



Board of Regents of the University of Wisconsin System
Office of the Secretary
1860 Van Hise Hall
Madison, Wisconsin 53706
(608)262-2324

October 31, 2001

TO: Each Regent

FROM: Judith A. Temby

A handwritten signature in cursive script, appearing to read "J. A. Temby".

RE: Agendas and supporting documents for meetings of the Board and Committees to be held at Van Hise Hall, 1220 Linden Dr., Madison, on November 8 and 9, 2001 and at Grainger Hall, 925 University Ave., Madison, on November 8.

Thursday, November 8, 2001

10:30 a.m.-12 noon – Resources: Federal Funding Strategy
Quality: Learning Innovations Update
Quality: UW Systemwide Information Technology Plan
1820 Van Hise Hall
All Regents Invited

12:00 p.m.-1:00 a.m. – Development Program: Andrew Porter, Professor of
Education and Educational Psychology,
UW-Madison, speaking on: The Role of
Testing and High School Graduation Tests
1820 Van Hise Hall
All Regents Invited

1:00 p.m. – Education Committee
1920 Van Hise Hall

1:00 p.m. – Joint Committee meeting
Business and Finance Committee
Physical Planning and Funding Committee
1820 Van Hise Hall

2:00 p.m. – Business and Finance Committee reconvene
1820 Van Hise Hall

Physical Planning and Funding Committee reconvene
1511 Van Hise Hall

3:30 p.m. – Investment Forum
Business and Finance Committee and other Regents

Friday, November 9, 2001

9:00 a.m. – Board of Regents
1820 Van Hise Hall

Persons wishing to comment on specific agenda items may request permission to speak at Regent Committee meetings. Requests to speak at the full Board meeting are granted only on a selective basis. Requests to speak should be made in advance of the meeting and should be communicated to the Secretary of the Board at the above address.

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REVISED

BOARD OF REGENTS OF THE UNIVERSITY OF WISCONSIN SYSTEM

Thursday, November 8, 2001
10:30 a.m. – 12:00 noon
1820 Van Hise Hall
1220 Linden Drive
Madison, Wisconsin

1. Resources: Federal Funding Strategy
2. Quality: UW Systemwide Information Technology Plan
3. Quality: Learning Innovations Update

BOARD OF REGENTS OF THE UNIVERSITY OF WISCONSIN SYSTEM

Thursday, November 8, 2001
12:00p.m.- 1:00 p.m.
1820 Van Hise Hall
1220 Linden Drive
Madison, Wisconsin

Development Program

Presenter: Andrew Porter, Professor of Education and Educational Psychology, UW-Madison, speaking on: The Role of Testing and High School Graduation Tests

Participants: Regents, Chancellors, System President, Vice Chancellors, and President's Cabinet.

Interested persons are welcome to attend the program as observers.

Box lunches will be served. Luncheon reservations may be made by contacting the office of the Board of Regents by Monday, November 5th at (608) 262-2324 (phone) or (608) 262-5739 (fax).

BOARD OF REGENTS OF THE UNIVERSITY OF WISCONSIN SYSTEM

I. Items for consideration in Regent Committees

1. Education Committee - Thursday, November 8, 2001
1820 Van Hise Hall
University of Wisconsin-Madison
10:30 a.m.

10:30 a.m. All regents

- Resources: Federal Funding Strategy.
- Quality: Learning Innovations Update.
- Quality: UW Systemwide Information Technology Plan.

12:00 p.m.

Development Luncheon: The Role of Testing/High School Graduation Tests
Andrew Porter, Professor of Education
and Education Psychology, UW-Madison,
and Director, Wisconsin Center for Education Research

1:00 p.m. (or upon completion of previous session) Education Committee (adjourns to 1920)

- a. Approval of the minutes of the October 5, 2001 meeting of the Education Committee.
- b. Report of the Senior Vice President for Academic Affairs.
- c. Discussion.
 - (1) Resources: Federal Funding Strategy.
 - (2) Quality: Learning Innovations Update.
 - (3) Quality: UW Systemwide Information Technology Plan.
 - (4) The Role of Testing/High School Graduation Tests

(Over)

- d. Report on Industrial and Economic Development Research Fund, in accordance with s.36.25(25)(c), Wisc. Stats.
[Resolution I.1.d.]
- e. Additional items that may be presented to the Education Committee with its approval.

