kind or another for an owner. What should be attempted, when a choice is made, is a realistic appraisal of the relative merits or risks associated with each, and a clear understanding of the relative responsibilities of each party involved, either directly or indirectly, with each system under consideration.

It should also be noted that many building contracts set out requirements that may commonly be accepted without challenge, but may in law be difficult to support. Most builders and consultants know this, but in many cases the owner may not be aware of the weaknesses of the contract to which he or she is a party.

It is probably fair to state that the reasons why many contracts do not result in litigation are twofold. First, the high cost of litigation encourages all parties to accept compromise solutions, although this can work unfairly if either party is unreasonable. It is usually the contractor who must sue



to obtain redress if the anomaly relates to cost, and the owner if it relates to quality or time. Second, many firms do not wish to risk gaining a reputation of being prone to initiating litigation, as it might damage their market image for potential clients and, in the case of contractors, prejudice their chances of being able to obtain competitive subcontract support.

This may be interpreted as rather severe criticism of the forms of contract used. Before reaching a conclusion it is necessary to remember that contracts are written by a great number of people, to comply with a wide range of circumstances, and deal with the complicated processes involved in the construction of projects. There is no unique solution appropriate to all cases, and the process is so complex that it is unrealistic to expect that a risk free document can be prepared in every case.

This article is not intended to analyze the strengths and weaknesses of various forms of contract. The purpose is to define the major issues that should be considered before a specific form of contract is adopted, and to promote the thought that facilities managers and other administrators should make a deliberate choice of

contractual form. This is preferable to accepting without question the documents for which they will, in the end, have to take responsibility, and which will establish the terms on which their new project will be purchased.

For each class of work there will usually be standard forms of contract that will have been developed through consultation between major client and constructing groups. Such documents frequently form the basis of contracts, but they are usually modified by special conditions that are established for each contract or groups of contracts according to the requirements of major clients.

Although it is not stated in the documents, such contracts are usually designed on the basis of various assumptions about market conditions and other factors that affect the industry. Where there is a major change in one of these unwritten factors, that particular form of contract may become inappropriate. But because of familiarity considerations and the difficulties and expense involved in establishing new procedures, they continue in use, usually to the disadvantage of the client.

However the documents are written, it is the contractor who sets the price and, once the documents are

Ted Dews is controller (buildings and grounds) at James Cook University of North Queensland, Townsville, Australia. He wrote "Choosing the Team for Major Physical Development Projects" in the Winter 1988 Facilities Manager.

signed, it is the contractor who holds the balance of power in the project. After signature, the client in many cases is a passive partner. The consultant employed, on an intermittent basis, checks progress and approves quality of work against the documented requirements, and recommends payments that the client *must* render upon receipt of the consultant's certificate. It is small wonder that at this stage of a project many clients become frustrated and disillusioned; extra costs begin to accumulate, delays occur, and the project may not even be in reality what the clients expected to see when they approved the plans.

A large measure of the fault in such cases may well be with the client, who frequently fails to understand properly the full implications of the document that he or she signs. When planning began for the project it is likely that no thought was given to the kind of contract that would be used. It is also quite common for contractual documents to be presented to the client as a *fait accompli*; the client is initially obliged to assume that the consultant has made the correct decision, and pressures of time prevent the client from giving serious consideration to any significant change.

The consultant will always be happiest with the form of contract that he or she knows best, whether or not it is the most suitable. Regrettably, there is little incentive to adopt the client's point of view, other than that promoted by concern about future work. If, as is often the case, consultants are overextended, then this is not a serious consideration in the case of any one client. In times of work shortage other elements of consultant attitude may change, but there is usually great reluctance to embark on novel contractual processes.

Development of new forms of contract requires a great amount of work and expense and involves negotiation with contractors or other representatives of the construction industry. It may also be hindered by the fact that there are invariably one or two basic forms that have already been established in a given region. Commonly, there is one form of contract that will have been developed by constructors and the government agencies involved in major projects, but the private sector usually has a different form of agreement developed by the constructors and their consultants. It must be abundantly clear that the interests of consultants cannot in all cases be identical with the interests of clients, no matter how hard they try to achieve objectivity.

In addition to the usual basic form of lump sum contract, based on full working drawings, there are other choices put to the client. Often these involve higher risk, e.g., the "cost plus" contract, based on established unit rates or simply on a "charge-up" basis for labor and materials. Only in rare cases of high risk, modification work—or work that cannot be assessed in detail before it starts—should these be considered. This discussion is designed to apply generally to the usual major building project that starts with all major factors readily identifiable.

COST, QUALITY, AND TIME

What are the features of most concern to the client? Given that he or she can be satisfied that the plans provide the facilities and standards of construction appropriate for the project, there are three major factors of concern. They are discussed so often that every person in the industry is well aware of them, but only rarely does the client attempt an analysis of what

is involved in getting the best results. Only large constructing authorities are likely to attempt it. The institutional client, for whom construction is a secondary function, usually goes little further than being painfully aware of the problems.

The three requirements are: control of cost, quality, and time performance. They are, of course, interrelated, but they should be examined from the client's point of view, with responsibilities and risks identified.

Cost

Cost control in relation to the form of contract can conveniently be considered in two stages:

1. Before the contract is awarded—pre-contract.
2. During construction.

It is assumed for the moment that the effect of design on cost is outside the scope of the discussion. Further reference will be made to forms of contract that can, under suitable circumstances, provide strong support to total cost control procedures.

There are a number of factors, quite apart from design features, that influence the prices received when a design is prepared and plans and specifications are put out to tender. The most important of these are:

1. *The market condition.* This is usually beyond influence by any particular client, unless in an area of limited resources one organization is capable of overtaxing the local labor force.
2. *The degree of risk on uncertainty inherent in the contract.* The greater the risk, the greater the sum that a contractor must allow to cope with contingencies. It may relate to inadequate definition of the scope of work, of the standard of finish expected, uncertainty about site conditions, or about the availability of materials or labor.

The length of time allowed to price the work must be reasonable; otherwise the bidder will cover these uncertainties by adding to the bid.

The length of time nominated for construction will also have a significant effect on price. Will overtime be needed? Will there be time to find the cheapest source of materials and transport them to the site by the cheapest method? The client may well be quite prepared to pay more for early delivery, but it should be a deliberate decision. On the other hand, an unduly protracted construction period



may involve substantial extra cost in overhead if imposed by the client for any reason, such as cash flow constraints.

Finally, the reputation of the organization administering the contract can well have an effect on price. There are, inevitably, in construction specifications many non-specific statements of requirements. The interpretation of these on the job by the controlling authority is of considerable importance and will influence cost to the builder.

Once the price is committed the major areas where costs need control are those arising from variations, contingencies (whatever their source), and increases in cost of labor and materials if it is not a fixed price contract.

The contract documents should provide clearly defined means of dealing with all three requirements in a routine and systematic way to cover all cost implications. The client should be aware that variations may generate consequential overhead costs and cause time extensions.

It is frequently advantageous to the client, in times of rapidly increasing materials costs, to have contract provision for early purchase and payment for materials to be used. Calculations of cost increases due to rises in wages and material usually are based on the unexpended balance of a contract at nominated times. Therefore, it is possible to save substantial amounts of money in this way (or for a contractor to make a hidden profit). Such a contractual provision must allow for safe storage, identification, and insurance of such purchases.

The form of contract will have a strong influence on the effectiveness of cost control (and also the form of contract between the consultant and the owner). In this section the preparation of design documents and technical specifications must be discussed, as there are many almost arbitrary decisions made in the matter of design detail that can generate or eliminate major cost items.

The most effective way to overcome many of these costly items can be to bring the contractor into the design process. This in turn demands a form of contract that extends into the planning stages, involves close collaboration between designers and builders, and offers the client a means of withdrawal without penalty should he or she not wish to proceed beyond documentation. This process should also provide reasonable compensation for

work done by the planning team, including the contractor. In most cases it also involves the development of an openly competitive means of early contractor selection.

The risks against which the client must be protected are incompatibility of contractors and designers, and an undesirably firm commitment to a contractor at too early a stage. Against this risk must be weighed the risks involved in a commitment to a designer who is not cost conscious to the degree that the client requires. Such a designer will have difficulty in keeping abreast of many of the detailed items that add, perhaps unnecessarily, to the cost and schedule of construction.

A prime requirement of a client, when a firm contractual agreement covers both design and construction periods, is the ability of that client to make design decisions within a previously agreed period of time. Failure to do so will invariably involve a cost penalty, either directly or indirectly.

The standard of documentation also affects the cost quite dramatically. If the technical information provided does not supply adequate detail—and relies extensively on blanket statements such as "in accordance with best trade practice to the satisfaction of the architect"—naturally the contractors must add to their prices to cover the risk inherent in the unknown demands. This cost is hard to identify for any given job unless detailed access is available to builders pricing details. Such access is rare, so the client frequently remains ignorant of this cost component. The percentage system of payment to consultants ensures that the greater the risk that must be covered in contractors pricing, the greater the fee paid to the designer. Up to the point where the client can no longer afford to proceed, there is little incentive for cost reduction by designers.

Since contracts quite necessarily specify a time for completion, costing must be based on the resources needed to complete them within the nominated time. If the period is unrealistically short, there will be associated cost penalties to cater for overtime needed. If the period is extended there may be overhead charges that must be passed on to the client. Under current construction industry conditions there are invariably some valid reasons for extensions of time due to weather, strikes, shortage of materials,



and so on. When currency values are diminishing steadily there is frequently, and reasonably, a mechanism provided to meet costs beyond those applying at the time of tendering. Although the risk on these may be accepted by a contractor (at a price), extensions of time beyond the stated period will, in most cases, generate an added cost that a client must be prepared to meet.

Provisional sum allowances within contracts also add to the uncertainty of a client, unless firm prices are obtained at the same time the main contract quotations are obtained. Quite frequently this is not done. In the event of price difficulties with the main contract, these remaining provisional sums may be pared unrealistically by consultants to make it appear that budgets can be contained. The hard truth comes home to the client after he or she is committed.

Variations after a contract is awarded must also be kept to the minimum unless cost penalties are to be incurred. After the contract is awarded, the contractor is not forced to price competitively. A variation may well present a justifiable reason for an extension of construction time, again adding expense.

The mechanisms for handling variations must be clearly specified in the documents. A prudent client will insist that the contract with the consultant must clearly define the limits within which the consultant must work. The client must also exercise firm control over his or her user departments to ensure that any client-initiated varia-

tions are fully justifiable. Although in strict terms the consultant/client agreement is outside of the scope of this section, it is relevant to note that variations fall into the following classes:

- local authority requirement;
- client-initiated;
- builder's request;
- consultant-initiated; and
- emergency safety requirement.

Generally, the consultant should be given freedom to act without client consultation only in the last case. Mistakes should not be remedied at the client's expense by use of contingency sums.

