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# WICHE REPORTS

On Higher Education In The West

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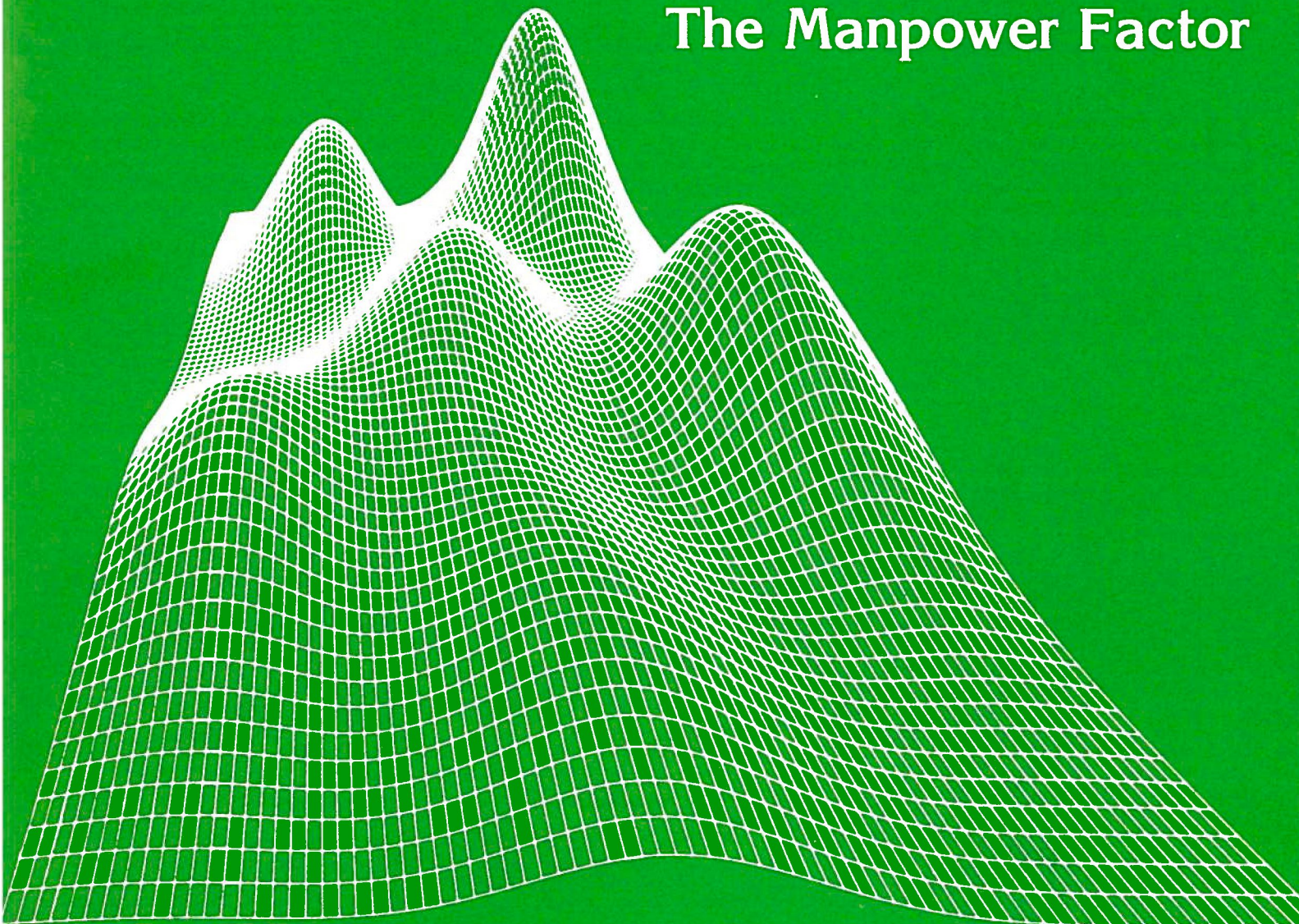


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Volume 27, Nos. 2 & 3, Summer/Autumn 1982

## High Technology in the West

### The Manpower Factor



Alaska Arizona California Colorado Hawaii Idaho Montana Nevada New Mexico Oregon Utah Washington Wyoming





# Regional High-Technology Effort Involves Higher Education, Business, Government

**H**igher education, state governments, and private industry are joining forces across the West to meet a major state, regional, and national challenge—the education of manpower for the high-technology industries critically important to the 1980s.

In its broadest sense, this combined effort concerns the economic prosperity of each western state as well as the nation because the present inability of colleges and universities to meet industry's need for certain types of high-technology manpower threatens to erode our country's competitive economic position.

These high-technology manpower problems are complicated by a number of other factors: slowing growth of productivity in the U.S., a decline in the concentration of scientists and engineers engaged in research, diminishing investment of resources in training engineers and other high-technology professionals, and generally low levels of mathematical and scientific skills among American students.

What can higher education do to combat these problems? The top priority for higher education is to increase the number of trained persons in technologically based fields, particularly engineering and science, while at the same time maintaining and improving the quality of programs in these fields. These goals are fraught with obstacles—shortages of faculty, obsolescent equipment and facilities, and ever-rising numbers of applications from students.

## KEY REGIONAL ISSUES

The western states currently employ 46 percent of all high-technology workers in

the nation. The West's explosive development in high-technology and energy industries is placing increasing stress on higher education to produce an adequate supply of trained manpower for certain fields across the region.

A report analyzing the supply and demand picture for high-technology manpower in the West will be available from WICHE this fall. A preliminary analysis of the data points to a number of issues:

- The current demand for engineers, computer scientists, and geologists is straining the capacity of existing educational programs.
- There is a shortage of faculty members in engineering and computer sciences; major reasons for the shortage include declining doctoral production, faculty salaries inconsistent with pay scales in industry, and limited research opportunities.
- Most schools are unable to maintain state-of-the-art equipment because of rapid obsolescence and high replacement costs, resulting in students who frequently are ill-prepared for the demands of the job market.
- There are weaknesses in forecasting manpower needs in high technology so that the manpower supply is often out of balance with industry's demand.
- Minorities and women are seriously underrepresented in high-technology and energy-related fields at all levels of degree production.
- Continuing education needs are expanding for persons already employed, calling for educators to work

with industry to design appropriate curricula and provide needed research.

## A REGIONAL APPROACH

In order to examine these issues from a broad, interstate perspective, WICHE has convened a Western Technical Manpower Council representing Alaska, Arizona, California, Colorado, Hawaii, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, and Wyoming. The council will assist WICHE in devising cooperative solutions to shared problems.

The council, which met for the first time June 1, includes three western governors, legislative leaders from several states, presidents and chancellors of major universities, and industrial and business leaders from across the West (see membership list in this issue).

"This council has the opportunity to stimulate effective partnerships among government, education, and business that will be essential in meeting the economic challenges of the next decade and beyond," said Gov. Vic Atiyeh of Oregon, co-chairman of the WICHE council and chairman of the Western Governor's Conference.

At its initial meeting, the council decided to focus on such problems as:

- shortages of faculty to train workers in high technology;
- inadequate equipment and facilities for teaching and research;
- the need for more effective manpower planning in engineering, computer science, and geophysical sciences;
- the quality of education programs and delivery systems;



- inadequate secondary school preparation in science and mathematics;
- underrepresentation of women and minorities in high-technology fields; and
- the need for greater participation by industry in all of these areas.

This fall, the council will draft recommendations to higher education, state governments, and business and industry on these topics with the intent of stimulating joint, cooperative responses to the challenges identified.

"By addressing these issues on a regional level," noted WICHE chairman Kerry Romesburg of Alaska, "we will be better able to cope with the challenges of balances, services, and opportunities for our citizens with the management of local and state resources."

The council's recommendations will provide a springboard for meetings in each of the thirteen states early in 1983 to review individual state efforts; share information on approaches in other states; and develop

action plans appropriate to each state, including cooperative activities among the various segments and across state lines. A regional conference later in 1983 is planned to convene leaders from the relevant sectors to review the outcome of the thirteen state meetings and to design interstate resource sharing efforts.

### TASK FORCES

Two technical task forces have also been formed by WICHE to provide advice and assistance to the WICHE staff and the regional council. One task force, chaired by Vince Haneman, dean of engineering at the University of Alaska, Fairbanks, is composed of engineering deans from each of the western states. The second task force, chaired by Lyle Wilcox, president of the University of Southern Colorado, is composed of representatives from computer science and geosciences and represents both community college and university concerns.