Closed session items:

- f. Closed session to consider personnel matters, as permitted by s. 19.85(1)(c), Wis. Stats. [Possible agenda items: Appointment of Wisconsin Distinguished Professors, UW-Milwaukee.]

EDUCATION COMMITTEE

Resolution I.1.d.:

That, upon recommendation of the President of the University of Wisconsin System, the report on projects undertaken in the UW System during fiscal years 1999-2000 and 2000-2001 and supported by the Industrial and Economic Development Funds be received and approved for transmittal to the Joint Committee on Finance, in accordance with s.36.25(25)(c), Wis. Stats.

**UNIVERSITY OF WISCONSIN SYSTEM
INDUSTRIAL AND ECONOMIC DEVELOPMENT RESEARCH REPORT**

EXECUTIVE SUMMARY

BACKGROUND

Section 36.25(25)(c) of the Wisconsin State Statutes requires the University of Wisconsin System to report biennially to the Joint Committee on Finance regarding the use, duration, and potential economic benefits of projects funded by Industrial and Economic Development Research Funds. This funding is distributed through the Applied Research Program, the Industrial and Economic Development Research Program and the Center for Dairy Profitability. 1987 Wisconsin Act 27 created the Industrial and Economic Development Research Fund. The fund is intended to promote technology transfer and/or collaborative projects that have the potential to stimulate economic development in Wisconsin.

REQUESTED ACTION

Approval of resolution I.1.d., accepting the report for transmittal to Joint Committee on Finance.

DISCUSSION AND RECOMMENDATIONS

Information was collected on each new project within the UW System that was supported with Industrial and Economic Development Research Funds during the 1999-2000 and 2000-01 fiscal years. During the 2000-01 fiscal year \$431,358 was administered system wide through the Applied Research Grants Program and \$633,033 through the Industrial and Economic Development Research Program. \$311,406 was allocated to the Center for Dairy Profitability.

The Applied Research Program and Industrial & Economic Development Research projects are described separately within the report. These projects have resulted in numerous collaborative activities with Wisconsin industries and significant economic benefits for the Wisconsin economy. Project specific summaries are included in appendices, and complete project reports are available from the UW System Office of Academic Affairs, upon request.

The Center for Dairy Profitability uses multi-disciplinary and interdisciplinary resources to develop and deliver high quality educational programs designed to integrate dairy production, financing and marketing into management systems. The goal of these efforts is to improve profitability within this \$16 billion industry that is the largest source of agricultural income in Wisconsin.

RELATED REGENT POLICIES

There are no related Regent policies. Section 36.25(25) (c), Wis. Stats., requires biennial submission of this report.

Industrial and Economic Development Research Fund 1999-2001 Biennial Report

The Industrial and Economic Development Research Fund was established to enhance the relationship between research at UW System institutions and Wisconsin industry practices in an effort to promote growth in the state's economy.

The following report is divided into three sections. The first concerns the Center for Dairy Profitability, an on-going UW-Extension and UW-Madison project that addresses the challenges presented to the Wisconsin dairy industry by the Wisconsin economy. The second section details the Industrial and Economic Development Research Program administered by the University-Industry Relations office (UIR) at the UW-Madison. The final section provides an overview of Applied Research Program projects, which are administered by the UW System Office of Academic Affairs.

For the latter two programs, grants are awarded on a competitive basis. Proposals are encouraged that are technically innovative, of interest to a broad economic sector, and have high potential to benefit Wisconsin's industrial and economic development in the near term. Grant summaries are provided in the appropriate sections.

The projects arising from the Industrial and Economic Development Research Fund have served a large number of Wisconsin businesses and industries in various fields. In the long run, many of these funded projects are expected to improve the competitive position of Wisconsin firms.