Quality

Many institutional clients, at early stages of construction projects, have difficulty in setting standards of construction quality that both minimize maintenance costs and contain capital budgets. But, given that standards have been set, the contractual procedures and documentation must ensure that these standards are achieved.

In most conventional building contracts, the consultant specified in the documents is usually the only person who may make the decision as to whether the construction is acceptable. It may be necessary to protect a contractor from an unscrupulous client, and it may be necessary to protect a client from an unscrupulous builder; however, as long as sensible provision is made for arbitration in the event of unresolvable disputes, an institutional owner may be better served by taking a direct part in the supervision process.

There are two ways in which this may be achieved, either directly within the contract procedure, or indirectly by retaining free access to the job for inspection by institutional staff. A client may elect (before a contract is awarded) to take complete control of supervision. Whether this is a safe procedure depends largely on 1) the degree and accuracy of detail in the documentation, 2) if the project is to be completed in stages, and 3) if the institution can support sufficiently experienced staff. Once again, it is important that the institutional administrators realize that there is a choice to be made, and that it is theirs to make.

Time

Clients must understand that once a contract is signed or a consultant is commissioned, the time performance

on the job will be enforceable only in terms of the documents. Whatever is written, barring extreme cases when default clauses are implemented, the only redress available is to seek cash compensation for late delivery, given that damages can be assessed and collected. This is frequently of little value to the institutional owner who requires the building for a specific purpose at a specific time.

It is therefore essential that a realistic time be set for completion. If it is not realistic, a contractor will either refuse to undertake the job, or build into the price a sum that will cover damage payments for the period that the contractor believes will be necessary over the time stipulated. It is also likely in the latter case that every possible effort will be made during the contract to win extensions to turn this sum into profit. Since the contract usually excludes certain risks—unexpected weather conditions, on-site strikes, strikes affecting delivery of materials, and the application of extensions—the odds are strongly in favor of the owner paying in the end.

Whatever form of contract is adopted, there should be clearly stated requirements for the most advanced degree of job programming that can be expected, with provision for regular review as the job proceeds. Care must be taken to ensure that acceptance of a project at any particular stage does not become the final contractual determinant of completion time. The job program must be required as an aid that must be divulged to the architect and client, and it must be reviewed if performance does not match the project for any reason.

Provision should be made for regular discussions between builder, consultants, and clients to report on progress and provide the easiest means of resolution of difficulties that may affect the progress of the work. This enables decisions involving all parties to be made without delay. Such meetings should not be involved with detailed site management, and should not be held on the site.

If completion time is important to the client, the inclusion of a bonus system (within defined limits) for early completion may be used as a genuine incentive. But it must not encourage substandard workmanship and cause consequential disputes.

CONCLUSION

When assessing different forms of

contract, the essential feature is to identify and compare the advantages and disadvantages to any given owner.

All forms of contract procedures involve an element of risk to a building owner. It is important to the owner to make an assessment of these risks from his or her point of view and to have an understanding of the factors that will influence the advocates of any particular method.

These factors may be political, as the building industry as a whole has substantial political influence in any developing region. They may relate to the fear of erosion of the status of professional groups, or they may simply result from fear of the untried, which is difficult to attempt in a changing economic climate of rapid increases in prices of labor and materials, and a changing balance between these two components.

When solutions that were economic become uneconomic because of this changing balance, contractual procedures, from commissioning of design to completion of construction, need to be modified to harness all of the resources available and provide a common incentive to find the most effective and efficient solution for the owner.

The solutions that were appropriate when buildings were virtually standard components with a stable cost structure are rarely the best when these factors change.

The institutional owner should explore the various opportunities that exist:

- Modifications to conventional contracts.
- Degree of participation of its own staff.
- Constraints that should be placed on consultants.
- Procedures that will encourage user, designer, constructor, and owner to act as a team with a common primary goal.
- Means of identifying risk factors and deliberate decision making as to who should accept them and what the price is likely to be.
- Forms of contract that will meet changing circumstances.

When the institutional owner simply takes what is superficially the easiest path and proceeds always on the basis of what has been done before, they have, by default, accepted the biggest risk regarding the satisfactory execution of its building project. ■

by April Moore

The Best In Service: Innovations from Award Winning Facilities

Creativity, commitment, and hard work help build effective and well run physical plants at many colleges and universities. APPA recognizes these qualities and outstanding achievement in physical plant departments through its annual Award for Excellence in Facilities Management. In addition to encouraging and saluting successful approaches to the myriad aspects of the smooth functioning of a campus physical plant, the award also engenders appreciation for physical plant staffs and their invaluable contributions to their institutions.

This year's winners of the award, honored at APPA's 77th Annual Meeting in Ottawa last July, are Texas Tech University, Lubbock, and the United States Military Academy, West Point, New York. Texas Tech won the award for the large school category (more than 5,000 students) and West Point won in the small school category (fewer than 5,000 students).

Texas Tech, of the Central Region, and West Point, of the Eastern Region, were chosen from among five regional winners in each of the two categories. The other large campus regional winners included Rutgers University, New

Brunswick, New Jersey (Eastern), Virginia Polytechnic Institute and State University, Blacksburg (Southeastern), University of Utah, Salt Lake City (Rocky Mountain), and University of California at Riverside (Pacific Coast).

The other regional winners in the small campus category include Southern College of Technology, Marietta, Georgia (Southeastern), University of Tulsa (Central), New Mexico Military Institute, Roswell (Rocky Mountain), and University of Puget Sound, Tacoma, Washington (Pacific Coast).

APPA's Professional Affairs Committee chose the two international award winners based on such criteria as organization and effective use of resources, efficient procedures for handling maintenance, personnel development, fiscal planning, campus condition and appearance, and planning for future physical plant needs. The imaginative approaches to facilities management employed by the two international winners, as well as by the regional winners, may serve as inspiration for other physical plant administrators. "Physical plant administrators are always looking for more effective ways to manage the many diverse aspects of running any campus physical plant, large or small," said Professional Affairs Committee Chair Charles Jenkins.



April Moore is a freelance writer and editor based in Silver Spring, Maryland.



Texas Tech University.

THE INTERNATIONAL WINNERS

Texas Tech University

This large Texas panhandle university educates both undergraduate and graduate students and is one of the few universities in the nation to operate both a School of Medicine and a School of Law on its main campus. With more than 1,800 acres, Texas Tech is also one of the largest campuses in the country.

Technical Innovations

A series of technical innovations that have streamlined operations and saved money distinguish Texas Tech's physical plant operation. A system that allows for the timely detection and repair of campus natural gas distribution system leaks has been in place for five years. A two-person team surveys all gas lines on the campus semiannually. This frequent and thorough process means that leaks can be detected while still small and relatively inexpensive to repair, before they have grown large enough to cause danger. Since the survey plan was begun, it has saved the university more than \$86,000.

Texas Tech is saving 1,000 work-hours annually and \$1,500 in avoided material losses through its conversion from rock salt to saturated liquid brine in water softener regeneration. The

use of rock salt posed storage and safety problems for employees who had to handle 50-pound bags in cramped locations.

Another Texas Tech innovation is a procedure that reduces tire failures on rental vehicles in use for long distance driving. A rental fleet of twenty to twenty-five vehicles (mostly vans) is operated by the building maintenance section and used by various university departments. The incidence of tire failure increased significantly when tire treads showed 50 percent or more wear. The building maintenance staff began replacing the rental fleet tires when wear reached 50 percent. The removed tires were then installed on the campus fleet, which is largely confined to the campus and Lubbock area. Through this procedure, rental fleet tire failure has been reduced by 90 percent and replacement tire cost for the campus fleet has become negligible.

Indeed, Texas Tech deserves credit for its conscientious care of its vehicles. Thanks to a rigorous preventive maintenance schedule, many vehicles in service today are more than twenty years old; the odometers have turned at least once.

Other Texas Tech innovations include the following.

- The physical plant staff found a way to save time and materials in the

repair of expansion joints and valves in steam and chilled water distribution systems. With reusable insulation jackets, the requirement for re-insulation by a special insulation crew is eliminated. The jackets are simply removed, inspection or repair is accomplished, and the jackets are replaced by the same mechanics.

- The university now saves \$9,800 per year because the physical plant staff modified a lube oil purifier to serve both lube oil and fuel cleaning functions. This eliminated the need for periodic fuel cleaning by a commercial contractor.

Many of Texas Tech's applications have been recognized with cash awards from the National Association of College and University Business Officers. "In fact," said Hiram "Gene" West, director of building maintenance and utilities, "we put the award money into a scholarship fund for students employed by physical plant. The scholarships serve as an incentive, and they help us attract good students to the department."

A Commitment to Service

"While we are always looking for ways to cut costs and use limited resources more effectively," said West, "our number one commitment is to the campus community we serve." Periodic visits are made to academic department chairs to ask, "How goes it?" During these visits, the functions and goals of physical plant are reviewed with academic department heads. "We want all areas of the university to understand what we are trying to do and that budget constraints compel us to prioritize. We also want feedback from the campus community about how well we are doing."

To stimulate feedback, a survey is sent periodically to academic department heads requesting an evaluation of services. Depending upon the feedback received, physical plant goals and timetables may be adjusted to meet the needs indicated by department heads. "Generally, the campus community is pleased with our work," said West.

To respond as quickly as possible with as little disruption as possible, custodial services schedules routine repairs on a nightly basis. Work is completed within twenty-four hours of a request 90 percent of the time. Major project work is scheduled during the summer whenever possible, when the student load is at its lowest.

U.S. Military Academy

The award winner in the small school category is a unique institution. As a university, the U.S. Military Academy (West Point) is responsible for the undergraduate education of 4,400 college students. Yet West Point is also a military installation, with the mission to train U.S. Army officers. And unlike most colleges and universities, West Point is also a tourist attraction. It accommodates nearly three million visitors each year.

West Point's directorate of engineering and housing (DEH) maintains support facilities for 5,000 families, soldiers, and other military personnel. These facilities include housing, hospitals, elementary schools, clubs, commissary facilities, recreational sites, and 13,000 acres of military training ranges. DEH has instituted innovative programs in the areas of fiscal management, training, and environmental protection.

Fiscal Management

All divisions within DEH participate in the development of the annual budget. Through a program called "Manage the Civilian Work Force to Budget," each division chief prepares a budget request for that division. The four division budget requests are then factored into the total available funds to produce each division's actual budget. In addition to helping establish the budget, the four division chiefs also assume responsibility for functioning within their budget. "Allowing division heads to help develop their own budgets and holding them accountable for expenditures causes them to closely scrutinize spending and to manage their dollars efficiently and productively," said Col. Richard Ely, head of DEH.

Every month the division chiefs measure their expenditures against their targets, and where discrepancies are noted, adjustments can be made to correct them. If new or unplanned situations within a division require more funds, division chiefs are required to submit a request for additional resources.