"The task forces have brought us in close touch with deans and faculty on the front line, who are faced with rising student enrollments and the problems of recruiting new faculty members for their programs," said Holly Zanville, director of WICHE's Economic Development Program. The interest and assistance of these task forces has underscored for WICHE the importance of working together on behalf of state and regional concerns, she said.

Phillip Sirotkin, WICHE's executive director, said identification of the critical issues in high-technology manpower provides western states the opportunity to develop innovative, cooperative approaches based on the region's history of interstate and interinstitutional achievements in higher education.

Further information on WICHE's project in high-technology manpower is available by contacting the WICHE Economic Development Program at (303) 497-0230.

WICHE

## High-Technology Manpower: Some Highlights

### Supply

- ☐ There was a 30 percent increase in the number of graduates with bachelor's degrees in engineering from 1971 to 1980, compared with an 11 percent increase in all fields. Doctoral degree production declined over the same period by 31 percent, compared with a 2 percent increase in all fields.
- ☐ Blacks, American Indians, and Hispanics received only 4.3 percent of all baccalaureate engineering degrees awarded from 1980-81 in the West.
- ☐ Women received 9.4 percent of baccalaureate engineering degrees in the same period and 7 percent of the graduate degrees.
- ☐ More baccalaureate computer and geological science degrees are being awarded, both in absolute numbers and in relation to other disciplines in the West.
- ☐ The West is recording modest gains in the number of advanced degrees awarded in high-technology fields, including increasing its share of master's and doctoral degrees awarded.
- ☐ Thus, western universities are key producers in the overall supply of engineers and geological and computer scientists with advanced degrees.
- ☐ The availability of specialty training in these fields, however, varies considerably from one state to another, suggesting that access to certain specialty training is limited at this time.
- ☐ A recent survey by the American Council on Education (ACE) identified 10 percent of all faculty vacancies as unfilled, forcing some institutions to limit enrollments in high-technology fields and to cut back admission of transfer and nonresident students.

### Demand

- ☐ Nationally, there is a low rate of unemployment for engineers (under 2 percent from 1979 through 1981) and a continued high demand for new engineers as indicated by the level of salaries offered new graduates (average: \$24,000 per year to start).
- ☐ Studies by the National Science Foundation and the American Electronics Association point to shortages of electrical and computer engineers and computer scientists. Other surveys are mixed with regard to earth scientists, petroleum engineers, and systems analysts. Supply and demand in other science and engineering disciplines were found to be at least in balance.
- ☐ These findings, as well as those of other studies, appear to corroborate current industry statements of need.
- ☐ While conclusions concerning future demand are tenuous, long-term projections to 1990 suggest supplies will be in balance with demand in most fields and that surpluses may exist in many.
- ☐ According to the NSF, 1990 will find shortages in some specific fields (computer science, industrial and computer engineering, and perhaps aeronautical engineering) but a balance between supply and demand in most other areas. Exact numbers are difficult to pinpoint.
- ☐ Shortages of faculty in engineering and computer sciences are expected to persist, according to the ACE and others.



# Western Technical Manpower Council

## Co-chairmen:

Vic Atiyeh, Governor of Oregon  
John Young, President and Chief Executive Officer, Hewlett-Packard

## Alaska

Vince Haneman, Dean, School of Engineering, University of Alaska, Fairbanks

Terry Miller, Lieutenant Governor

Kerry D. Romesburg, Executive Director, Alaska Commission on Post-secondary Education; WICHE Chairman

## Arizona

Russell Nelson, President, Arizona State University

Darrow Tully, Publisher and Executive Vice President, Phoenix Newspapers, Inc., (*Arizona Republic* and *Phoenix Gazette*)

## California

Patrick Callan, Director, California Postsecondary Education Commission; WICHE Chairman-Elect

Glenn Dumke, Chancellor Emeritus, California State University

William Frazer, Academic Vice President, University of California

Patricia Hill Hubbard, Vice President of Engineering Education, American Electronics Association

William Kays, Dean of Engineering, Stanford University

John F. O'Connell, Past President, Bechtel, Inc.; Senior Executive Consultant to the Bechtel Group of Companies; Chairman, Board of Trustees, California State University

Russell O'Neill, Dean, School of Engineering and Applied Science, University of California, Los Angeles

Simon Ramo, Director, TRW Inc.

Howard Slack, Vice President of Technology, Atlantic Richfield Company

Thomas L. Stevens, President, Los Angeles Trade-Technical College

John Vasconcellos, State Assemblyman

John Young, President and Chief Executive Officer, Hewlett-Packard

## Colorado

Fred Anderson, State Senator; President, Colorado State Senate

Duane D. Pearsall, Chairman, Mountain States Association; Vice Chairman, Colorado Council on Small Business

Robert Polutchko, Vice President of Technical Operations, Martin-Marietta Aerospace

Harrison Shull, Chancellor, University of Colorado at Boulder

Richard Steinhour, Vice President, Amoco Minerals Company

Lyle C. Wilcox, President, University of Southern Colorado

Timothy Wirth, Congressman

## Hawaii

Patricia Saiki, State Senator; Member, Amfac Board of Directors

## Idaho

John V. Evans, Governor

## Montana

David Hunter, Montana Commissioner of Labor

W. Paul Schmechel, President, Montana Power Company

Lee Walker, Chairman of the Board, Northern Testing Laboratories

## Nevada

James Gibson, State Senator

## New Mexico

Henry Jaramillo, Jr., President, Ranchers State Bank; Chairman, Board of Regents, University of New Mexico

Morgan Sparks, Dean, Robert O. Anderson School of Management, University of New Mexico; Former President, Sandia Corporation

## Oregon

Vic Atiyeh, Governor

Vera Katz, State Representative

Robert MacVicar, President, Oregon State University

Bill Walker, Executive Vice President, Tektronix, Inc.

## Utah

Donald Holbrook, Attorney; Member, Utah Board of Regents; WICHE Commissioner

Thomas di Zerega, President, Northwest Pipeline Corporation

## Washington

Barney Goltz, State Senator

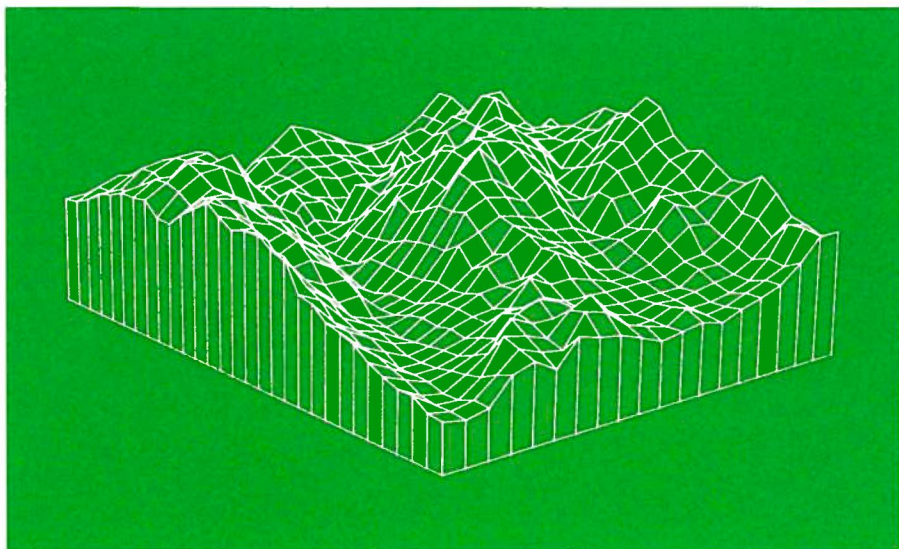
Ancil Payne, President, KING Broadcasting Company

Hunter Simpson, President and Chief Executive Officer, Physio-Control Corporation; Member, Board of Regents, University of Washington

John Spellman, Governor

## Wyoming

Donald Veal, President, University of Wyoming; WICHE Commissioner



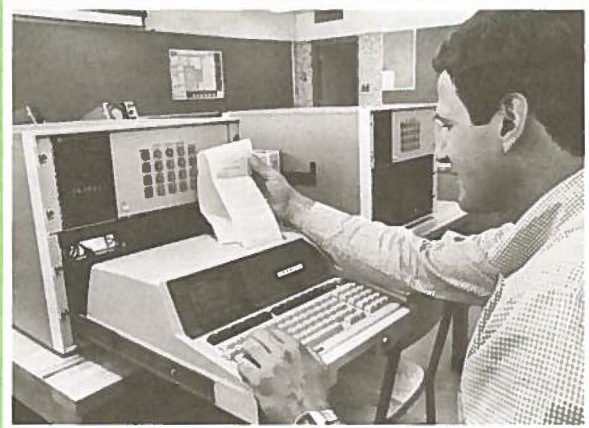
Background materials prepared by WICHE for its Western Technical Manpower Council are now available in a single volume, *High Technology in the West*. It provides a discussion of the major issues relating to high-technology manpower, presents profiles of each of the thirteen western state efforts related to high-technology education, and summarizes other regional and national efforts to deal with the issues. The report, which combines three preliminary papers, is available for \$5.00 from WICHE's Publications Secretary, P.O. Drawer P, Boulder, CO 80302. Please cite the WICHE publication number, 2A113, when ordering.