A. Center for Dairy Profitability (UW-Extension/UW-Madison)

Milk sales are the primary source of agricultural income in Wisconsin, accounting for almost 52 percent of the \$5.2 billion of total income generated by farms in the state in 2000. The value of the state's total milk production was \$2.7 billion in 2000, down from a value of \$3.2 billion in 1999. It is estimated this milk production supports a total dairy industry that contributes nearly \$10 billion to the Wisconsin economy.

The University of Wisconsin Center for Dairy Profitability (CDP or Center) is a multi-campus extension unit with faculty and staff at UW-Madison, UW-Extension, UW-Platteville, and UW-River Falls. A total of \$311,406 from the Industrial and Economic Development Research Funds was allocated to the Center for salaries and other expenses in fiscal year 2001. Approximately 90 percent of these funds was used to cover salaries and benefits. A total of 3.30 FTEs in the Center are funded with dollars coming from the Industrial and Economic Development Research Fund. These FTEs are allocated to campuses as follows: 2.10 at Madison; .51 at Extension; .29 at Platteville; and .40 at River Falls. The remaining 10 percent of the funds was committed to supplies, LTE and student hourly help.

The CDP develops, coordinates, and delivers interdisciplinary educational programs and emphasizes integrated production, financing, and marketing management systems to foster improved dairy profitability. The CDP's over-riding goal is to improve the profitability and competitiveness of Wisconsin's dairy industry.

The economic success of Wisconsin's dairy industry hinges largely on the knowledge and management skills of the farm managers and agribusiness professionals. They are making decisions that will determine whether the state's dairy industry is competitive and prosperous over time. Informed management decisions are key to dairy's long-run economic success; therefore, the CDP's emphasis is on educational programs that enhance the management skills and decision-making abilities of dairy producers and others who assist producers in management decisions.

This report details the programs of the CDP and briefly describes some of the key accomplishments of these educational program efforts. It also contains examples of how the CDP is attempting to facilitate the development of multi-disciplinary educational programs and partner with other institutions that share its goal of enhancing the profitability of the dairy industry both in Wisconsin and other states and nations.

MANAGEMENT EDUCATION PROGRAMS

The CDP is involved in a variety of management education programs that are intended to make farm managers and agribusiness professionals knowledgeable of the management practices that can be used to improve the performance and profitability of farm businesses. The following is a brief discussion of some of these programs.

AGVENTURES

AgVentures is a fee-based management education program that is intended to help farm managers improve their prospects for success. Through this program, farm managers can become knowledgeable about management concepts and learn how to apply this knowledge to the problems they face when operating their farm businesses.

AgVentures has been designed to give farm managers ample opportunities to become very familiar with a number of management topics. Managers going through this program can select from modules that address various topics. Each module has 15 hours of instruction over three weeks with five hours of instruction in a given day.

In addition to adding two modules, (Risk Management and Grain Marketing) most of the topics previously addressed by *AgVentures* were updated and placed on Compact Disc during the last 2 years. The updated topics are: Strategic Planning; Financial Management and Analysis; Human Resource Management; and Business Arrangements and Farm Transfers.

A total of eleven *AgVentures* workshops were conducted in 1999 and 8 in 2000 by county agents across the state. The total enrollment for these nineteen workshops was 116 people.

County agents are taking ownership in this program and encouraging their colleagues to engage in this programming activity. As a result, more producers should be able to participate in *AgVentures* programs in the coming years.

BABCOCK INSTITUTE

The Babcock Institute for International Dairy Research and Development at the University of Wisconsin offers programs to foreign nationals, both in the United States and in other countries. Gary Frank has been an instructor in Institute courses for several years and has written several papers that have been translated into other languages.

DAIRY HEALTH MANAGEMENT CERTIFICATE PROGRAM

CDP faculty and staff have served as instructors in this management education program that the Veterinary School of UW-Madison offers to Doctors of Veterinary Medicine who want to become more knowledgeable about dairy farm management. This work has helped the Center build ties with veterinarians who are currently servicing dairy farmers and are likely to direct producers to the Center for help or assistance.