Training Opportunities and Recognition

West Point has initiated innovative training programs that expand the availability of skilled labor to DEH. This is important to an institution located near New York City where wages are high and competition for



United States Military Academy.

skilled workers is great. "DEH is committed to creating a work environment in which employees can grow and expand their abilities," said Ely. "It's good for our department, and it benefits individual employees."

Master craftsmen are often invited to West Point to demonstrate their expertise for staff members working in the same craft. And DEH makes it possible for staff members with an interest in a new technology or new piece of equipment to learn about it. A cross-training program allows any DEH employee to obtain training in an area outside the one in which he or she works. The trainee spends a portion of the work day apprenticing with a staff member who is skilled in the trainee's area of interest. DEH also conducts frequent exchanges with other military installations so that West Point supervisors can see how other physical plant departments accomplish their work.

The intern program is an opportunity for unskilled workers. Entry level staff members are trained on the job, allowing them to advance rapidly to a higher paying position with greater responsibility. In addition to obvious benefits for the workers, the institution saves money and gains a skilled employee with loyalty to the institution.

Through DEH's cooperative program, seniors at nearby high schools and trade schools receive training and job opportunities. The students work three or four hours each afternoon in a variety of trades and skills within the DEH.

A soldier intern program allows soldiers assigned to an engineering detachment at West Point to work with highly skilled master craftsmen in developing their own skills. For example, a soldier who wants to be a carpenter can apprentice himself to a skilled carpenter on the staff who works in the repair and maintenance of West Point facilities.

In addition to offering a variety of training programs, DEH also rewards good work. The "On the Spot" award is a cash award of up to \$250 that is given immediately to an employee for outstanding workmanship.

Environmental Protection

West Point's DEH is responding to the growing concern about the environment. In 1989 DEH elevated its environmental management office to an independent office with its own staff. West Point was one of the first agencies in its county to initiate a glass and newspaper recycling program.



University of Utah.

REGIONAL WINNERS: THE LARGE SCHOOLS

University of Utah

The University of Utah educates undergraduates, graduate students, and also operates a large medical school and hospital facility. The university, a major research center, is located at the edge of Salt Lake City in the foothills of the Wasatch Front.

Enthusiasm for the university, for the campus community, and for the physical plant staff comes through clearly in the University of Utah's application for the Award for Excellence. "We have a great staff," said physical plant director Pete van der Have. "I have never worked with a more committed group of people. In fact, the average physical plant employee has been here for ten years, and many have been on the staff for fifteen, twenty-five, and even thirty-five years," he said. "We like it here."

Energy Savings

The staff is proud of its state-of-the-art energy management system. Used to operate the HVAC systems in all major buildings on campus, the system monitors energy use by measuring the airflow across a filter medium. If the airflow falls below a certain level, the staff is notified automatically so that the filter can be replaced. "The new system allows us to make filter replacements as soon as needed. We no longer have to spend valuable staff time searching for problems," said van der Have. The system is also used to schedule workloads, and sometimes by the university police to monitor security. It has made a significant impact

on physical plant's operation, according to van der Have. The new system saves the university nearly \$1 million per year.

A Plan for Future and Backlogged Repairs

"The physical plant staff is committed to providing prompt and reliable maintenance of campus facilities," said van der Have. A new program is now being implemented that will enable the staff to anticipate needed repairs and to plan for them. Called Facilities Needs Inventory (FNI), the program is based on a building-by-building inventory that identifies all components and systems that could reasonably be expected to require replacement at some time during the remainder of the building's life. With this program in place, the physical plant department will be able to look ahead at least twenty-five years to determine the funds needed to maintain the campus. Van der Have hopes to make FNI available to other institutions in the Utah system so that funding requests from all the state schools can be presented uniformly to the Board of Regents and to legislative agencies.

In addition to carefully planning for future maintenance needs, the department is also committed to eliminating all backlogged maintenance jobs. In 1981 a complete room-by-room inventory was taken of all buildings on campus to identify items in need of attention. Approximately \$14 million worth of required maintenance work

was identified. The results of the inventory were computerized, allowing for easier tracking and scheduling completion of the backlog repairs. Backlogs at the University of Utah are much shorter today than they were a decade ago.

Money Management

Sound fiscal management is essential for physical plant to perform its many tasks. To make sure budgets are adhered to, each supervisor receives weekly budget status reports. The supervisor then must review and approve all expenditures against the shop's account.

To help make sure limited funds are spent as wisely as possible, the university employs an independent consulting firm to "watch over our shoulder" and ensure that the university is getting good value for money paid to suppliers. "In spite of recent funding cutbacks, the campus still looks good," said van der Have. Buildings are clean and safe, the response time to emergency calls has been reduced, and the staff receives many compliments on the good work it performs.

Customer Service

Most facilities management work is done behind the scenes. It is still important, believes van der Have, that the physical plant department have a good relationship with the campus community. A two-day training session has recently been instituted to help management become more attuned and more skilled in customer service.

Virginia Polytechnic Institute and State University

Virginia Tech is the largest university in Virginia. Its more than 100 major campus buildings are situated on a 2,000-acre campus in the Appalachian Mountains' New River Valley. Virginia Tech is an undergraduate, graduate, professional, and research institution.

"Given the large size of the university, the physical plant department is not very large," said F. Spencer Hall, assistant vice president for facilities and director of physical plant. "The workforce is highly dedicated, however, and they do an excellent job. The turnover rate is low."

Advances in Preventive Maintenance and Renovation

The physical plant department has developed a number of mechanisms to



Virginia Tech.

make its preventive maintenance and renovation efforts more effective and cost-efficient. For example, the mechanical and electrical divisions, working with the preventive maintenance division, have developed maintenance schedules for all pumps, fans, and air handling units to ensure that filters are changed, bearings are greased, and belts are tightened or replaced in a timely manner. By attending to parts on a scheduled basis, equipment is kept in good working order and breakdowns are far less frequent.

A unique feature of Virginia Tech's preventive maintenance program is its Air Quality Assurance Program. The purpose of the program is to improve air quality in campus buildings through the conscientious cleaning of air handling equipment and air distribution systems. The program was established in response to complaints from occupants of several campus buildings.

The physical plant department, an air quality consultant, and the campus health and safety office inspected and evaluated campus buildings for air quality. In those buildings identified as having bad air, the air handling systems' interior surfaces were cleaned thoroughly and painted with an antimicrobial paint. The intensive cleaning of the systems reduces contaminants in the recirculated air, and the painting helps prevent recontamination.

Since the program was established four years ago, it has expanded from three staff members to a staff of nine. Thanks to the air quality improvements made in many buildings, complaints have been reduced significantly.

Renovations are projects that often end up costing more than planners originally estimated. "With \$5 million worth of renovation taking place annually and most of it managed in-house," Hall said, "the need for accurate estimates and careful project management is paramount." To make sure that renovations at Virginia Tech stay within budget, physical plant developed its own cost accounting system.

Once a cost estimate is approved for a planned renovation, all associated project costs are entered into a computer. The system tracks job cost summaries and related information and incorporates several management reports. Any current work order can be classified by building, department, funding account, etc. The system also generates weekly reports detailing funds expended. Such frequent feedback enables the project staff to know right away if project spending is starting to exceed the budget.

Energy Conservation

Careful use of energy helps physical plant to be efficient and to save the institution money. For example, the campus power plant maintains hourly boiler operator's logs that are combined monthly to produce a report of steam generated, fuels consumed, boiler efficiency, and power generated.

Virginia Tech's 1926 "power house," a heating plant originally fueled by coal from campus mines, has evolved into a modern cogeneration facility. For eight months of the year the facility is run in a maximum generating mode with steam production introduced to the turbine generator

and the exhaust being used for campus heating. During the other four months of the year the facility is operated in a minimum generating mode with the turbine idle because there is no application for exhaust steam. Nevertheless, steam for cooking, heating, and other purposes is piped throughout the campus in a network of steam tunnels, serving more than five million square feet of campus buildings.

Rutgers University

Almost 48,000 students are enrolled at Rutgers, the State University of New Jersey. The university's five campuses offer a wide range of bachelor's, master's, and doctoral programs. Currently, Rutgers is engaged in the largest building program in the university's 213-year history as part of its effort to become a major state research institution.

Streamlined Procedures

"With the university in a state of accelerated growth, the office of university facilities has an enormous workload to manage efficiently," said Richard Engle, associate vice president for facilities. "We have instituted several new streamlined procedures to help Facilities handle the tremendous volume of work." The preventive maintenance program, for example, generates work orders automatically for scheduled maintenance and inspections for mechanical and electrical systems. These work orders cover more than 30,000 items as well as an increasing inventory of equipment on the five campuses.

To make cost estimates more accurate, all work orders by maintenance and operations are pre-estimated. This means that cost profiles are developed for various types of work so that projected costs can be compared with actual expenditures.

To further monitor expenses, each division within the facilities office is assigned its own seven-digit account code. Within that code, expenses are budgeted and recorded in four-digit sub-codes that are established for each type of expenditure. Weekly and monthly reports are issued, which describe the status of each division account.

Staff Development

The office of university facilities puts great emphasis on the development of a competent and dedicated



Rutgers University.

staff. "We are especially proud of our Craft Trainee Program," said Engle. The three-year program is open to all employees, and women and minorities are especially encouraged to enter the program. Participants receive on-the-job training while taking a supplemental evening course at a community college. Designed to offer career development help to interested employees, the program has produced skilled mechanics in the electrical, plumbing, carpentry, and masonry trades.

All new custodians spend their first two weeks on the job in training through Rutgers' Custodial Training Institute. The intensive orientation program provides employees with information on policies, procedures, and the proper use of equipment.

To support the university's commitment to promote from within, the Supervisory Management Development Program was instituted. When staff members are promoted to supervisory positions, they participate in a one-week program that addresses management skills. Ongoing help is also provided to managers through monthly forums. These "Monthly Management Moments" address time and stress management, how to identify and handle employee problems, and a range of other issues managers must confront.

Recycling

Rutgers is a leader among the growing number of campuses that are introducing recycling programs. In fact, the Rutgers' recycling program is the largest campus recycling program in the country. One-third of the university's total solid waste is recycled, including many kinds of paper and glass, corrugated cardboard, and alu-

minum. Last year more than eighty campuses requested information about Rutgers' program for use in establishing their own programs.

Rutgers sponsors the Center for Plastics Recycling Research, which was established to develop ways to recycle plastics into other products.

University of California at Riverside

UC Riverside, one of the nine campuses in the University of California system, is a 1,200-acre campus located sixty miles east of Los Angeles. UCR enrolls 8,200 undergraduate and graduate students and is recognized for its high proportion of undergraduates who go on to obtain a PhD. With its many agricultural programs, UCR is also a center for agricultural research.