## Some Steps to Improve High-Technology Manpower



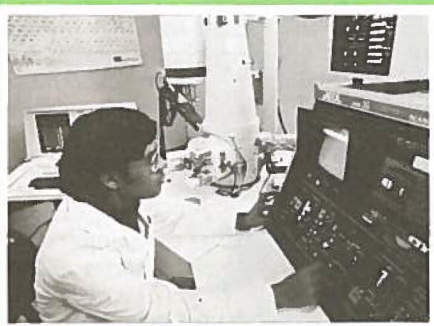
**Incentives to encourage outstanding students to seek academic careers and to retain faculty in those careers.**



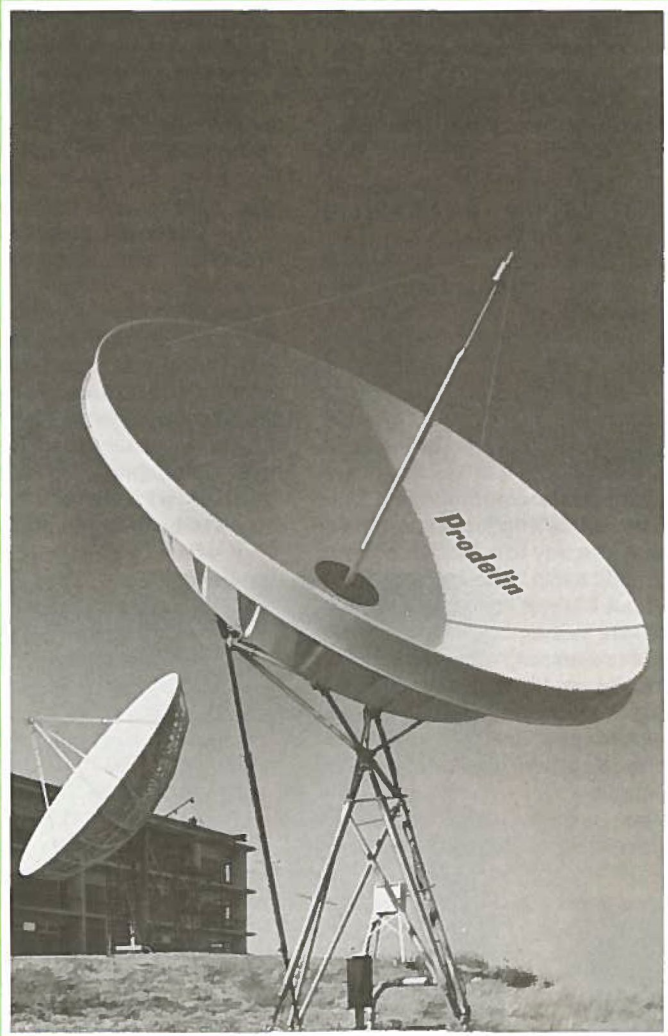
**Modernizing instructional and research equipment and facilities, often through a partnership of higher education, government, and business.**



**Stressing improved and expanded mathematics and scientific skills of students at secondary levels.**



**Expanded efforts to recruit and retain minority and women students in high-technology fields.**



**Current courses in rapidly changing fields are brought to the work site, often through telecommunications.**



# Higher Education + Corporate America

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## Toward More Productive Partnerships

By

William R. Monat  
President  
Northern Illinois University

and

W. John Pembroke  
Director, Planning and Budgeting  
Northern Illinois University

**T**o say that we are living through uncertain economic times is an understatement of major proportions. The erosion of revenue streams into state coffers has been coupled with increases in mandated state outlays as the federal government passes social programs to the state level without the concomitant fiscal resources necessary to fund them. Precisely at the time when state governments should be increasing their level of funding to higher education, particularly public institutions, they find themselves least able to do so.

In order to replace state resources which have been lost to colleges and universities during the past several years through the ravages of inflation as well as through absolute base budget reductions, academic institutions must be willing to reorder their relationships with corporate America. Higher education has been far too insular in the past with respect to the way in which it regards private sector corporations.

The uneasy, arm's length relationships of the past must give way to a much more proactive interrelationship. This involves funding support but it is not limited to this. Frequently, private sector corporations have vast arrays of raw research data without fully appreciating the wealth of information they have, let alone understanding its potential for examination and analysis which can lead to the development of new knowledge and technologies.

Universities, for their part, are neither fully aware nor sensitive to the resources they

possess. Corporations typically commit 2 to 5 percent of their annual budgets to research and development activities; higher education, on the other hand, typically devotes three to four times greater resources to research activities. Academe also has invested over time in the creation of a critical mass of research expertise spread across a variety of disciplines. The breadth and depth of this resource is unparalleled in the private sector, even among firms heavily engaged in research and development activities.

It would seem, then, that the key is formulating the infrastructure and organizational mechanisms to optimize the relationship between higher education and corporate America. This is most striking in the instance of applied scientific research and the role that it can and should play in the evolution and development of high technology.

The persistent fears of "contamination" associated with conducting joint research projects with private sector corporations need to give way to cooperative undertakings which have saliency for a corporation on the one hand, while simultaneously protecting and guaranteeing absolutely the intellectual integrity of the research undertaking on the other.

Corporations must be willing to invest in academic research by providing funding, equipment, raw data, and the like without feeling they are in a position to dictate the consequences or results of any particular research activity. This is not a novel arrangement but, one suspects, an exceedingly difficult characteristic for a corporate executive to exhibit due to responsibility and accountability to shareholders in a corporation for profit and earnings performance. Faculty members, on the other hand, must exhibit a willingness to be less suspicious of corporate motivations. There needs to be a realization that a great many corporations have research goals and objectives in common with those of higher education.

This is not to say that there are not some profound cautions that colleges and universities must exercise as they develop linkages with private sector corporations. Certainly the basic tenet of intellectual freedom to pursue knowledge for its own sake cannot be violated. It is this environment which makes possible the potential contributions of basic and applied research to the private sector.

Despite the constraints, the rewards for developing such linkages are substantial for both parties. Institutionally, it affords an opportunity to pursue and expand current research beyond levels possible under existing fiscal conditions as well as providing a mechanism to fulfill an institution's research objective—namely, the expansion of knowledge and benefit to the broader society.

### ROLE OF THE STATES

For the most part, states have failed to take full cognizance of the variety of factors that influence economic development and expansion. The simple presence of a state agency charged with economic development ensures virtually nothing. While tax structure and the quality of the labor pool are important factors, they are not in and of themselves a panacea. Without the development of new technologies and the recognition of the pivotal role that higher education plays in regard to research and development, many state governments all too frequently wind up simply "reshuffling" the various components of their economic base without experiencing genuine new growth and expansion.

This is somewhat surprising given the rich tradition of cooperative state-institutional-private sector efforts in the area of agriculture. The extension services and research support in new technologies, supported by public funds and passed through to private sector agri-business concerns, has worked effectively and beneficially for some time. What is needed is a



Monat



Pembroke



major policy initiative with respect to public funding of institutionally based and technologically oriented research which would benefit directly private sector corporations.

**S**tate commissions of economic development should expand participation to include representatives from higher education and corporations. There is a need for ongoing substantive policy analysis and development leading to an aggressive and fully participatory role of the state and institutions of higher education in supporting high-technology corporations.

One of the principal roles the state can play is providing and developing integrated state investment and taxing strategies to precipitate cooperative undertakings between corporations and education. One potential source of capitalization for research and development activities is in the area of state-supported pension funds. Although these pension funds typically are statutorily independent, it might be feasible in many instances to redirect their investment strategy toward targeted high-technology industries and research efforts at colleges and universities. For example, a pension board would likely feel much more inclined to invest in high-technology industries and support high-technology research and development if there were a commitment by the state to obligate the state's general revenue fund to provide a minimum rate of return on the investment of those funds.

Another useful role that the state can play is the establishment of substantive advisory boards or task forces that have actual policy input to the governor and top agency heads as well as to legislative leadership. In this way, the state can play a useful facilitator role in creating new cooperative structures and formal linkages between higher education and corporations.