Gary Frank and Bruce Jones of the CDP have handled most of the financial management instruction for this program. Specific topics covered by CDP staff include: financial statements; accounting principles; financial analysis; budgeting; and investment analysis

DISCOVERY AND STEWARDSHIP FARMS

Arlin Brannstrom worked with Dennis Frame on the selection and procurement of computer equipment for the Discover Farms staff and on the registration of the Discoveryfarms.org web domain. They hope to incorporate some of the digital video and streaming audio techniques now being tested and used through the School for Beginning Dairy Farmers.

Gary Frank worked with Kevin Bernhardt and Phil Wyse to set up the chart of accounts for the Platteville Stewardship Farm. It will use the Agricultural Accounting and Information Management System (AAIMS) as its accounting system.

RISK MANAGEMENT

Kevin Bernhardt has delivered several train the trainer risk management workshops in Wisconsin and in July 2001, did one with the Minnesota Technical College System. The risk team is working on two major curricula. One is a grains price risk management package with the Grain Team. The other is an update to Farm Business Management and Transfer package.

The risk management work is part of a national risk management initiative funded by the USDA. Kevin Bernhardt of the CDP and UW-Platteville headed up this project with Bob Cropp of the UW Center for Cooperatives. A comprehensive risk management manual was produced as a part of this project. The target audience for this program was farm managers, but county extension agents and agricultural professionals have also participated in the training.

SCHOOL FOR BEGINNING DAIRY FARMERS

The School for Beginning Dairy Farmers distance education pilot was conducted for a second year during the 2000/01 school year. We linked approximately 12 remote students to our live classes via synchronous streaming Internet voice. The software used in the pilot is called Learning BIAS from a company called Net BIAS in St Louis, MO. All remote sites were charged a \$300 fee and all fees were collected. Continuation of the pilot was made possible by a small Multi-Agency Land and Water Education Grant.

Evaluations from both students in the classroom and remote participants have been very good. Since the conclusion of the 2000/2001 series we have been working to remodel the SBDF course website and develop a client server voice streaming application to supplement the Net BIAS software. We anticipate

beta testing for this new software this fall.

In addition to the SBDF streaming audio experience, CDP was active in producing compressed video CD's of Dr. Randy Fortenbery's Grain Marketing Short Course, a 30-minute lecture on financial stress and suicide prevention by Dr. Roger Williams. We are currently working to develop a CD featuring interviews with Wisconsin dairy producers who have recently retrofitted low costs parlors into existing facilities. This project is being done in conjunction with Dave Kammel, Vance Haugen, Jim Leverich, Mark Mayer, Paul Dietmann and Tim Rebein. The CD is slated for distribution at the October All Faculty Conference.

OUTFITTING THE TOOL KIT FOR THE YEAR 2001

Over two hundred persons from various agencies and organizations attended one of the one-day workshops held December 12, 14 and 19, 2000, in Madison, Chippewa Falls and Green Bay, respectively. The program included presentations that characterized the farm economic situation for Wisconsin farm commodities, indicators of farm stress, sources of assistance to which producers could be referred, legal issues related to bankruptcy, and other important topics including educational alternatives and counseling. Following the very well received event, a Compact Disc was produced and distributed to all participants and all county agricultural educators. The CD was intended to be both a portable resource for use by agricultural professionals and an education aid for group instruction on the subjects covered in the workshop.

Leadership for designing and conducting the workshop was provided by a team of individuals from the Center for Dairy Profitability (CDP), the Wisconsin Technical College System, the Cooperative Extension Self-Directed Farm Management Education Team, Farm Credit Services, Farm Service Agency and others.

The cost of the workshops, aside from the in-kind contributions of time provided by all who planned and presented at the workshops (only one presenter charged a fee), was covered by the \$35 fee charged to participants. The Wisconsin Technical College System handled non-University personnel registrations. The Center for Dairy Profitability handled and subsidized University-related registration to encourage participation of county educators.

Evaluation summaries received from the workshop participants in each location provided evidence that the workshop had exceeded the planning committee's expectations. Also, there was broad support for future activities of this kind.