Resource Management

Careful management of resources, both natural and manmade, characterizes the facilities management division of UCR. For example, the university is significantly expanding its use of integrated pest management on campus. This natural method of insect control is allowing a gradual phaseout of harmful pesticides.

By using data on the region's daily and weekly water requirements to grow particular crops, UCR's irrigation control computer saves water and money. The computer translates the information into water flow from terminals along 300,000 feet of control wiring in the fields. Through this system, the right amount of water can be used, and none is wasted. Savings of 15 to 20 percent are realized annually.

UCR's paint solvent recovery unit conserves solvent by recycling it. This process substantially reduces the need for disposal of a hazardous material and saves money. The unit works by



University of California/Riverside.

vaporizing the solvent and then recovering pure solvent through condensation.

The SMART Team

"Our facilities staff has introduced some new mechanisms to enhance the efficiency of our operations," said Sal Martino, executive officer, facilities management. "We are especially proud of SMART [Structural Maintenance and Repair Team], the mobile repair force that moves through the campus, building by building, searching for needed repairs that have not been reported and fixing them." The SMART truck is equipped with parts, tools, paint, and other repair materials that allow repairs to be made on the spot.

New Technologies

Other innovations from UCR include the following.

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Continued from page 34

computer in daily batches. The computer program includes an internal error checking function for automated quality control of data input.

Staff Recognition

"We have an outstanding staff," said Martino, "and I never want to take them for granted." Every month the campus facilities newsletter features "The Employee of the Month" with a photo and an article describing this month's outstanding staff member

and his or her contribution to the campus. The employee of the month is given use of a reserved parking space for the month he or she is being recognized.

"Our staff works so hard during the summer to get the campus in shape for students returning in the fall that we have to celebrate when school starts," said Martino. The supervisors organize and pay for a "Thank God School Started" barbecue to thank the facilities staff for all their work during the summer.



University of Puget Sound.

REGIONAL WINNERS: THE SMALL SCHOOLS

University of Puget Sound

Founded in 1888 as a small Methodist college, the University of Puget Sound today is a small, independent university with an undergraduate enrollment of 2,700 students. Situated on seventy-two acres of park-like grounds in a residential area of Tacoma, the school provides a liberal education with course offerings in a variety of arts and sciences.

Energy Saving Mechanisms

To stretch dollars and conserve energy, the physical plant department has installed some new systems. As a result of a comprehensive building-by-building analysis, the campus' entire utility service system was restructured. Previously, the central plant had to be run, even if the only needs were for process steam (used for kitchen and science equipment). Now, hot water generation is possible at each use point, with a central plant backup. "Even though the utility restructuring cost the university a hefty \$1.2 million," said Physical Plant Director Robert Bosanko, "it was worth it. In

the six years since restructuring began, the system has paid for itself and continues to save about \$275,000 per year."

Another money and energy saving step taken by physical plant was the installation of capacitors on the university's high voltage network. "The capacitors," said Bosanko, "will allow us to bring in less power by automatically correcting the level of power. This means a reduction in our billing penalty." Installation of the equipment cost \$3,200 and will pay for itself over time.

Maintaining the Campus' Distinctive Look

Like many college campuses, the University of Puget Sound has a distinct architectural look. The physical plant staff found a way to retain the campus' characteristic Tudor Gothic look even while making external repairs. "Many of the original wood sash casement windows are rotting," said Bosanko, "but we developed a way to install anodized aluminum thermal pane windows and frames

while leaving an old wood-framed window that is still useful." The color of the aluminum closely matches the original wood trim, so the building retains its Gothic look. The aluminum windows fit more tightly and are incorporated with a thermal break to save energy, according to Bosanko.

Physical Plant Participation in Decision Making

In addition to carrying out its mission to serve the campus and its buildings, the physical plant staff also participates in shaping the decisions that affect their work. When operating budgets are prepared, there are often too many valid requests for the limited funds available. At those times, physical plant managers and supervisors meet to discuss needs in the areas within the department. "It is so gratifying," said Bosanko, "that these people are realistic in their understanding of what is available and that they are resourceful enough to do a good job with the limited funding they do get."

When the university plans remodeling projects, the physical plant staff is consulted and encouraged to suggest cost and space saving strategies. For example, when the Student Center was slated for remodeling, kitchen facilities were to be moved. Since space was scarce, physical plant suggested deleting designated bakery space and baking equipment. Both money and space could be saved by using other ovens for baking and using them at night when they would otherwise be idle. The suggestion was taken, resulting in savings of both money and space.

Southern College of Technology

Part of Georgia's state-supported university system, Southern Tech is the nation's largest grantor of bachelor's degrees in engineering technology. Associate, baccalaureate, and master's programs are offered to the college's 4,000 students.

The facilities services division's motto, "Service in Support of Technology," reflects the division's support of the college's commitment to train engineers as well as its mission to care for the physical campus and buildings. The division's service responsibility is reflected in the approximately 300 service requests it receives and responds to each month and its daily cleaning of more than 600,000 square feet of classrooms, restrooms, and offices.



Southern College of Technology.

Commitment to Safety

"Safety is a high priority for the facilities services staff," said James Brown, director of facilities service.

"We provide our staff with an ongoing safety training program." Every month facilities sponsors at least one, and usually two, training sessions for its employees. Each one- to two-hour session addresses a particular topic. Videos are often used, and sometimes outside experts are brought in. Other times senior staff members may conduct the session. Some session topics are particular to one segment of the facilities staff, such as electricians. Sometimes more widely applicable safety elements are discussed.

Brown's efforts for greater safety go beyond the Southern Tech campus. Through the Georgia Association of Physical Plant Administrators, Brown conducts workshops around the state in asbestos removal. In these quarterly workshops, facilities staff members at a number of institutions are trained in the painstaking process of safe asbestos removal. Brown certifies graduates of the program, who are then qualified to remove asbestos from buildings. "Three staff members at Southern Tech are being trained, so that we can safely remove the asbestos in our buildings," Brown said.

Customer Service

To provide a rapid response to the needs of the campus community, facilities has divided the building and equipment section into two groups, maintenance and renovation. These groups are separate, but they overlap, allowing personnel to rotate between the two groups. With staff assigned to one of the groups at all times, there

are always personnel ready to respond to customers' needs.

"We have a great staff here at Southern Tech," said Brown. "Thanks to a genuine spirit of cooperation, our small size [seventy-two employees] does not keep us from doing a good job." Brown is proud of the fact that staff members are willing to pitch in wherever their help may be needed, even if the task that needs doing is not "in their job description." "From time to time, we have individuals helping out in other trades," said Brown.

University of Tulsa

"We aim to provide the best possible facilities and climate in which to support the instruction, learning programs, and public services of the university," said William Johnson, director of physical plant at the University of Tulsa. UT is a comprehensive, doctoral-granting research institution with approximately 3,000 undergraduate and 1,500 graduate and professional students. More than eighty undergraduate programs, twenty-five master's programs, and ten PhD programs are offered at the predominantly residential urban university.

Good Working Relations with Campus Community

"The physical plant staff at our school has an excellent relationship with the other departments on campus, and conflicts are rare," said Johnson. The department is interested in feedback from the rest of the campus about how well the physical plant staff is serving the university. For example, the physical plant department sent a questionnaire to all campus deans, department heads, and division

chairs asking them to rate the physical plant department on a scale of one to five in several key areas. The average score received was 4.5.

Only one deficiency was uncovered in the survey—in the area of electrical work. To correct the problem, physical plant instituted a new practice of assigning one staff electrician to do nothing but respond to campus repair requests for one month. Each month a different electrician is assigned that duty. With one individual responsible for all the work in this area, the work gets done efficiently. And by rotating that responsibility, the workload is fairly divided among staff members. When electrical work order requests come in that cannot be filled right away because of a lack of parts or some other reason, the staff makes sure that the person making the request is notified.

To ensure smooth communication between the campus community and the physical plant, each building on campus has one designated individual to be the liaison with physical plant. This person notifies physical plant when repairs are needed in that building. "By designating one person in each building," according to Johnson, "our staff can deal with a few responsible individuals on an ongoing basis. These people also come to know more about physical plant operations and about what can be done."

Technical Innovations

Two innovations have saved the University of Tulsa money. Physical plant installed a plate heat exchanger to handle building cooling needs during the winter months. The inner core of buildings can become overheated as

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University of Tulsa.



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New Mexico Military Institute.

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a result of lighting and other equipment, and the new device provides the cooling necessary to keep the core from overheating.

Physical plant also instituted a water recovery system in the campus swimming pool complex. Excess water was formerly discharged from the pool into a gutter and then into a sewer. Now, instead of going into a sewer, the water is transferred to a plastic holding tank. The water is then re-treated and returned to the pool. The \$800 cost of installing the recovery system paid for itself in just six months, and tens of thousands of gallons of water are saved yearly.

Continuing Staff Education

"We believe in offering educational opportunities for our staff," said Johnson. Apprenticeships are available in many of the trades, and managers are also encouraged to continue their education by taking management courses offered by the university. All job-related courses are paid for by the department, even those classes held during work hours.

New Mexico Military Institute

This unique state-supported institution, located in southeastern New Mexico, educates high school students as well as students in their first two years of college. An NMMI education provides a military background to those who go on to join the armed forces, and its academic programs allow graduates to continue on for a bachelor's degree at another college or university. NMMI is coed, with about 825 students.

Unique Responsibilities

In addition to their responsibility to

manage the institute's physical facilities, the physical plant department at NMMI has two unusual additional responsibilities. The campus is a designated site on the National Register of Historic Places. This means that all work done by the department must leave the historic appearance of campus buildings intact. Both the exteriors and significant interior spaces must be protected.

The physical plant department is also responsible for maintaining NMMI's horse stables. This means providing care for the institute's forty-seven horses as well as boarding other horses owned by cadets (students).

Safety First

"NMMI is a special institution, and our physical plant staff is committed to creating an environment that assures the smooth functioning of campus activities," said Velton Chancey, director of physical plant. "To help assure that smooth functioning, we put a great emphasis on safety."

All new physical plant employees are given a safety handbook that details the safe use of equipment and how to avoid possible safety hazards. To make sure the information in the booklet is read and remembered, supervisors review it verbally with new employees.

The entire physical plant staff attends regularly scheduled safety meetings. Each division within the department also holds safety sessions that address the particular equipment and conditions applicable to that division.

Safety seminars are regularly offered on timely safety topics. Titles include:

- How to Prevent On-the-Job Back Injuries

- Power Hand Tool Safety
- Push Mower Safety
- Large Equipment Safety
- Working with Pesticides

All physical plant employees are required to complete asbestos awareness training. Since the presence and removal of asbestos in campus buildings is such an important concern, the training is also offered to the entire institute staff and faculty as well as to all cadets.