Ultimately, states must be willing to provide risk capital to corporations in the form of tax incentives as well as direct funding to those institutions with research missions and capabilities. Despite distressing economic realities now, commitment by a state of even 1 or 2 percent of its general fund to high-technology development and the funding of research activities contains extraordinary payback potential.

### CORPORATE ROLE

Corporations are considering new ways to support research and development and increasingly look toward institutions of higher education to supply the bases for new technologies that will spur growth in productivity. For example, university researchers working in university laboratories made the initial discoveries upon which the near revolution in bio-engineering was almost totally based.

A number of corporations have established high-level staff positions with the explicit responsibility of providing a liaison to institutions of higher education for basic and applied research. This is a necessary first step but it is not fully sufficient. Corporations must increasingly become directly involved with higher education through the establishment of advisory boards and working committees. The benefits of this type of relationship is apparent when one considers the diversity and richness of the human resource base as well as the wide variety of other fixed cost items such as institutional overhead, research facilities, and equipment which universities have in place.

It is not uncommon to find that it requires one and one-half to three times more fiscal support for a full-time researcher in a corporate structure than on a number of college and university campuses. A major reason for this is their fundamental differences in mission. Institutions typically invest in human capital and spend anywhere

from 75 to 85 percent of their regular operating budgets on personnel. Corporations simply are not in a position to devote this level of resource to research-oriented personnel.

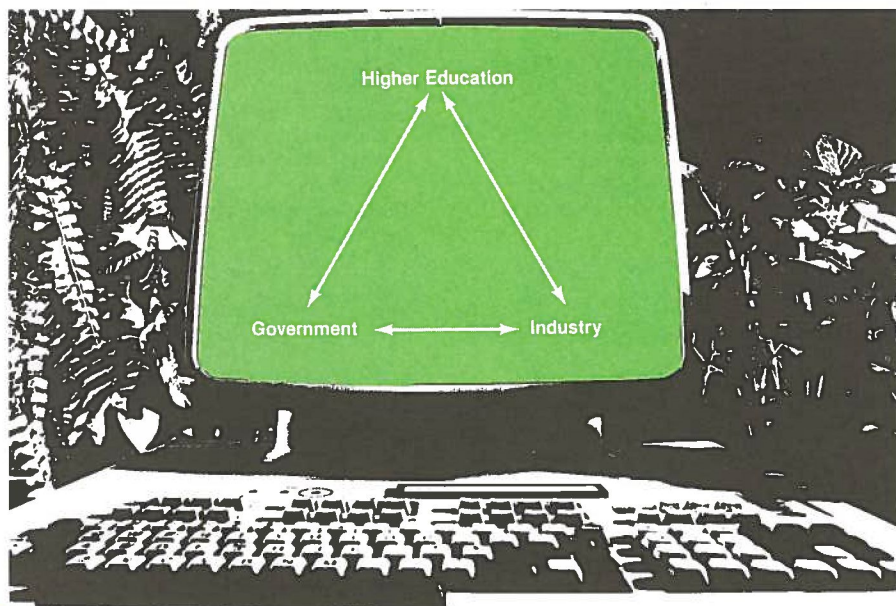
In order for corporations to share in the benefits which can derive from basic and applied research and the development of new high technology, corporate budgets must increasingly recognize the importance of providing tangible support to college and university research endeavors. Even a one-half of 1 percent increase in the share of a corporate budget devoted to research and development and made available to higher education would provide a major new impetus for increased research activities on campuses. Failure to move aggressively in this area will likely see the continuation of a slow and steady decline in institutional research activities due to increasingly constrained institutional budgets and the primacy of the instructional mission.

### CONCLUSION

The value of industry-university cooperation in research and economic development is that it promises to further scientific and technological innovation. A culture that is innovative will be a vital one, for it will be both intellectually and economically sound. General societal interests are served by cooperative research endeavors.

There are several factors which should induce the corporate world to participate in such joint research undertakings. Among these are: (1) discoveries may be made which lead to the development of profitable products or processes; (2) the training of graduate students that occurs in research activities may provide a reservoir of talent from which key industrial personnel may be drawn; (3) a larger body of knowledge that underlies the field of industry's operations

(continued on page 16)





# Western State Higher Education Governing and

State higher education boards and agencies perform a variety of important functions: responsive planning, budget review and recommendations, program evaluation and approval, institutional licensure and approval, and policy recommendations for adequate provision of postsecondary opportunities for citizens.

The role and authority of the boards and agencies vary from state to state. In general, they can be classified as either governing or coordinating bodies.

**Governing boards** are legally responsible for the management and operation of the institutions under their governance. They develop and recommend budgets to the governor and legislature and are responsible for budget management and operational policies after appropriations are made. And they have authority in relation to institutional management and operation and personnel policies.

**Coordinating boards or agencies**, on the other hand, are not legally responsible for institutional management and operation. While most of them are involved in budget development and recommendation, they have little or no responsibility for budget management and operational policies of institutions after appropriations are made. Their governance powers are limited or nonexistent.

Listed below are the state structures for coordination and governance of postsecondary education in the thirteen western states. The boards designated as statewide coordinating boards vary widely in their responsibilities and powers. The same is true of boards designated as statewide supervisory boards for two-year institutions. Not reflected here are, in some states, area vocational schools that provide some postsecondary instruction, but which generally are under the supervision of the state board of education.

## States with a single statewide governing-coordinating board for both two-year and four-year institutions

Alaska*	Nevada
Hawaii	Utah

\*Alaska also has a separate agency designated as a statewide coordinating board.

## States with a single governing board for four-year institutions which also has supervisory role relative to the local governing boards of the two-year institutions and with no other coordinating board

Idaho	Montana
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## States with a statewide coordinating board and multiple governing boards

California	Oregon
Colorado	Washington
New Mexico	

## States with multiple governing boards but only a nominal statewide coordinating board

Arizona	Wyoming
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## Individual State Structures

	Number of Campuses Governed	
	Two-Year Institutions	Four-Year Institutions
<b>ALASKA</b>		
<b>Statewide Governing-Coordinating Board</b>		
Board of Regents, University of Alaska	11	3
<b>Statewide Coordinating Board</b>		
Commission on Postsecondary Education	—	—
<b>ARIZONA</b>		
<b>Nominal Statewide Coordinating Board</b>		
Commission for Postsecondary Education	—	—
<b>Governing Board for Four-Year Institutions</b>		
Board of Regents	0	3
<b>Statewide Supervisory Board for Two-Year Institutions</b>		
State Board of Directors for Community Colleges	—	—
<b>Local District Governing Boards for Two-Year Institutions (9)<sup>a</sup></b>	15	0
<b>CALIFORNIA</b>		
<b>Statewide Coordinating Board</b>		
Postsecondary Education Commission	—	—
<b>Governing Boards for Four-Year Institutions</b>		
Board of Regents of the University of California	0	9
Board of Trustees, California State University	0	19
Board of Governors, California Maritime Academy	0	1
<b>Statewide Supervisory Board for Two-Year Institutions</b>		
Board of Governors, California Community Colleges	—	—
<b>Local District Governing Boards for Two-Year Institutions (70)<sup>a</sup></b>	107	0
<b>COLORADO</b>		
<b>Statewide Coordinating Board</b>		
Commission on Higher Education	—	—
<b>Governing Boards for Four-Year Institutions</b>		
Board of Regents, University of Colorado	0	4
Board of Agriculture	0	3
Trustees of the Consortium of State Colleges	0	4
Board of Trustees, University of Northern Colorado	0	1
Board of Trustees, Colorado School of Mines	0	1
<b>Governing Board for State System Two-Year Institutions<sup>b</sup></b>		
State Board for Community Colleges and Occupational Education	10	0
<b>Local District Governing Boards for Two-Year Institutions (4)<sup>a</sup></b>	6	0

Note: The general descriptions of state higher education governing and coordinating boards and agencies are adapted from *Challenge: Coordination and Governance in the '80s* (Denver, Colo.: Education Commission of the States, 1980).

<sup>a</sup>Number of districts

<sup>b</sup>Also functions as state-level supervisory board for local district two-year institutions.

<sup>c</sup>Also has supervisory role relative to the two-year institutions.

<sup>d</sup>Is coordinating board for all levels: elementary, secondary, and postsecondary.