ECONOMICS OF DAIRY

FARM FINANCIAL MANAGEMENT PROJECT

The CDP is working with the Lake Shore and Fox Valley farm management associations on a farm records project that is intended to increase our knowledge of the economic and financial operations of dairy farm businesses. The records data gathered by the farm management associations are used to compute costs of production of dairy farms and selected financial measures like rates of return on assets, rates of return on equity, debt to asset, etc. These performance measures are widely used by county agents, lenders, policy-makers, and agribusiness professionals who work with producers on economics related problems and are available in hard-copy or accessible from the Center's web page.

For roughly seven years, Gary Frank and Jenny Vanderlin have been analyzing the records of dairy producers and assessing the costs of production and financial performance of a select group of dairy farms in Wisconsin. These analyses, which are on the CDP web-site, are used extensively in dairy extension programs that are intended to help dairy farm managers become better managers and more profitable. The most recent analyses of dairy farm records show that Wisconsin dairy producers had a poor year in 2000. The low rate of return on assets is evidence that Wisconsin dairy producers had a below average financial year in 2000.

AGRICULTURAL FINANCIAL ANALYSIS (AgFA)

In 1999 work was initiated, under the direction of Gary Frank, on a computerized financial analysis system that dairy producers and others can use to summarize and analyze the annual financial performance of farm businesses. This financial summary package will let "farm advisors" or individual farmers compile their annual financial reports and put their records into a standardized format that is compatible with the records of other farm managers.

AgFA is currently being used by the Lake Shore and Fox Valley farm management associations, several Wisconsin Technical College System and county educators. It is an integral part of the Farm Financial Management Project and was designed so that it could assume that task.

It has been and is now collecting financial records for the 2000 financial year. As of August 2001, we have over 700 year 2000 dairy farms' financial records on AgFA and are receiving additional records continuously. We recently acquired a Dell 2450 Power Edge dedicated server to host a total of nearly 5000 record years (1996 – 2000) of Wisconsin dairy financial records. Jenny Vanderlin has been responsible for the conversion of previous years data from several sources to AgFA. Workshops have been held at several sites around Wisconsin to train extension agents, bankers, WTCS instructors, and farm management association field personnel to use this new system.

The standardized financial records are being used to create benchmark information that can be used to monitor and evaluate the financial performance of Wisconsin farms (all types of farms, not just dairy farms, can be entered into the system). This work is yielding much information about the financial status of Wisconsin farms and giving farm managers and their advisors some economic and financial benchmarks that they can then use to see how their farm business compares to others.

REGIONAL/MULTI-STATE INTERPRETATION OF SMALL FARM FINANCIAL DATA

USDA IFAFS Grant Agreement #00-52101-9708 This three-year grant for \$257,000 was received in October 2000, largely because of the efforts of Tom Kriegl and the CDP's ownership and development of AgFA. Approximately half of these funds will be shared with the participating states.

Many Livestock Enterprises and Sustainable Livestock Farming Systems are too few in number in the existing economic data sets to provide a critical mass of data needed to help small and medium sized farms to understand the possibilities that other systems may offer them.

Land Grant Universities from Illinois, Indiana, Iowa, Michigan, Minnesota, New York, Ohio, Pennsylvania and Wisconsin plus Ontario are using common accounting rules and the Internet based farm financial analysis computer program (AgFA), developed at the University of Wisconsin Center for Dairy

Profitability to provide instantaneous updating of group data for this kind of use. Also, some data may be obtained from a few additional states on a more limited arrangement.

This regional/multi-state project is building on existing efforts and began with 1999 data from management intensive rotationally grazing dairy farms in several states. It has been the intent to collect 2000 data from organic dairy farms, custom heifer raisers and beef grazing. However, the project has been slowed down because the grant money due to the subcontracting states was not released until August 2001.

This project incorporates the grazing study that has been in progress for five years at the CDP under the direction of Tom Kriegl. The grazing project was intended to enlighten farm managers, their advisors, and other interested parties on the costs and returns of Wisconsin producers who utilize various grazing practices on their dairy farms

MANAGEMENT INFORMATION SYSTEMS

AGRICULTURAL ACCOUNTING AND INFORMATION MANAGEMENT SYSTEM (AAIMS)

The Agricultural Accounting and Information Management System (AAIMS) is a computerized agricultural accounting system maintained by members of the CDP. The program now has both DOS and Windows versions. Since its latest release in January of 2001, several hundred copies of the program have been sold to farm managers, with the majority being managers who are updating earlier versions of the program.