To make sure that asbestos is removed safely from campus buildings, NMMI maintains a comprehensive asbestos management plan. "We are very concerned that all campus staff and cadets are protected from the dangers posed by asbestos, so all areas of the campus where asbestos is present are frequently examined," said Chancey. All releases of asbestos are noted, and the time employees spend in areas that contain asbestos materials are logged. All campus building supervisors are regularly informed of the status of asbestos-containing materials in their areas. Building supervisors are also kept informed about what steps they should take if they suspect a release of asbestos in their area.

Emergency Response Information

Physical plant publishes two valuable booklets for the entire campus community. All faculty and staff receive a copy of a booklet that explains all the services available from the physical plant and how to go about obtaining them. To make sure the entire campus is served at all times, physical plant frequently updates and distributes *Maintenance Emergency After Regular Hours and Weekends*. "It is important to us that cadets and faculty know we are available to handle emergencies whenever they happen, not just between nine and five," said Chancey.

Conclusion

The 1991 Award for Excellence in Facilities Management program is now well underway. Self-evaluation applications for the regional awards have been received and will be reviewed at the fall regional meetings. Regional winners will be notified in early December, and final applications for the international award will be due April 1, 1991. All 1991 awards will then be presented at APPA's 78th Annual Meeting next July in Orlando, Florida. ■

The Campus Environmental Crisis: Part 3 The Move to Recycle

by Barbara Ruben

Once the province of sanitation workers and maintenance personnel, trash has become a hot topic across the country for nearly everyone as bulging landfills near capacity, tipping fees skyrocket, and state legislatures pass strict waste-reduction laws.

At colleges and universities, recycling coordinators are being hired, pipes from demolished dorms are re-born as bike racks, and collection bins for everything from yesterday's newspapers to aluminum cans are popping up in dorms and academic buildings.

On and off campus, the garbage statistics are daunting.

Each person in the United States throws away about three-and-one-half pounds of trash each day. This adds up to nearly 180 million tons of trash a year, flooding landfills with enough garbage to fill 1,000 football fields to a height of thirty stories. This is nearly double the amount of waste the country produced in 1960.

The average resident of New York City throws away about four pounds of garbage a day. In Rome, each person generates one-and-one-half pounds of trash, and in Manila, Philippines, the amount is just over a pound, according to a report by the Worldwatch Institute.

Paper products account for the largest chunk of America's refuse, comprising 40 percent of what is thrown out. Yard waste follows at 17.6 percent, and glass, plastic, metal, and food waste make up the bulk of the rest of the nation's ever-growing trash heap. Packaging contributes about 30 percent of the weight, and 50 percent of the volume of household waste.

Most of this garbage is still hauled off to the nation's 6,000 landfills. However, the amount going to landfills declined from 81 percent in 1980 to 73 percent in 1988, according to a report on solid waste released by the U.S. Environmental Protection Agency (EPA) in June. In that time the

use of incinerators rose; they burned 10 percent of the country's trash in 1980 and 14 percent in 1984. About 13 percent of all trash is now recycled or composted, compared with 7 percent thirty years ago.

The EPA has no separate statistics for colleges and universities regarding the amount of waste generated or method of disposal.

Recycling gained a tenuous toehold on college campuses in the early 1970s when student groups sprang up to combat environmental degradation. The hallmark of many of the groups was a voluntary recycling program. Some of these groups have remained on campus for twenty years, while others have died off. Facilities managers are now trying to work with some of the existing groups or are starting recycling programs from scratch.

Rutgers University has had a recycling program in place since 1972. It started with student volunteers and one drop-off station and has expanded to eighty color-coded drop-off sites. Although many colleges and universities have been recycling, Evergreen State College in Washington has been recycling since 1978. Other schools,

such as Ohio State University and Hamilton College in New York, have jumped on the recycling bandwagon in the last couple years.

State legislation, shrinking landfill space, and a concern for environmental quality have fueled the drive to recycle. There is no federal legislation pending on recycling, but EPA guidelines encourage the recycling of 25 percent by 1992. Several states, such as New Jersey and Ohio, mandate that solid waste districts in the state recycle 25 percent already.

Many schools recycle such products as office paper, computer paper, newspaper, and cardboard. Others have expanded to aluminum and bimetal cans, bottles, lawn waste, and food waste. [Ed. Note: APPA's newest book, *Case Studies in Environmental Health and Safety*, includes chapters on recycling programs at Cornell University (NY), Dordt College (IA), and Rutgers University (NJ).]

Campus Recycling

All schools contacted for this article had some sort of recycling program planned or in place, and most are administered by recycling coordinators



Above: Rutgers University developed a logo for its recycling program.

Barbara Ruben is a freelance writer based in Chevy Chase, Maryland. She wrote on asbestos abatement in the Summer 1990 Facilities Manager. Part 4 of the series will focus on hazardous waste management.

or members of the physical plant department. Smaller schools cited both advantages and disadvantages because of their size; it is easier to set up collection, but more difficult to sell small amounts of recyclables.

Hamilton College in Clinton, New York has 1,650 students and started an ambitious recycling program last year when the county government mandated recycling. Glass, bimetal cans, aluminum cans, newspaper, white and computer paper, and cardboard are all separated at collection points in offices and dorms. The school bought its own two-ton truck to haul the recyclables to vendors.

"The problem with a small school is you can't get enough of separate types of recyclables to make any money," said Terry Hawkridge, who is the assistant director of maintenance and operations and calls himself the school's trash czar. "But with a little planning, a lot of purchasing can be recycling conscious, such as purchasing white paper instead of colored, which we don't recycle."

Most of the students are committed to recycling, but some professors appear too busy to bother separating their trash, Hawkridge said. Buildings, such as dorms, can be fined for not complying with recycling rules. First a warning is given, but fines of \$50 to \$100 can be levied.

At the College of St. Scholastica in Duluth, Minnesota the problem isn't so much the student body size of

1,900, but its rural location with no nearby markets for the waste it collects, said Joseph Koczan, physical plant supervisor. The school has implemented its paper, glass, aluminum, and cardboard recycling programs more slowly than desired because vendors cannot be found for their materials, he said.

Recycling is part of an environmental philosophy written right into the school's mission statement, which calls for each student and staff member to be "motivated to practical concern for the most beneficial use and conservation of human, environmental, and economic resources."

"If we're leading, the students will also take the initiative to recycle," Koczan said. "As an administration, we wanted to do something to raise their consciences."

Gary Rossman, assistant director for operations at the University of Illinois, Champaign/Urbana, said that at first he thought recycling would be a hard sell to other school administrators. Instead he found that they were enthusiastic. The school's recycling program was initiated by a student group that submitted a petition to the vice chancellor for administration and was approved in 1989.

"What I find so exciting is that the administration itself is so extremely excited," he said. "People are really getting into the recycling operation."

The state of Illinois has pending legislation that would require a 40 percent reduction in waste going to the landfill by the year 2000. The university is concentrating mainly on paper and cardboard recycling, materials that Rossman said make up 67 percent of the school's waste stream. Also on the recycling agenda are glass, aluminum and bimetal cans, and used motor oil.

But collecting and storing the large amounts of recyclables from a school with 35,000 students and 15,000 staff can present a safety problem, Rossman said. He and his staff are careful to check barrels and bins for leakage and make sure they adhere to local safety regulations, particularly fire codes.

The University of Oregon at Eugene recycles office, computer, and colored paper and newspaper as well as scrap metal, such as copper wire and brass. The staff plans to streamline the program to cut out some of the hours it takes to collect materials by making one centralized collection point in

each building. There is no recycling in dorms.

"Students are interested in giving recycling a lot of lip service, but it seems they'd like to get everybody to do it except themselves," said John Evans, the school's safety coordinator.

By contrast, Evergreen State College is an environmentally aware institution, said Vern Quinton, now the school's purchasing agent, who started the school's recycling program twelve years ago.

"Our program has been going so long, we've attracted a lot of people," he said. "To just dispose of trash in a landfill is such a waste of the world's resources."

The school recycles paper, glass, cardboard, and aluminum and is looking at recycling plastics. Handicapped adults employed by a sheltered workshop helps remove and sort the recyclables.

The University of Michigan in Ann Arbor has been hit with a double incentive to step up recycling. The county has mandated a 30 percent waste reduction by 1993, and a landfill only five miles away closed in 1988, forcing the school to haul its trash twenty-five miles away to another landfill.

The school now recycles paper and cardboard and is working on a contract with the city of Ann Arbor for glass and aluminum. In addition, the school composts leaves and reuses wooden pallets instead of dumping them.

In 1989, the school began a major effort to bring recycling to dorms. Waste closets have been converted to recycling stations where students bring cardboard and newspapers, said James "Buck" Marks, University of Michigan's recycling coordinator.

The University of North Carolina in Chapel Hill claims to have the largest recycling program of higher education institutions in the state. With 1,500 collection bins in more than 100 buildings on campus, the school recycles about thirty tons of white and computer paper alone each month. Aluminum cans are also picked up at these sites. Newspaper recycling began last summer, but only large generators of newspaper, such as libraries, are scheduled for pickup. The school also recycles scrap metal and wooden pallets and composts yard waste.

"Our program is just growing by leaps and bounds," said Rhonda Sherman-Huntoon, the school's recycling

Left: University of North Carolina/Chapel Hill has 1,500 collection bins throughout campus.





Paper bound for recycling at Cornell University.

coordinator. "We really got going before legislation was passed [25 percent of the state's trash must be recycled by 1993]. What really got us going was the student environmental action group, which even organized student groups nationwide."

Sherman-Huntoon instituted a recycling program for course packs, the photocopied supplemental books students are usually required to buy for courses each semester. She arranged with copy centers to put an ad in every copy asking students to recycle the books and a list of locations for recycling bins. During the spring semester this year, 675 pounds of the packs were recycled. The plastic binders that held the pages together are returned to the copy centers to be reused.

Innovative Programs

When students finish eating at the campus center's food court at Miami University in Oxford, Ohio, they dump their Styrofoam (the trade name for polystyrene) dishes in trash cans. But instead of heading for the landfill, these dishes are on the road to recycling.

Last summer, the school purchased a washing device that blasts the food debris off the Styrofoam with a high-pressure washer. Before purchasing the machine, they put their dirty Styrofoam on an airplane and flew it to Michigan to make sure the machine fit their needs. The school also recently bought a granulator that turns the clean Styrofoam into pellets, which are sold to a broker in Richmond, Indiana.

The impetus for purchasing \$15,000

worth of equipment to recycle the plastic product? A bill passed by the Ohio legislature mandating a 25 percent reduction in solid waste by 1992. The food court generates about six cubic yards of Styrofoam a day.

"We're really on the cutting edge for this one," said David Roberts, who is associate director for building services and who is also the town's mayor. "No other university is doing this; McDonald's is about the only other company in the country trying it."