# Coordinating Boards and Agencies: An Overview

	Number of Campuses Governed			Number of Campuses Governed	
	Two-Year Institutions	Four-Year Institutions		Two-Year Institutions	Four-Year Institutions
HAWAII					
Statewide Governing-Coordinating Board Board of Regents, University of Hawaii	6	3			
IDAHO					
Governing Board for Four-Year Institutions <sup>c</sup> State Board of Education and Board of Regents, University of Idaho	0	4			
Local District Governing Boards for Two-Year Institutions (2) <sup>a</sup>	2	0			
MONTANA					
Governing Board for Four-Year Institutions <sup>c</sup> Board of Regents of Higher Education	0	6			
Local District Governing Boards for Two-Year Institutions (3) <sup>a</sup>	3	0			
NEVADA					
Statewide Governing-Coordinating Board Board of Regents, University of Nevada System	4	2			
NEW MEXICO					
Statewide Coordinating Board Board of Educational Finance	—	—			
Governing Boards of Four-Year Institutions With Two-Year Branches					
Regents of the University of New Mexico	3	1			
Regents of New Mexico State University	4	1			
Regents of Eastern New Mexico University	2	1			
Governing Boards of Four-Year Institutions					
Regents of New Mexico Highlands University	0	1			
Regents of Western New Mexico University	0	1			
Regents of New Mexico Institute of Mining and Technology	0	1			
Governing Boards of State-Controlled Two-Year Institutions					
Regents of Northern New Mexico Community College	2	0			
Regents of New Mexico Military Institute (Includes 4-year high school)	1	0			
Local District Governing Boards for Two-Year Institutions (2) <sup>a</sup>	5	0			
OREGON					
Statewide Coordinating Board Educational Coordinating Commission <sup>d</sup>	—	—			
Governing Board for Four-Year Institutions State Board of Higher Education	0	8			
Statewide Supervisory Board for Two-Year Institutions State Board of Education	—	—			
Local District Governing Boards for Two-Year Institutions (13) <sup>a</sup>	13	0			
UTAH					
Statewide Governing-Coordinating Board State Board of Regents	5	4			
WASHINGTON					
Statewide Coordinating Board Council for Postsecondary Education	—	—			
Governing Boards for Four-Year Institutions					
Board of Regents, University of Washington	0	1			
Board of Regents, Washington State University	0	1			
Board of Trustees, Central Washington University	0	1			
Board of Trustees, Eastern Washington University	0	1			
Board of Trustees, Western Washington University	0	1			
Board of Trustees, Evergreen State College	0	1			
Statewide Supervisory Board for Two Year Institutions State Board for Community College Education	—	—			
Local District Governing Boards for Two-Year Institutions (23) <sup>a</sup>	27	0			
WYOMING					
Nominal Statewide Coordinating Board Coordinating Council for Postsecondary Education	—	—			
Governing Board for Four-Year Institution Board of Trustees, University of Wyoming	0	1			
Statewide Supervisory Board for Two-Year Institutions Community College Commission	—	—			
Local District Governing Boards for Two-Year Institutions (7) <sup>a</sup>	7	0			





# Report on WICHE

## Student Exchange

Western states are supporting 1,370 students in sixteen professional fields this academic year through WICHE's Professional Student Exchange Program (PSEP). Preliminary figures show that the students' home states are paying over \$11.5 million in support fees to the schools in which their students are enrolled. As of August 1981, 1,338 students were participating in the program, with \$10.2 million in state support.

Through the program, students pay reduced tuition to study fields not available in their home states, while the states pay the schools support fees to help meet the cost of educating their residents.

The exchange currently encompasses the fields of medicine, dentistry, veterinary medicine, physical therapy, occupational therapy, optometry, podiatry, forestry, graduate library studies, law, pharmacy, graduate nursing education, public health, architecture, maritime technology, and osteopathic medicine.

Lee Kerschner, Colorado's higher education executive officer, told the WICHE Commission in June that the WICHE exchange mechanism will play an increasingly important role as states seek to balance continued access to higher education against the fiscal limits that restrict resources for maintaining quality programs.

PSEP support fees, adopted by the commission in June, will increase an average of 3 percent for the 1983-84 academic year and an average of 6.7 percent over 1982 fees in 1984-85. Fees for ten of the sixteen fields in the program will not change in 1983-84, and four of the fields (dentistry, library studies, graduate nursing education, and public health) remain level through the 1984-85 academic year.

The 1982-83 fees range from \$2,700 for occupational therapy students to \$18,700 for medical students. In 1984-85, support fees will range from \$3,200 for forestry and architecture to \$21,000 for medicine.

"The support payments are negotiated fees for service based on the per-student cost of operating the programs, as well as other factors, such as the demand for the program, state budget conditions, and tuition increases," said William McConnell, director of the Student Exchange Program.

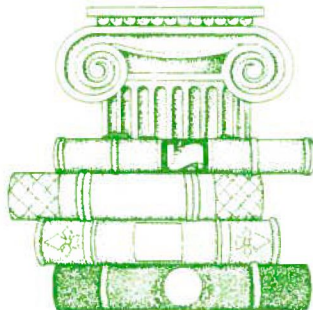
In recent months, WICHE has held discussions with several states that may be interested in participating in the Community College Student Exchange Program or in

other, targeted, reciprocal arrangements with neighboring states.

Idaho, Montana, and Wyoming currently participate in the community college exchange, which enables students to pay resident tuition at schools in neighboring states when certain criteria are met. The recent discussions have occurred in Arizona, California, Colorado, Nevada, New Mexico, Oregon, and Utah.

To assist states wishing to participate in such interstate arrangements, WICHE can provide models of enabling legislation that have been used successfully in other states.

Program Director: William McConnell,  
(303) 497-0210.



## Information Clearinghouse

Support provided by three organizations will permit WICHE to refine and update through the 1990s its earlier study projecting the number of high school graduates each year in each of the fifty states.

The Lilly Endowment, Inc., the College Board, and the Teachers Insurance and Annuity Association (TIAA) have contributed a total of \$40,000 to enable WICHE to complete and publish the updated study. The College Board and TIAA co-sponsor the report with WICHE.

The original study, published in 1979, has proved extremely useful in identifying the differing patterns of projected high school graduates among the states, in planning college and university enrollments, and in manpower and labor force analyses.

The 1979 study found that each of the fifty states and the District of Columbia will experience declines in the number of high school graduates to some point in the mid-1980s. After a brief upturn in the late 1980s, the number of graduates is projected to decrease further in the early 1990s in most states, although some states show a different pattern in the 1990s.

The new study, conducted by William McConnell, will extend the projections to the year 2000, include private schools where reliable information on their enrollments is available, and attempt to identify the changing ethnic mix of successive grade groups in each state.

The updated report will be available by fall 1983.

Widespread concern about the quality of the preparation of entering college students has prompted the Clearinghouse to undertake a study of state and institutional policies and practices for remedial education.

The study, conducted under the direction of Benjamin Bowser, will include profiles of remediation policies and practices in the western states and present an analysis of options for developing consistent state and institutional policies.

Some of the issues to be included are financing remedial programs, required versus optional remediation or skills improvement, and the relationship of remedial offerings to admissions requirements. A profile of the college-going population in each state will provide background for the policy discussion.

The report is scheduled for completion in early 1983.

The Clearinghouse currently is updating its report *Tuition and Fees in Public Higher Education in the West* to include 1982-83 charges. The new report (publication No. 2A115, \$4) will be available in November from WICHE's Publications Secretary.

Program Director: Norman Kaufman,  
(303) 497-0221.

## Graduate Education

A WICHE-coordinated demonstration project that makes specialized graduate programs available at reduced tuition may be expanded to include higher education institutions in twelve western states by fall 1984.

The project, called Regional Graduate Programs, currently encompasses forty-one master's and doctoral programs at seventeen graduate schools in Alaska, Idaho, Montana, Oregon, and Washington.

Through the project, students from the five states may enroll in the designated programs and pay resident tuition rates at public institutions (or substantially reduced tuition at private schools).



Work is currently underway to broaden the effort to include graduate programs in four additional states: Hawaii, New Mexico, Utah, and Wyoming. Discussions also are taking place at the statewide higher education board level in Arizona, Colorado, and Nevada.

With the authorization of the states' higher education governing or coordinating boards, WICHE will solicit nominations for programs from the graduate institutions wishing to participate. In addition, institutions and state higher education boards will be encouraged to make known programs in other states that they would like to have nominated.

The tentative schedule calls for preliminary nominations by Oct. 15, 1982, and final nominations by January 1983. A broad-based committee will select the new programs by June 1983 based on the program criteria and comments received during a regional review process. Students could enroll in the new programs in fall 1984.

The goals of the Regional Graduate Programs effort are to increase students' access to graduate programs at resident tuition rates; to increase the applicant pool for programs; and to enable states to assure access to high-quality programs while avoiding costly program duplication.