AGRICULTURAL BUDGET CALCULATION SOFTWARE

The CDP maintains a computerized system database that is used to estimate the cost of producing various crops under various systems. This budget generator, known as the Agricultural Budget Calculation Software is used in evaluating the economics of various crop-related problems. Both the Grains and Forage extension teams produce enterprise budgets using ABCS that are placed on the web (cdp.wisc.edu).

DAIRY PRO-FORMA

This computerized spreadsheet, developed by Gary Frank, is used to estimate the potential costs and returns for any dairy system a producer may be planning to use. County extension agents and financial consultants are using the spreadsheet to help dairy farm managers put together the financial plans for modernization and/or expansion. This decision-aid and instructions, is available on the CDP web site, complements the financial planning work that is being funded by the Wisconsin Department of Commerce.

FARMSTEAD MILK PROCESSING

Making and selling dairy products is not for everyone. Therefore, Gary Frank developed a decision making tool to help answer questions about the economics of farmstead milk processing. This spreadsheet and instructions can be downloaded from the CDP's website at: www.cdp.wisc.edu. It is under the heading "Decision Making Tools."

The spreadsheet and a paper were presented in April 2000, at the Farmstead Milk Processing conference in Frederick, MD. The conference was a joint product of the University of Maryland/Maryland Cooperative Extension and the Maryland Department of Agriculture.

COOPERATION WITH AGSOURCE

Bruce Jones is engaged in a project that is intended to make production data, compiled by AgSource/Dairy Herd Improvement, more usable by dairy producers. This year some pro-type reports were generated which allowed a producer to see how a particular production variable) i.e. milk production, % protein, % fat, culling rate, etc.) has varied over a twelve-month period and compares to an average for a group of high performance producers. These reports will be shared with a test group of producers this year and then provided to all interested producers in future years.

OTHER DECISION MAKING AIDS

The CDP has developed a variety of computerized spreadsheets that may be used in making various management decisions. Enterprise budgets are available for dairy, replacement dairy stock, swine, and beef. Other spreadsheets are available for determining the value of silage, corn, and other feeds. The spreadsheets mentioned above and a host of others are frequently developed as producers and others who work with producers need assistance in making management decisions.

HOME PAGE (www.cdp.wisc.edu)

The Center for Dairy Profitability's home page has existed since 1995. During the last two years a major overhaul to the site was made not only in terms of software and design but also in location. Once located on the campus server it is now located on the CDP server for better maintenance. The new design of the homepage was developed for easy access and retrieval. In the near future it will also be updated for web accessibility.

The Center for Dairy Profitability site has a wealth of information that is of value to dairy producers and professionals who advise dairy producers. The number of people visiting the site, downloading information, obtaining benchmark information, etc. increases substantially each day.

POLICY WORK

The faculty and the staff of the CDP have been involved in two policy issues that affect the potential profitability of Wisconsin dairy farms. One of these issues is the new use-value assessment system that Wisconsin has adopted for levying property taxes on farmland. The other is Wisconsin's law that limits the price premiums that milk plants can pay to producers on the basis of the volume of milk shipments.

USE-VALUE ASSESSMENTS

Bruce Jones serves on the Farm Land Advisory Council and has taken the lead in developing some

procedures for computing use-value assessments across the state. This work was in response to some complaints by farmers in the northern region of the state that the income measures used to compute their use-value assessments were above the norm for their region. Jones reviewed these claims, found them to be true, and then developed a procedure for accounting for the lower rents that are typically earned on farmland in the northern and central regions of the state. These new procedures for computing use-values were adopted by the Farm Land Advisory Council for use in 1999.

VOLUME PREMIUMS

Gary Frank of the CDP served as one of the state's expert witnesses in the lawsuit that challenged the "volume premium" law that is supposed to prevent price discrimination from occurring in the Wisconsin. Frank's role in this lawsuit was to provide the court information about milk hauling costs so that it could be determined if there was any economic justification in the premiums that were being paid to producers who were shipping large volumes of milk to various plants.