Miami is also embarking on another recycling program that few universities have tried: shredding used newspaper for lab animal bedding. Previously the school bought shredded newspaper, but when administrators realized they had plenty of their own newspapers to contribute and could cut down on waste at the same time, they decided to provide their own animal bedding. [Ed. Note: To find out how the University of Vermont has dealt with this program, see "Recycling Newspapers Into Animal Bedding," in the September 1990 APPA Newsletter.]

The campus has seventeen locations where office, computer, and newspaper is recycled in offices and dorms, and cardboard is picked up. The school also plans to build a composting facility.

Even less populous areas such as North Dakota are feeling the landfill crunch. Most landfills in the state may be closed in ten years, according to LeRoy Sondrol, director of physical plant at the University of North Dakota in Grand Forks.

Construction and demolition ma-

terials are scavenged from on-campus jobs to determine what can be reused. Old concrete is recycled into retaining walls and metal pipe refashioned into bike racks.

"We consider just about anything that can be reused, from light fixtures to doors," said Sondrol, who calls this an "underplayed" area for recycling at colleges and universities. He estimates his school saves \$200,000 on construction materials alone each year.

The school also recycles paper, but has had a tough time finding a company to take it off its hands because of the school's rural location and soft market for newsprint. The University of North Dakota also prints its publications with a soybean-based ink, which can be easily recycled. Many times paper cannot be recycled because of the type of ink with which it is printed, Sondrol said. This fall, aluminum cans are scheduled to be collected for recycling.

"If only we could figure out a way to recycle snow, we'd have it made," he quipped.

Rutgers University converted its volunteer-run program to a university-governed operation and beefed up the kinds of materials recycled. Wet food waste from dining halls is refrigerated and sold to cattle and pig farmers. The school's six dining halls feed 15,000 students, and wet garbage is picked up for about \$5 for a 55-gallon drum. In 1988, the school recycled 1,391 tons of food waste.

Glass, aluminum, and plastic in food service facilities are separated by hand for recycling. All the dining halls have used compactors since 1976 to reduce the volume of non-recyclables to plastic-wrapped cubes.

Rutgers is also home to a research center for plastics recycling, which in the future will have a plant to recycle Styrofoam. Plastics are now being collected from dining halls and taken to the research center.

The High Price of Trash

Horror stories of landfill tipping fees tripling and quadrupling in just the last few years abound. And with recycling markets glutted, some facilities managers are paying vendors to take their trash for recycling instead of the other way around. Schools are divided on the issue of cost effectiveness, with some administrators who believe recycling makes both environmental and economic sense. Others say recycling will never pay, but it is

an essential part of the school's solid waste management program nonetheless.

At the University of Michigan, landfill tipping fees took up 17 percent of the total operating costs budgeted for trash removal. This year, tipping fees accounted for 34 percent. And a 14 percent increase in tipping fees was slated to begin October 1.

Vern Quinton at Evergreen State College calls recycling very cost effective. He is getting \$140 per ton for computer paper and \$20 per ton for newsprint. But he concedes that one of the reasons the program is profitable is because it is so well established.

"I always hate to hear people say that it costs more to recycle than disposing of trash in a landfill," Quinton said. "What it may be is that disposal is already budgeted, but money for recycling is not."

Rutgers University broke even at first, but now recycling is costing more money than landfilling, said Vern Coston. Before recycling became mandatory in New Jersey, he would get \$10 per ton for newsprint. Now, he said he has to pay \$25 per ton for someone to take it off his hands.

Terry Hawkrige of Hamilton College said recycling will never be cost

effective on his campus, despite the fact that he's getting \$120 per ton for computer paper and \$60 per ton for white office paper. Although the school is paying less in tipping fees, one-and-one-half positions had to be added to collect and process the recyclables. The school's trash budget rose from \$33,000 in 1984 to \$156,000 for 1991.

Finding nearby buyers for materials to be recycled is the University of North Dakota's biggest stumbling block, LeRoy Sondrol said. Materials from Grand Forks have to be shipped to Minneapolis for recycling.

"Legislation is really the key," Sondrol said. "There will be markets as the law changes both on state and national levels."

Recycling at the University of Illinois has been cost effective, but chiefly because a nonprofit recycling group in the community has actively promoted the school's program and also hauls away their materials. Next year, however, because of sluggish markets, the school will have to pay to have their recyclables picked up.

"We can't sit around waiting for the markets to optimize," Gary Rossman said. "We have to get into it today and make our mistakes and learn from them now rather than later."

Beyond Recycling

For some facilities managers, part of the solution to the solid waste dilemma comes before recycling, landfilling, or burning and is painfully simple: stop producing so much trash. Source reduction is easier said than done, but some schools have begun concerted efforts to cut down on waste.

At the University of North Carolina, people are reusing paper "like crazy," according to Rhonda Sherman-Huntoon. The College of St. Scholastica and the University of Oregon have banned Styrofoam from their campuses. The University of Illinois is determined to reduce office paper use by cutting down of amounts of copying and significantly reducing campus mailings. At Hamilton College, flyers and mailings are frowned upon if they are on any paper except white, which is the only color recycled by the school.

"With our recycling program we're telling students, 'We're not dealing with just you anymore. We're dealing with your kids,'" said Hawkrige at Hamilton. "They hear this and all of a sudden they grow up. What we're doing is working." ■

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Resource Management

On Time

Whether you are faculty, staff, or student, you expect to be able to look at the campus clocks and tell what time it is. And, you expect it to be the correct time. Louisiana State University (LSU) has developed a portable clock signal generator to help campus clocks stay accurate.

For many years clock repair jobs have been tedious and time consuming. The several thousand clocks on campus were connected to a master clock system that could send correction signals out only once per hour. The faulty clock would have to be removed from the wall and returned to the shop for repairs. To find out if the clock was correct, the repair person would have to wait for the hourly signal.

Martin Mumphrey, electronic technician, designed and built the generator that connects with the main campus clock. This device can set four individual clocks per hour at any time during the hour.

The generator cuts repair time and money. Total labor savings totaled \$14,850, and the generator cost only \$72.44. The National Association of College and University Business Officers awarded LSU \$1,000 for the generator in its cost reduction incentive awards program.

Energy Reduction

Virginia Commonwealth University is saving \$92,000 a year, or 21 percent of its previous utility consumption cost. This savings includes \$62,000 in electrical costs and \$30,000 in natural gas costs.

How did they do it? VCU made its lighting, heating, ventilation, and air conditioning more efficient. In 1987, the institution received a \$113,916, 50-50 matching grant from the Virginia Department of Mines, Minerals, and Energy. With this grant, VCU implemented an energy reduction program in the James Branch Cabell Library. Part of the program included separating the environmental controls of the Rare Books Room from the

Stephanie Gretchen

main air handling system. The temperature and humidity are now controlled by a self-contained, computer room air conditioning unit that allows the books to be maintained and preserved properly.

The renovations allow campus maintenance and library administrators to monitor the temperature and humidity on each floor and the electrical usage for the building. Prior to the renovations, the 215,000-square foot, five-floor library was consuming 242,010 ccf of natural gas and 6,367,680 kilowatt hours of electricity each year. Consumption is now estimated to be lower than 163,510 ccf and 4,844,680 kilowatt hours. VCU realized a 32 percent reduction in natural gas and a 24 percent reduction in electricity.

Research

Many institutions of higher education are feeling the effects of lower enrollments. To combat this trend and to ensure that Indiana University remains a major research institution, the school's physical plant recently established a new position—research and facilities coordinator. This position will take care of researchers' needs by using physical plant resources.

Jeff Alberts, special assistant to the chancellor for life sciences research, said the researchers appreciate knowing there is someone dedicated to helping them and the research facilities. "The more rapidly we can build or renovate research facilities, the more efficient our IU labs will be. This will make a real difference in our ability to attract outside funding." He also mentioned that this will help attract and keep "top-flight" researchers.

In the fall of 1989, IU's physical plant hired Erwin Schindel. Gary Kent, director of physical plant, explained that Schindel is the project coordinator for the research facilities. Schindel learns what is happening with grants and helps prepare the labs for these incoming programs. He has the responsibility for any needs in the nine major labs on campus through

the entire project, from customer relations and ordering materials, to being the resource person for architects and building occupants. Because grants take a lot of planning, physical plant needs the advanced notice in order to have the facilities in shape in time for the research, said Kent.

The job is still evolving, Kent said, and physical plant and the researchers are working together to finetune it.

Management

The Miami University (OH) physical facilities department has started doing business in a new way—participative management. This program involves the employees in workplace decision making and problem solving through increased free communication, both upward and downward.

Six months ago Roger Rowe, director of physical facilities, held a brainstorming session with his principal staff on how to improve things in their department. They wanted to get the workers involved in the department's decision making. Before they could do that, the managers and supervisors needed to get involved with and understand participative management and quality circles.

During the past six months Rowe has worked with his principal staff of supervisors and managers explaining and teaching them about these processes to make sure they understand quality circles and what management's responsibilities are.

During this training period Rowe also wanted the entire staff to know what he was planning on doing. Sheets describing the process of participative management have been routed with the department newsletter and posters have been hung.

The idea behind participative management is that since employees have

Correction

The temperatures for the University of Kuopio shown on page 48 in the summer Resource Management column were incorrect. Temperatures from December through March are about -10°C to -20°C (14°F to -4°F), but at times it goes down to -30°C (-22°F). Please excuse the mistake.

Stephanie Gretchen is assistant editor of Facilities Manager and editor of APPA Newsletter.

more knowledge of what is going on, they are able to make better quality decisions and their morale is greatly improved. The employees take responsibility for meeting overall objectives, and that gives them a sense of independence, pride, and ownership in their work and the university. Participative management increases their sense of teamwork also because they are more involved and have more invested in their job.

"This is strictly a volunteer effort," said Rowe. "Everyone needs to want to do it." The drawback to this kind of program is people that do not want to do it who see themselves as losing power. Also, the leadership of the department has to be sincere and follow through. In order for this program to work, Rowe and his principal staff have to be available to the participants and have to follow through with their suggestions.

This program changes the old idea of "you do it my way or else." Now it is, "here's the problem, let's solve it." Participative management is one way to become more productive, while improving morale.

Rowe said that since initiating the program, "Cooperation, communication, and trust have improved tremendously in the managers and supervisors. It has really paid off."

Handicapped Evacuation

Emporia State University (KS) has developed a detailed evacuation plan for the disabled people on campus, which won first place in a national competition sponsored by the American Association of State Colleges and Universities, National Organization on Disability, and the J.C. Penney Company.

Tom Poston, fire safety officer, Keith Frank, coordinator of disabled student services, and Ray Notson, director of university facilities, developed a plan that uses "safe rooms" in each building that protect disabled people until they can be safely removed from the dangerous situation. Each safe room includes twenty-minute fire doors, one-hour fire walls, and special telephone hookups to the campus operator. The plan assigns assistants to the disabled people to help get them to a safe room and in touch

with the operator. The names, class schedules, and type of disability of all disabled people are listed in one central location on campus.