*Project Director: Richard Jonsen,  
(303) 497-0224.*

## Minority Education

Business, the health professions, and engineering were the graduate fields preferred by most students participating in a program designed to increase minority students' options for graduate education, according to recent data.

The information comes from a survey of students participating in 1981 in the Western Name Exchange, an association of twenty-six universities that circulates the names of minority students from those schools who are considering graduate school. Of the 1,810 students, 325 (18 percent) named business as the field they would like to study; 223 (12.3 percent) named the health professions; and 202 (11.2 percent) chose engineering.

Of those 1,810 students, 730 (40.3 percent) were Asian-American; 563 (31.1 percent) were Hispanic; 250 (13.8 percent) were black; 53 (2.9 percent) were Native Americans; and 32 (1.8 percent) were Pacific Islanders. The remaining 10 percent listed no ethnicity or an ethnicity not included in the exchange.

The participants included 876 men and 786 women; 148 students did not indicate their sex.

The undergraduate major most heavily represented was the social sciences (345 students, or 19.1 percent), followed by engineering (279 students, or 15.4 percent) and the biological sciences (215 students, or 11.9 percent).

Over 88 percent of the participants reported grade point averages between 2.5 and 4.0 (grades for C-plus to A); 52.6 percent reported averages above 3.0, which is a B.

"The data we collected in 1981 and in 1982 indicate that there are well qualified minority students in this program who want to attend graduate school," said Benjamin Bowser, director of WICHE's Minority Education Program, which administers the project. "Our next step will be to identify additional ways in which overall graduate minority recruitment can be improved. The Western Name Exchange is only one component."

The 1983 name exchange will begin soon; data for the 1982 effort will be available later in the fall.

*Project Director: Benjamin Bowser,  
(303) 497-0260.*

## Nursing Education

WICHE's Nursing Program is one of six organizations and colleges chosen by the W.K. Kellogg Foundation to participate in a \$6.5 million project to improve associate degree nursing education and service.

WICHE's grant is \$754,119 for a 27-month project to work with twenty-five western associate degree education programs and their clinical agencies in determining competencies needed by associate degree nurses and in developing ways to improve the preparation, utilization, and performance of these nurses.

Kellogg developed the project as a result of national task forces' recommendations for improving the quality of associate degree nursing education programs, which are the primary source of registered nurses beginning practice.

Over 200 participants attended the fifteenth annual Communicating Nursing Research Conference, held in Denver in May under the sponsorship of the Western Society on Research in Nursing (WSRN) of the Western Council on Higher Education for Nursing (WCHEN).

At the conference, WSRN presented the New Researcher Award to Letha Lierman of the University of Utah. Lierman was honored for her paper "Psychological Preparation and Supportive Care for Mastectomy Patients."

The proceedings of the conference, entitled "Nursing Science in Perspective," are available from WICHE (see New Titles).

In other Nursing Program activity, the project Changing Nurses' Participation in Health Planning will conduct a third and final series of workshops and state planning sessions this fall. The workshops, on "The New Era of Health Planning," will focus on current and future trends in health planning at the institution level and on increasing nurses' participation in the planning process.

The locations of the sessions are Honolulu, Hawaii, Sept. 21; Bellevue, Wash., Sept. 30 and Oct. 1; South Lake Tahoe, Calif., Oct. 4-5; and Santa Fe, N.M., Oct. 27-28.

*Program Director: Jeanne Kearns,  
(303) 497-0240.*

## Mental Health

WICHE's Mental Health Program is engaged in a one-year study of recruitment and retention of staff working with the chronically mentally ill. The project will identify the types of staff who serve this group in nine western states (Alaska, Arizona, Colorado, Hawaii, Idaho, Montana, New Mexico, Utah, and Washington) and determine staff recruitment and retention problems. The project is sponsored by the Community Support Program of the National Institute of Mental Health.

This fall WICHE will conduct the third of three subregional workshops on higher education clinical training programs for staff who work with the chronically mentally ill. Participants from federal region 8 will attend the conference, scheduled for Oct. 6-8 in Denver.

The Mental Health Program currently is working with western states to set an agenda for interstate activities for the coming year. Last year's activities included conferences on severely disturbed children, the mentally ill offender, and mental health services in energy-impacted areas.

*Program Director: Meredith Davis,  
(303) 497-0251.*



## Commission Holds Line on Dues and Fees



**Burgess**



**Nelson**



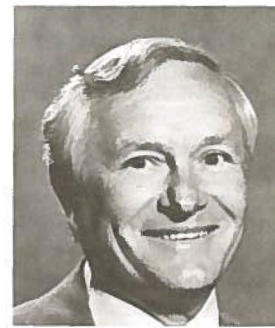
**Sturgulewski**



**Akama**



**Lieuallen**



**Perovich**

The WICHE Commission is responding to the financial difficulties of many western states by holding the line on dues and fees paid by the states to support students in professional studies and to participate in other WICHE programs.

The commission, at its June meeting, decided there would be no increase in state membership dues for 1983-84 and a 6 percent increase for 1984-85. The 1983-84 support fees for the Professional Student Exchange Program will remain level in ten of the sixteen fields and raise modestly for 1984-85. (For more details, see the report on the Student Exchange Program elsewhere in this issue.)

The commission approved the WICHE operating budget for fiscal 1983 and an updated long-range program and financial plan. The plan is "both a guide for WICHE's internal planning and a means of informing the states of WICHE directions in the near future," said Kerry Romesburg of Alaska, WICHE's chairman. Copies of the program and financial plan are available from the deputy director's office at WICHE.

Lee Kerschner, executive director of the Colorado Commission on Higher Education, was featured speaker at the June meeting. He discussed issues of student access, financial support for students, and methods of delivering education to consumers. Decisions concerning those issues

pose an opportunity for WICHE, governing boards, and others in higher education, he said.

The commission decided to hold its December 1983 meeting in Albuquerque and its June 1984 meeting in the Denver area. Its next meeting will be this December in Seattle.

Recent appointments to the thirty-nine member commission include two university presidents, a state senator, and a government employees' legislative representative. One commissioner was also reappointed to serve on the board, which directs WICHE's activities.

State Sen. Arliss Sturgulewski of Anchorage was selected by Gov. Jay Hammond to replace Glenn Hackney as a commissioner from Alaska. Sturgulewski has been active in WICHE's Graduate Education Project.

Arizona Gov. Bruce Babbitt named Arizona State University president Russell Nelson to the commission, replacing ASU professor Brent Brown.

Charles Akama of Honolulu, a legislative officer for the Hawaii Government Employees Association, was appointed to the commission by Gov. George Ariyoshi. Akama replaces State Sen. Patricia Saiki.

New Mexico Gov. Bruce King appointed John Perovich, interim president of the University of New Mexico, to fill the com-

mission vacancy created when William E. Davis resigned to become chancellor of the Oregon State System of Higher Education.

Philip Burgess, who has served on the commission since 1978, has been appointed to a second four-year term by Colorado Gov. Richard D. Lamm. Burgess is a professor of management and mineral policy and the director of the Energy and Mineral Institute at the Colorado School of Mines.

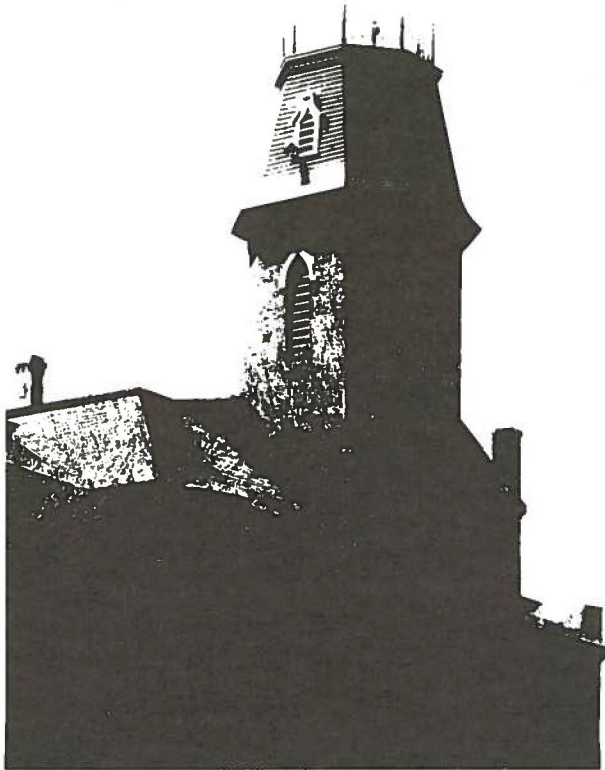
Another WICHE commissioner, Roy E. Lieuallen of Oregon, has been appointed a "senior adviser" to WICHE. Lieuallen, who has served as a commissioner since 1961, recently retired as chancellor of the Oregon State System of Higher Education.