OTHER PROGRAMMING ACTIVITIES

DAIRY 2020

Bruce Jones has worked with the Dairy 2020 Council on various dairy management issues. In the past he and David Williams, a county agent from Waukesha, developed a pamphlet that gave some guidelines for selecting agricultural consultants. This pamphlet was pulled together at the request of the Dairy 2020 Council because the Department of Commerce wanted to give dairy producers something that would give producers some guidance in hiring and working with consultants who would be putting together expansion and modernization plans for the producers.

EXTENSION TEAMS

This past year the Agriculture and National Resource program area of the University of Wisconsin Cooperative Extension reorganized into a set of teams that will be responsible for specific programming activities. Two of these teams, the Dairy Team and the Business Management Team, have been lead by faculty and staff of the CDP. Bruce Jones headed up the Dairy Team and the Management Education Team was co- led by Gary Frank and Jenny Vanderlin.

The Dairy Team is responsible for coordinating all dairy extension programs for Wisconsin. This team has selected three programming priorities for the short-term. They are: dairy modernization; cow care and herd health; and dairy business management.

The dairy modernization effort is intended to help dairy producers get access to the information they need to decide regarding options they have for modernizing or expanding their dairy operations. This work is on going and involves a number of issues such as: farmstead planning; costs of parlor systems; costs of animal housing; manure storage and management; financial planning; and business arrangements. Efforts are now underway to organize and compile this type of information so that it can be distributed to interested individuals.

Work on dairy business management will be done in conjunction with the Business Management Team. This work will be done to improve the business management skills of dairy producers. Topics such as financial analysis, marketing, personnel management, and strategic planning are some of the things that will be addressed by people working on dairy business management.

MISCELLANEOUS

Teaching Award

Decision Making in a Market Economy, Farm Record Keeping, and Measuring Farm Profitability were again taught by CDP staff. Gary Frank and Arlin Brannstrom were recognized for their innovative teaching techniques in short course farm management with John R. Donald teaching awards at a recent College awards banquet.

Wisconsin Chapter of the American Society of Farm Managers and Rural Appraisers

Arlin Brannstrom continues to serve as the Secretary / Treasurer of the Wisconsin Chapter of the American Society of Farm Managers and Rural Appraisers. In that capacity he organized a two-day conference on Conservation Easement last October. The conference was highly successful with 82 paid attendees from as far away as Colorado and Pennsylvania. In February he planned and conducted a one-day seminar for Wisconsin Agricultural Consultants. WAPAC, WC/ASFMRA, CDP and the Dairy 2020 Council cosponsored the event. More than 40 consultants attended the workshop. A follow-up workshop is being planned for this February.

B. Industrial & Economic Development Research (I&EDR) Program (UIR)

The office of University-Industry Relations (UIR) is responsible for administering the Industrial and Economic Development Research (I&EDR) grant program for the University of Wisconsin-Madison. During the grant competition for fiscal year 1999-2000, UIR received 57 proposals requesting \$2,179,359, and 31 projects totaling \$680,193 were funded from I&EDR. During the grant competition for fiscal year 2000-2001, UIR received 57 proposals requesting \$1,869,822, and 28 projects totaling \$633,033 were funded from I&EDR. Four projects received funding in both fiscal years 1999-2000 and 2000-2001. A table that identifies the principal investigator, project title, university department, and amount of the award for each project is provided.

1. Use of Human NIKS Cells to Assay for Effects of Topical Agents on Cutaneous Barrier Function

The goal of the project was to determine if environmental agents that come in contact with human skin could be monitored by a novel human keratinocyte cell line, NIKS cells. The NIKS cells can produce a three dimensional human skin equivalent. Our goal was to investigate if the NIKS cells would respond to known human skin irritants or agents that produce dermatopathologies in the human population. We studied the effects of TCDD (dioxin) on normal human keratinocytes and the NIKS cell line. TCDD is a prototypic environmental pollutant that is known to produce a dermatopathology in humans and is an environmental pollutant of Lake Michigan and the Fox River Valley area of Wisconsin.