In an emergency situation, once the disabled person contacts the operator, his or her location is given to emer-

gency personnel, who will then evacuate them.

During simulations several disabled students tested the plan while working closely with the Emporia Fire Department. Safety officials and students alike support this plan. ■



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Data Base Update

COPING WITH THE MUNICIPAL MENTALITY

Municipal mentality is a brain disease. Its symptoms include compulsive worrying about coffee breaks, workplace lethargy, and excess concern over job descriptions. The initial outbreaks first appeared in various departments of motor vehicles; unfortunately, quarantine measures were ineffective and the syndrome has spread to other industries. Currently, it's often found in municipal planning boards and building departments.

If you or staff members deal with this deal kind of mentality, Intermedia Design Systems software will minimize your exposure while maximizing your success. Using a specially designed data base, IDS converts building fire and energy codes from printed text to computer data.

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Howard Millman

many references the governing code contains or the unlikely places they appear within the code, the computer finds and displays it for you. As a result, you save time and avoid multiple appearances before review boards because you have all the information, including annual updates and amendments, coherently collected and intelligently assembled.

IDS's proprietary data base employs two systems for searching codes. The first consists of a sophisticated keyword search. Using one or more keywords (combined with modifiers such as "near" or "and")

the program highlights all sections pertaining to the words you specified. For instance, you might search for references about fire doors, then limit the search by specifying fire doors and shutters near exits.

The second search method is broader and involves stepping through a series of menus listing topic headings (similar to a book's table of contents). Each subsequent menu brings you closer to the reference you need.

Beyond its slick search features, IDS's computerized code programs contain other useful features. These include a clipboard (for storing or transferring data), bookmarks (to hold your place while you continue exploring), mouse support, text copy, and merge as well as full printing capability.

Prices range from \$200 to about \$1,000, depending on the complexity of the code they are covering. As I write this, IDS's coverage is somewhat spotty. They have, for instance, many of New York's and Massachusetts' state and local codes data based, as well as isolated codes from municipalities around the United States. By September of 1990, however, they expected to have hundreds more on-line. If they do not yet have the code you are interested in, IDS will provide an estimate for databasing any code, set of standards, or local ordinances.

Large institutions should also ask about IDS's pcTRAQ, a system that stores key data on hundreds of past, present, and future construction projects. pcTRAQ is not a financial or project management application; it functions by crosslinking names, addresses, dollars, departments, and other descriptive data cells. If you deal in that kind of volume, then pcTRAQ's \$895 price tag may prove a worthwhile investment.

Converting your university's, town's, or city's code into computer searchable form will unquestionably speed the design and application phases of all your major capital work. You can present your plans for review with the knowledge that you considered all the important criteria. So until science or economics conquers the municipal mentality, computers will at least provide temporary immunity for your staff.

For more information contact Intermedia Design Systems, Inc., 15 Century Hill Drive, Suite 100, Latham, NY 12110; 518/783-1661.

Howard Millman is assistant director of facilities at Columbia University's Lamont Doherty Geological Observatory in Palisades, New York, and Nevis Nuclear Laboratory in Irvington, New York.

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Two-Year Institutions

Evaluating Major Components of Two-Year Colleges, ed. Richard I. Miller. Washington: College and University Personnel Association, 1988. 132 pp. \$32, hardcover.

Education covers a broad spectrum. Miller has targeted his attention on the evaluation process for two-year colleges. He immediately states, without academic fanfare, "The purpose of this book is to assist administrators in two-year colleges to understand and initiate better policies and procedures for evaluating students, full-time and part-time faculty members, administrators, programs, student services, external relations, and the institutions themselves." He convenes a huddle of contributors that proceed to set forth their practical experience on each of the major evaluation areas covered. Adherence to the declared purpose is set forth in an understandable format presented in a style that accentuates the positive attributes of the evaluation process.

For ease of review the ten chapters may generally be classified under the following divisions: the role, effectiveness, and the future of evaluations; the range of individuals evaluated; and external forces and evaluation.

The Role, Effectiveness, and Future of Evaluations

Examinations of the institutional organization reveals that a process is needed by which it can determine purpose, measure accomplishment, and define future needs. The authors cite the *The Encyclopedia of Educational Research* (Mitzel, ed., 1982), "evaluation aids in the decision making process, and recognizes the political ramifications" as a mechanism by which these criteria may be achieved. Here they set in motion the tools available to assess the means to measure progress, for students, faculty, or staff to effectively employ strategies resulting in sound educational management.

It is recognized that problems will occur during the evaluation process, and a chapter points out some obvious, and some not so obvious, areas to avoid. Although not intended to be exhaustive, it is informative and worthy of attention. Of special note is the chart, an institutional evaluation system for two-year colleges, graphically depicting a model easily pursued. Following the chart are several paragraphs suggesting the role of each participant. The authors' statement, "To review, refine, and redefine the community college role, evaluation becomes necessary," succinctly states the purpose of institutional evaluation.

The Range of Individuals Evaluated

It is safe to say that few problems are more complex and controversial in the area of evaluations than that of determining the worth of job performances. In this section several different authors address the evaluation of student, full-time faculty, part-

time faculty, and administrative performance. Brief discussions ensue on the various components of student and employee evaluations, including a short description of in-place models from institutions in different states.

It is worthy to note that no fewer than three authors tackle the ever hot, ever sensitive issue of faculty evaluation. Undetectable in this division was prejudice in either direction. The basic premise appears to be to have an effective plan derived by administrators and faculty, having a feedback system solely aimed at improving overall competence. This too is based on the propitious proposition that, the major ingredients of an educational institution are faculty members, with a piece of chalk, in front of a chalkboard.

External Forces and Evaluation

Here it is pointed out that demographic, economic, and social changes impact the educational environment much more than most administrators would like. Budgets may be affected by tax collections, buildings are or are not built on the support of alumni, state and local governments are crucial to economical well-being of the community college, and business and industry impact the educational environment. The theme most visible in this chapter, is the idea that positive relationships between these external forces need not be based on random providence, but must be developed and cultivated to produce the good fruit expected of education.

Evaluating Major Components of Two-Year Colleges does not partake in a smidgen of pay dirt and then try to salt a gold mine with it. The authors did not succumb to a few facts, magnificent intro, "hot air" midpoint, and pyrotechnic finish so common in today's fast paced society. The facts were gathered and set forth in a clear, concise manner without pontifical enumeration of credentials.

Could it be that the accumulation of material from many different sources, and the ability of the editor to mix it and transfer it to paper as readable, connective, and authoritative, and have the reader absorb and digest it is a result of practicing the evaluation process? It is a good book, well worth reading for those interested in the evaluation process.

This book is available from CUPA, 1233 Twentieth Street, N.W., Suite 503, Washington, DC 20036.

—Rick Lee

Director of Physical Plant
Columbia State Community College
Columbia, Tennessee

The Bookshelf

Quality Circles

Quality Circles: A Practical Guide, 2nd edition, by Mike Robson. Brookfield, Vermont: Gower Publishing, 1988. 158 pp. \$40, softcover.

This book purports to present a practical approach to quality circles and their role in participative management. By narrowly defining a quality circle and by promoting a single implementation strategy, this book fails, in my opinion, to achieve what its title states.

The early part of the book provides a most basic background for differing management philosophies, and explains how quality circles may be integrated in those philosophies with significantly differing results. It also provides a brief historical perspective of the development of Statistical Process Control by the Japanese in conjunction with Dr. W. Edwards Deming, and the transfer of those quality concepts to the United States.

Chapter four is a smorgasbord approach to listing quality training organizations on a worldwide basis. This information is of little value to the quality circle practitioner; the information is disjointed and difficult to assimilate because it includes a multitude of similar acronyms. The book's jacket states that this chapter was added to the second edition. The question is, why?

Chapter five includes a simplified explanation of the core principles of quality circle concepts. This includes the necessity for volunteerism, the focus on things that can be influenced, and the ownership of the process, including the adult-adult contract, data based problem solving, realistic time perspectives, and the development of a win-win philosophy. This fifteen-page chapter is a good, concise explanation of quality circles. It is well suited to the quality circle newcomer and may be worth reading if available in a library collection.

The remainder of the book explains in some detail the implementation of a quality circle program and the roles played by facilitators, group leaders, circle members, and outside resource personnel. A major fault is that most of the book is devoted to explaining the use of eight audio tapes, 200 visual aids, and a handbook for the circle members. It is essentially a series of lesson plans for the Gower Quality Circle Programme and is of little value to anyone other than a trainer committed to using that program.

It should be noted that Gower is the publisher of this text and also sells the tapes, visual aids, and certificates of completion. This book contains a sales thrust for the Gower Programme that I find offensive.

Another, albeit minor, irritant is the use of British spellings and nomenclature that at times may create less than precise understanding for American audiences.

I cannot recommend this book to any of my colleagues, since a multitude of other

choices abound for learning the basic concepts of quality circles.

This book is available from Gower Publishing Company, Old Post Road, Brookfield, VT 05036.

—Ronald R. Maassen

Physical Plant Director
Waukesha County Technical College
Pewaukee, Wisconsin

Negotiations

The Right Ball, by Taylor Alderman. Washington: College and University Personnel Association, 1989. 158 pp. \$40, softcover.

The Right Ball in many respects is not just a primer for management negotiators, but a complete course that identifies many subtle and sophisticated aspects of collective bargaining.

I found the book easy to read and comprehend. Alderman states his theme and then develops it with a sense of purpose and without losing sight of it. He follows through with a logical development of negotiation strategy.

The use of this text as a primer has some value to facilities managers, but the emphasis on academic and unclassified personnel does not relate closely to physical plant operations. In almost all cases the staff relationships in facilities departments are nonacademic. With greater emphasis and case studies on nonfaculty bargaining, this would have made an excellent reference text for all first- or second-time negotiators or bargaining team members. The value therefore to facilities organizations is marginal.

I would like to have seen more emphasis in the opening chapters on what climate facilitates union interest. This would provide guidelines to give institutions that do not presently have unions.

Alderman gives excellent information on how a chief negotiator communicates with different levels of administration. He emphasizes the need for that kind of communication after the agreement is reached.

The sample items used are especially helpful for the first-time negotiator. They would also serve as a useful refresher or reminder for the more experienced.

The chapter on strike planning is excellent. It directs the reader to the probabilities and possibilities of a strike. The checklist of points to consider is especially worthwhile.

The author identifies three concepts important to the "life" of a negotiator or a negotiating team.

1. The calendar year must be kept in mind when considering an extension of an agreement. An extension that gives the union a calendar advantage may create more grief in the long term.
2. Negotiators should be prepared for criticism from administrators who have never been involved in bargaining or who have no idea of the complexity of negotiations.

3. "Most issues in institutional life are 'political' in the sense that a critical dimension of any proposed action is its potential for acceptance or rejection by the persons who will be affected."