As a senior adviser, Lieuallen will assist WICHE on special projects, particularly with the Regional Graduate Programs, which provide resident tuition rates to qualified students from Alaska, Idaho, Montana, Oregon, and Washington in over forty master's and doctoral programs in those participating states.

"He has had a leading role in conceiving of and launching the Regional Graduate Programs," said Phillip Sirotkin, WICHE's executive director. "WICHE will look to him for leadership and counsel as we seek to refine this important cost-saving program and expand it to other states in the West."



# Faculty Exchanges in the West: 1983-84



College and university faculty members willing to exchange teaching positions or to accept temporary assignments, as well as institutions seeking to fill short-term vacancies, are invited to participate in WICHE's Faculty Exchange service.

For the fourth year, WICHE's Information Clearinghouse will publish a list of faculty and institutions seeking or offering assignments for all or part of academic year 1983-84.

"The Faculty Exchange offers faculty members an opportunity to broaden their experience through contact with other experts in their fields, access to research facilities, and experience with different teaching structures and students. Institutions can use the exchange to fill temporary vacancies or offer specialized courses," said Phillip Sirotkin, WICHE's executive director.

Faculty interested in arranging exchanges or temporary assignments should outline the following in a letter to WICHE: Name, present institution, field of specialization, courses taught, geographical preference, type of institution preferred, and period of exchange (fall, spring, summer 1983-84).

Heads of departments wishing to have a faculty member from another institution on campus during all or part of 1983-84 should send information about the courses to be taught (including level) and the period in which the opening will occur. Application deadline is Oct. 15.

The listing will be available without charge in November to interested faculty and to institutions in the thirteen western states.

Submit applications to: WICHE's Information Clearinghouse, P.O. Drawer P, Boulder, CO 80302. For further information, contact the Clearinghouse at (303) 497-0221.

## New Program Directors at WICHE

New directors are heading WICHE's efforts in two program areas, minority education and nursing education.

Benjamin P. Bowser, most recently the assistant dean of the graduate school at Cornell University, in July assumed leadership of WICHE's Minority Education Program.

The program administers the Western Name Exchange, an association of twenty-six universities that circulates the names of ethnic minority students so those schools may recruit promising students for graduate school. Bowser helped to establish the National Name Exchange, the model for the Western Name Exchange.

Addressing plans for WICHE's Minority Education Program, Bowser said, "Beyond the name exchange, we want to design cost-effective projects to improve the recruitment and retention of minorities in higher education."

Bowser, whose academic training is in sociology, holds degrees from Franklin and Marshall College and Cornell. He succeeds Leonard Salazar at WICHE.



**Bowser**



**Kearns**

Jeanne M. Kearns, who has been on the WICHE staff since 1975, in June was named director of WICHE's Nursing Program and executive secretary of the Western Council on Higher Education for Nursing (WCHEN).

At WICHE, Kearns has served as associate director and acting director of the Nursing Program and is currently director of the WICHE/WCHEN project Changing Nurses' Participation in Health Planning.

The Nursing Program has maintained an active role for twenty-five years in improving nursing education, research, planning, and service in the western states.

Before coming to WICHE, Kearns taught in nursing programs and served as a consultant to the Division of Nursing in the federal Department of Health and Human Services. She holds degrees in nursing from Teachers College at Columbia University and the Catholic University of America. Kearns succeeds Sally E. Ruybal.



# New Titles

***A Casebook on Practice in Internship Education*** (No. 2A111, \$12). Intern program staff, faculty, agency sponsors, and others interested in experiential education will find this book a helpful resource for designing and operating internship programs.

It draws on information provided by twenty-three established programs to describe effective procedures for carrying out the tasks associated with operating internship programs, including developing and certifying sites, finding students and matching them to the job, and evaluating the learning experience.

Other sections of the *Casebook* describe and analyze the effectiveness of five administrative models of internship programs and present case studies of six different types of exemplary programs.

The *Casebook* can be used as instructional material in experiential education classes; a reference for operating programs; a guidebook for establishing an internship program; workshop material for faculty advisers, placement sponsors, and students; or background for research in experiential education.

This *Casebook* and an internship evaluation packet, to be published this fall, are the culmination of WICHE's Intern Program, which has been dissolved because of a lack of funds.

***Multicultural Education Sourcebook*** (No. 2A97, \$12). Because of continuing demand, this widely used resource for teachers and others involved in cross-cultural education was recently reprinted. The *Sourcebook* contains information and lesson plans on the countries and cultures of Cambodia, Laos, and Vietnam and innovative approaches to multicultural education. Several school districts in western states are already using the *Sourcebook* for curriculum development, classroom instruction, teacher in-service, and library reference. One school district official wrote: "The broad samples of cultural/linguistic/historical items included, as well as their specificity and detail, make this book useful to numerous special disciplines—global education, social studies, humanities, etc. A wonderful resource."

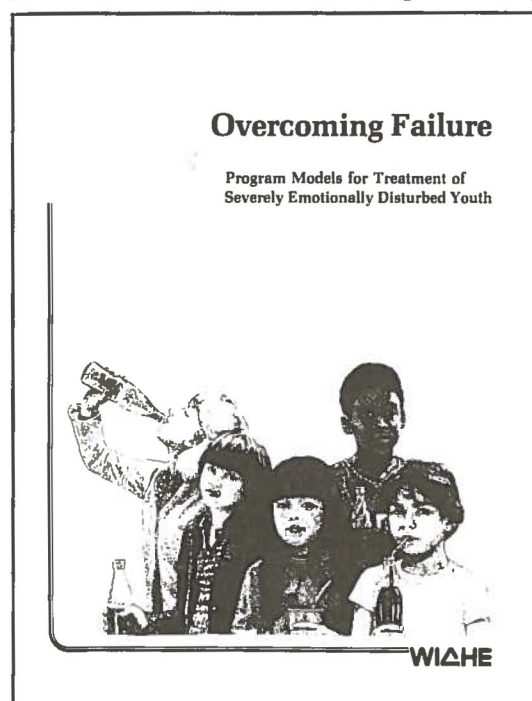
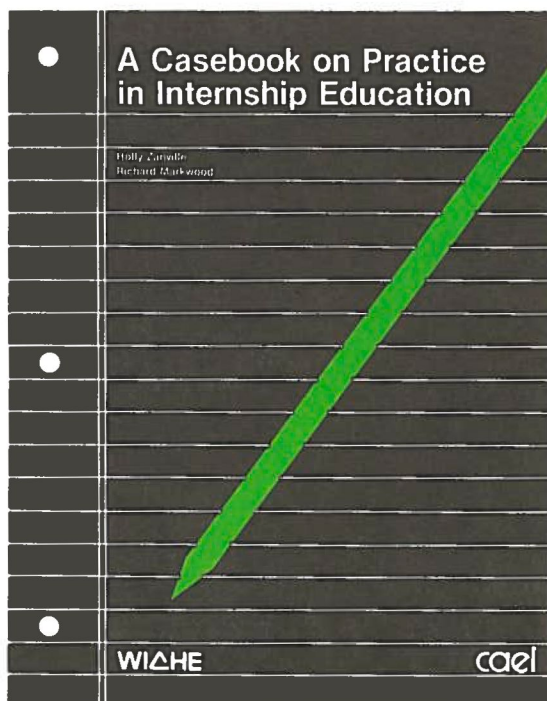
***Inventory of Education and Training Resources in Gerontology and Geriatrics at Western Colleges and Universities*** (No. 2A109, \$7). This volume reveals the wealth of opportunities available to westerners who want to learn about aging, whether they wish to pursue a degree program or continue their education informally. The *Inventory* provides an extensive list of gerontology offerings at over 200 higher education institutions in the West. It includes degrees offered; courses, both

credit and noncredit; faculty with expertise in gerontology and geriatrics; current research and training in the field; internships; and community and institutional resources in gerontology. Some educational opportunities for senior citizens are also included. The *Inventory* should be especially useful to practitioners in the field and college and university faculty who want information about recent or ongoing research on the topic.

***Overcoming Failure: Program Models for Treatment of Severely Emotionally Disturbed Youth*** (No. 3B21, \$7). Violent crimes committed by young people, high adolescent accident and suicide rates, and the incidence of chronically mentally ill youth drifting from one community to another have led many states to re-examine their services for youth with severe emotional and behavioral problems.

A conference convened by WICHE's Mental Health Program in Boise, Idaho, in late 1981 brought together state officials and mental health professionals to discuss a variety of approaches that have been effective in treating these young people.