Finally, Appendix B contains a glossary of terms that in itself is worth the price of the book and is most valuable to the first- or second-time negotiator or the members of the team.

This book can be ordered from CUPA, 1233 Twentieth Street, N.W., Suite 503, Washington, DC 20036.

—Ralph E. Tuomi

Assistant Vice President
Facilities Management
Oregon Health Sciences University
Portland, Oregon

Leadership

The Leadership Challenge, by Gareth Morgan. San Francisco: Jossey-Bass, Inc. Publishers, 1987. 362 pp., hardcover.

The Leadership Challenge draws from extensive research by the author and presents his findings and conclusions in an organized and interesting manner. The book is divided into seven proven techniques for excellence in leadership.

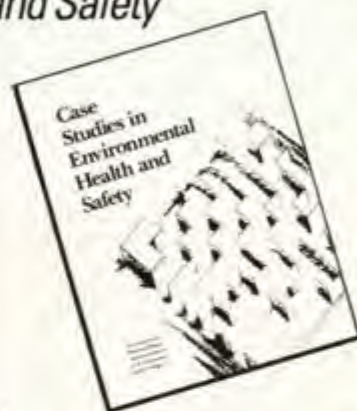
This book is motivational reading for anyone in a leadership position. The author interviewed 500 middle- and senior-level managers in an attempt to capture what made them successful leaders in their organizations. Their conclusion is that there are certain common traits that all leaders have. The book breaks these traits into five basic practices and ten specific behaviors. The five basic practices identified by the author follow:

1. Challenging the Process Leaders are pioneers and quickly recognize good ideas and support those ideas with a willingness to challenge the system in order to put them into practice.
2. Inspiring a Shared Vision Leaders possess the desire to make something happen. Leaders breathe life into the hopes and dreams of others and enable them to see the excitement of what the future holds.
3. Enabling Others to Act Leaders know teamwork and collaboration are essential in securing a feeling of strength in an organization. This is the most important of the five practices.
4. Modeling the Way Successful Leaders are willing to go first and lead by example. Effective leaders allow their values to govern the course of an organization. Encouragement of ethical behavior by example is a requisite for effective leaders.
5. Encouraging the Heart Leaders use creative ways to acknowledge the accomplishments of individuals in an organization, the key to retaining an excellent work force.

The author believes that leadership can

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be learned and delineate the means of doing so in suggesting ten behavioral commitments that were evident in their research. These commitments are search for opportunities, experiment and take risks, envision the future, enlist others, foster collaboration, strengthen others, set the example, plan small wins, recognize individual contributions, and celebrate accomplishments.

The author also examines what followers expect of leaders—"the art of getting others to want to do something you are convinced should be done." Honesty was ranked as the most important characteristic followers expect in leadership. Followers want to know that their leaders are truthful, ethical, and principled persons. The author distinguishes between managing and leading in numerous ways, but integrity is the most important consideration observed in their research.

The book, while interesting reading, should not be read in one or two evenings. It is best read a part at a time, taking time to assimilate the concepts as they are presented. Each of the seven parts of the book is filled with examples of what has worked for leaders in many different positions. The research material is presented in concise yet interesting and readable form. The book is filled with examples of specific ideas that have worked for leaders in many different situations. The time spent

in reading this book will pay dividends many times over. *The Leadership Challenge* should be read by every physical plant administrator interested in improving his or her leadership skills. It will provide a new perspective in many areas and it will renew concepts that are tried and proven.

This book is available from Jossey-Bass Inc., Publishers, 350 Sansome Street, San Francisco, CA 94104.

—Art Jones

Director of Physical Plant
Black Hills State University
Spearfish, South Dakota

Customer Relations

Managing to Keep the Customer, by Robert L. Desatnick. San Francisco: Jossey-Bass, 1987. 179 pp. hardcover.

With all of the discussions and articles that have been written with regard to servicing our constituents and how we need to improve our service and the corresponding opinion of our service, I thought this book would be both interesting and worthwhile. There are a number of good points throughout the book and many examples from the fast-food industry, mostly McDonalds.

The book states that customers are rightly insisting on getting what they pay for, whether it is clean glass, an impeccable

hotel room, a decent meal in the hospital, an on-time delivery, or courteous treatment at the point of purchase. The importance of this is that we need to provide service to our customers with the utmost concern for quality and timeliness. In cases where the customer is captive and must deal with the service, there is a tendency to provide the service without courtesy or interest.

Service companies strive to add new customers and new services when business is good, but they lose touch with the customer base that allowed them to continue in business. Where we have captive customers, possibly, we also strive to undertake too many additional services and forget the things that are or should be our base services. As we grow, we overlook what it is we should be doing, and we don't give the effort and support to our employees to instill in them the concern for our customers and the services provided.

In business, the greatest source of profit growth will come from better management of human resources. Good employee relations equals good customer relations. To those institutions that operate on fixed budgets, better management of human resources becomes possibly more critical. Labor represents the largest single ingredient of our operating budgets. For many of us, improving customer satisfaction is to pro-



Call For Presentations

The 1990-91 Educational Programs Committee invites all physical plant personnel to submit presentation ideas for the 1991 Annual Meeting.

The theme for the upcoming meeting is "Achieving Facilities Equilibrium" and the committee is looking for papers to support this concept and other topics of interest to facilities administrators.

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vide more and better services with present staffing and funding levels.

A section of the book deals with leadership and mirrors most other texts on the subject. As management takes on the necessity of better management, the day of the "old boss" must change.

A great deal was made in the text about fast food chains hiring at minimum wage and yet instilling in their employees the benefits and satisfaction in serving the customer. In higher education we are not hiring at minimum wage, but we still are not paying the scale of most businesses or industries. We can select the best person for the job at whatever scale we have. If McDonalds can hire at minimum wage and have employees excited about their company and the job they do, why can't we also hire custodians and grounds employees and instill in them the great benefit and satisfaction of serving the customer?

Most of us have a program in effect for our custodial personnel, yet very little is done for our grounds personnel who contribute greatly to the first impression of our institutions by prospective students and visitors.

How do we rate or appraise customer service performance? There are a number of ways similar to those response cards we see in restaurants and hotels. Do you ever get a response card from your closest McDonalds? What type of medium do we use, and what do we do with it when it is returned. Is it specific enough to address issues? There are two chapters in the book that can assist in devising such a survey.

Any survey, including customer surveys and our own employee opinion surveys, can be useful if used properly. What we are saying is, "You are important to us and we respect you. We care about you and we will use your input to make this a better place to work." A survey will lose all credibility with participants if the results are used to initiate personnel actions such as terminations, or not used at all.

It is the CEO of an organization who sets the tone and overall commitment to customer service. If we want our organizations to become customer-oriented and truly concerned for the service we provide, we must take the initiative and make the changes by increasing training and participation, including making difficult changes within ourselves.

The book was a bit disappointing in that too much attention was devoted to the fast food industry. It is worth adding to your library for future reference if you are seriously interested in treating anyone that receives your service as a customer. On a scale of 1 to 10, I would give the book about a 6+.

Managing to Keep the Customer is available from Jossey-Bass, Inc., Publishers, 350 Sansome Street, San Francisco, CA 94104.

—T. R. Wray

Director, Operations and Maintenance
University of Houston
Houston, Texas

Age Discrimination

Age Discrimination: An Administrator's Guide, by Nicholas Di Giovanni Jr. Washington: College and University Personnel Association, 1989. 165 pp. \$45, hardcover.

Employer-employee relationships pervade almost every field of human activity. Throughout history human activities have been separated into those that are permissible or required of one group but prohibited to others. The act of recognizing variations within characteristics is an expression

of ability. It becomes discriminative when such distinction is made in favor of or against a specific characteristic. Such conditions become ethical dilemmas.

Di Giovanni's book successfully investigates and discusses the legal issues of the age discrimination taking place in higher education. First, it is necessary to state that the author is a highly qualified expert in labor relations. Second, this book addresses administrators of colleges and universities adopting appropriate attitudes and focusing their attention toward what is



DI GIOVANNI

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right and humane. Third, I agree with the author, as I have personally been subjected to and survived a wide range of prejudices.

"Discrimination in the work place," according to the author, "can only be eradicated by the efforts of such men and women in educating supervisors/administrators and the staff in general on the illegality and immorality of such conduct."

"Age discrimination" is a two-way street. One way is "too young, not enough experience," the other is "too old, uses outdated methods."

Serious examination of age discrimination in institutions is a study of dilemmas faced by intellectuals.

This book contains nine chapters. The first chapter is an overview of the legal complexities of age discrimination, as compared with race, faith, or sex discrimination. It includes procedures used for filing, timing, and legally processing charges, and is simply and clearly outlined.

The approach to proving such allegations is treated in the second chapter. The concepts of "direct" and "circumstantial" evidence are conclusively exemplified.

The third chapter contains illustrative legal cases regarding hiring, retirement, and action plans or requirements, with commentary regarding the decisions of a federal district or circuit. In all examples are

cases in which faculties are contenders.

Early retirement plans with possible related benefits are presented in chapter four. The author outlines methods that are capable of becoming a double-edged sword, slicing away both weak or strong personnel.

The fifth chapter poses an important ethical question: "Can an employee waive the right to file charges of discrimination?" It is a very sensitive point. Legally, the waivers are "permissible and binding" on both parties if the document was knowingly and voluntarily negotiated in good faith. The guide presents circumstances in which the parties disagreed, with the results going in opposite directions, such as "take-it-or-leave-it." In conclusion, the author states: "The discussion must emphasize both the care and consistency that must be applied to any proceeding dealing with a plaintiff claim."

Chapter six describes in detail various possible "practical schemes" to be used by employers to maintain a work environment free from age harassment and thus to lower the risks of legal liability.

Chapter seven presents practical work required after age discrimination charges have been filed.

"With mandatory retirement, the employee has no choice but to try to brace for

the fateful day. However, even when retirement is voluntary, the transition can remain difficult."

These alternatives, as well as planning considerations, are extensively presented in chapter eight.

In the final chapter the author presents differences in the state age discrimination legislation. This chapter also outlines the various requirements for filing, record keeping, and reporting.

The book is a valuable document intended to guide administrators. The examples used in the book are primarily representative of college and university employees, with emphasis on faculty. The guide could also be of value to an employee who believes he or she may be the subject of age discrimination. Such situations can exist within the personnel of physical plants and facilities. The legal aspects and approaches may be similar.

The main objectives of Di Giovanni's book is to construct a guideline of a rational framework for employment in this era of increasing sensitivity.

This book is worth reading and is available from College and University Personnel Association, 1233 Twentieth Street, N.W., Suite 503, Washington, DC 20036.

—Alfred M. Rozeiu

Professional Engineer

Canadian Memorial Chiropractic College
Toronto, Ontario, Canada

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