This 187-page book contains papers presented at the conference and other material that puts the problem in perspective. It includes an overview of issues states face in serving emotionally





disturbed youth, with an emphasis on the value of interstate cooperation; characteristics of successful programs; descriptions of nine model residential and community-based treatment programs; and a table outlining state agencies' responsibilities for severely disturbed youth in the thirteen western states.

**Assessing the Mental Health of Children** (No. 2C126, \$7). Several recent national and state reports have documented the increasing prevalence of children who experience difficulty in coping with developmental, situational, and family stresses. This book is written primarily for nurses in schools, pediatric settings, community health, and mental health practice, who are in a good position to assist with early identification and referral of such children.

The book includes a model for assessment and diagnosis of mental health problems; tools, including drawings, for assessing problems of six- to nine-year-olds; interviewing techniques with nine- to twelve-year-olds; children's neurological problems, and family, cultural, and environmental factors.

The monograph is the result of two workshops on the topic conducted by the WICHE project Continuing Nursing Education to Improve Mental Health.

**Introduction to Health Planning** (No. 2C120, \$10). In the past two years, the WICHE Nursing Program project Changing Nurses' Participation in Health Planning, under a grant from the Division of Nursing, has conducted regional and subregional workshops and state planning sessions to help prepare nurses to participate more effectively in health planning activities. This report summarizes one series of four subregional workshops.

It contains sections on the current status of health planning in the West, federal legislation related to nursing education and health planning, the role of nurses in the legislative and health planning processes, nursing personnel planning methodologies, and data needed and available to support planning for nursing manpower.

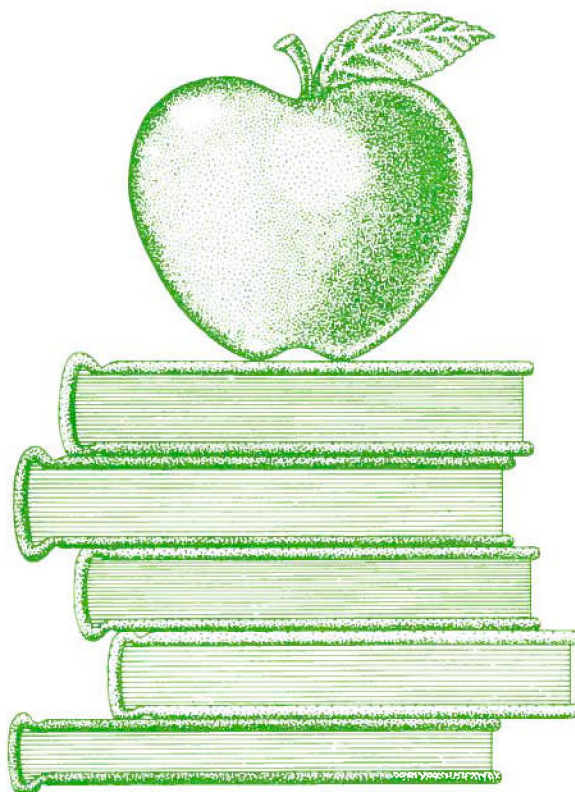
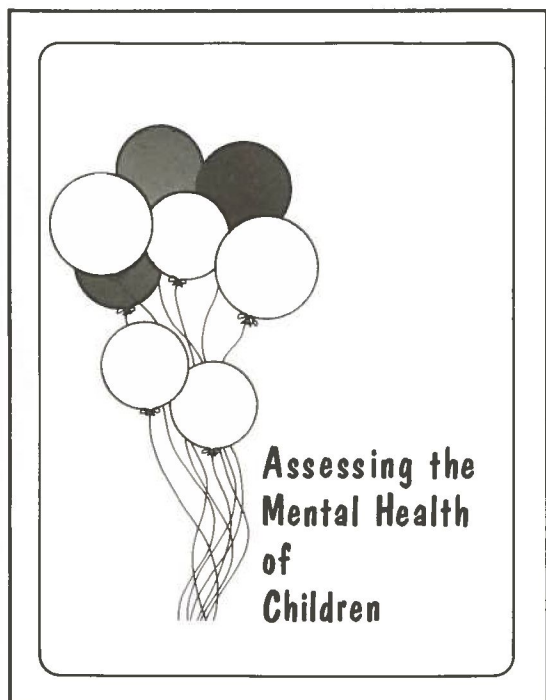
**Communicating Nursing Research: Nursing Science in Perspective, Vol. 15** (No. 2C125, \$12.50). This volume contains the highlights of the fifteenth annual conference on Communicating Nursing Research. It includes the keynote address, "The Research Cycle: Nursing,

the Science, the Discipline," by Kathryn Barnard of the University of Washington; the report "Preparation and Support for Mastectomy Patients," which earned the New Researcher Award for its author, Letha Lierman of the University of Utah; and summaries of other research and symposia.

**Slide Show: "This is WICHE"** A 130-slide presentation with accompanying audiocassette describes the efforts of the Western Interstate Commission for Higher Education in improving education in the West. The thirteen-minute show details how WICHE benefits students, colleges and universities, government, and industry through student exchanges, information sharing, and other activities.

Arrangements to borrow the "This is WICHE" slide-tape presentation may be made through WICHE's Communications Office, (303) 497-0273.

Publications may be ordered from the Publications Secretary, WICHE, P.O. Drawer P, Boulder, CO 80302, for the price indicated. A handling charge of \$1.00 will be added on orders that are not prepaid.





## Higher Education + Corporate America (continued from page 7)

will be developed; (4) industry's understanding of that body of knowledge may be increased; and (5) industry may gain a better understanding of how management and institutional practices constrain or enhance innovation processes.

For its part, the university gains at least four benefits: (1) support for the research enterprise on campus; (2) support for graduate students at the research stages of their careers; (3) opportunities for the employment of graduate students upon the completion of their degrees; and (4) participation in earnings resulting from commercialization or development of discoveries made at the university. Individual faculty members also benefit from participation in cooperative research arrangements in that they provide additional support for increasingly costly research, provide a potential for

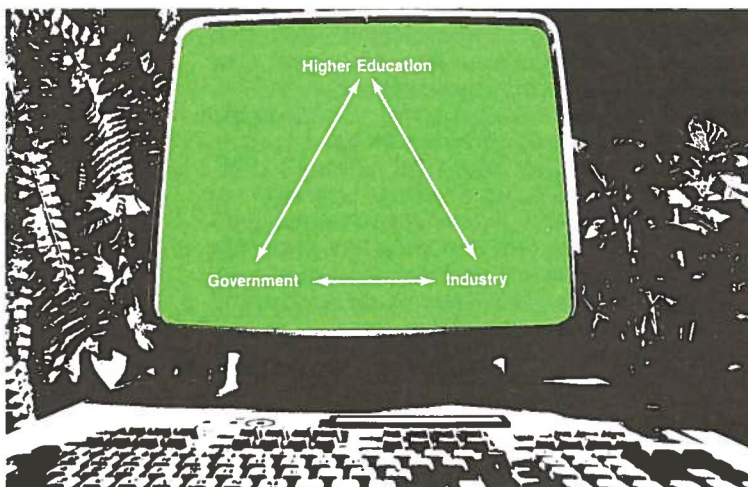
sharing in earnings of the industrial application of discoveries, and provide an avenue for further career development.

From the standpoint of the state, improved and closer working relationships between higher education and corporations in high technology provide perhaps the best single response to eroding revenue bases and economic stagnation being experienced throughout the country. As new technological discoveries are made and commercialized within the private sector, the economic vitality and fiscal health of the state can be significantly improved. The inducement for states to support and invest in joint university-corporate research undertakings is the clear potential for improving state revenues without the need to resort to major new taxing programs which, in the long term, may be counterproductive

to genuine economic growth.

State government, universities, and corporations must all be prepared to alter their organizational patterns and investment strategies in order to create an environment where the development of new high-technology innovations can proceed. In addition to providing additional tangible resources (i.e., in the form of direct funding, data sharing, and the like) there needs to be clearly defined organizational leadership and staff support to make these cooperative efforts function smoothly and effectively.

This article is adapted from a paper prepared for presentation by Dr. Monat to a panel discussion at the National Conference of State Legislatures on July 30, 1982.



### WICHE REPORTS

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Volume 27, Nos. 2 & 3,

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WICHE, the Western Interstate Commission for Higher Education, is a nonprofit regional organization. It helps the thirteen member states to work together to provide high-quality, cost-effective programs to meet the education and manpower needs of the West. Member states are Alaska, Arizona, California, Colorado, Hawaii, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, and Wyoming.

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