We found that the NIKS cells behave identically to normal human keratinocytes and are very responsive to TCDD causing accelerated differentiation in organotypic culture. This response is similar to what is seen in the human population, demonstrating that the NIKS cells are an excellent model to screen for environmental pollutants that affect human health. We also conducted DNA array analysis, but could not really get this developed on the budget of this grant. There is significant intellectual property to be mined from this initial DNA array data.

A spin off company from the University of Wisconsin, Stratatech Corporation, has been established based on the NIKS cell technology.

2. A Transgenic Treatment for Fatty Liver in Dairy Cows

Lactating ruminants, including dairy cows, are susceptible to fatty liver, a condition caused by their relative inability to secrete triglyceride from the liver. The accumulation is associated with a number of health problems in these animals and a subsequent decrease in milk production. Our goal was to determine if expression of apolipoprotein E in ruminant liver would help alleviate fatty liver.

In miniature goats as a model system, we performed experiments to induce and determine baseline values for fatty liver, and we cloned and determined the DNA sequence for the gene encoding goat apolipoprotein E. Despite repeated attempts to deliver a reporter gene directly to the liver we could not detect expression of the transgene. We are in the process of testing our hypothesis by transfection of the apolipoprotein E transgene in isolated bovine liver cells.

Alleviation of fatty liver would greatly enhance milk production of dairy herds statewide. Although a gene therapy for dairy cows is not practical, creation of a transgenic cow that is resistant to fatty liver promises to be a financial benefit for the dairy industry. Gala Design, a Sauk City company, intends to develop this transgenic animal.

3. Assays for Angiogenesis

Angiogenesis, the development of new blood vessels, is a critical step in cancer development as

well as in a number of other diseases ranging from diabetic retinopathy to atherosclerosis. Successful study of angiogenesis requires good methods for assessing efficacy of anti-angiogenic agents that might be developed for therapy. The project was designed to develop improved methods for assessing angiogenesis and its inhibition by test drugs or antibodies.

We developed two new assays, the Matrigel/sponge assay and the chick aortic arch assay. These assays provide a means of determining whether test reagents placed in a sponge in culture or systemically can influence the new blood vessel formation induced by either tumor cells or other angiogenic factors. The development of the assays did not achieve the desired results. Specifically, the Matrigel-like material proved to have too low a protein concentration to be useful.

Promega provided reagents for this research project and markets the Matrigel-like material. Promega is a biotechnology company located in Madison, Wisconsin.

4. Universal Man-Machine Interface via the Tongue

Our laboratory is developing a system as a vision prosthesis to be used in environmental and object recognition training for blind children. The research objectives of this project were to develop a video camera interface for electrotactile display of visual information on the tongue and to use the results of these preliminary studies to pursue federal funding for subsequent R&D. We also sought to identify potential applications of the technology by developing an initial marketing and commercialization study. The results could be used in the future to attract venture capital that would facilitate transition of the technology from the lab to commercial marketplace, and identify commercial partners for the manufacture and distribution of the device.

We developed an electrotactile imaging system that uses a miniature video camera that connects to the electrotactile tongue display system we developed earlier. The system and software offers a near-real time display of the visual environment. It can be electronically zoomed, allowing inspection of object details, or moved to wide-angle to allow the user to obtain general information about the visual environment. Additionally, we identified a new method of mounting the tongue array in the mouth, particularly for experimental research and prototype testing. It involves using a curable silastic compound that can be custom molded to each subject's upper palate. The process is fairly simple, and the reusable 'retainer' may then be easily modified, offering a more efficient means of reliably testing the array and system.

Our project that UIR funded eventually led to NIH-SBIR grant for a small, high-tech spin-off company, Wicab, Inc., Madison, Wisconsin.

5. Microfluidic Systems for Improved DNA Transfection/Infection Processes

The main goal was to apply/develop microfluidic system technology to optimize and improve methods for gene expression in eukaryotic cells in partnership with PanVera Corporation. The specific applications for PanVera were to increase throughput, save time, and increase the efficiency of gene expression. The technologies developed for PanVera would also be applicable to other Wisconsin biotechnology companies, giving them an advantage over competitive biotech companies in other areas (San Francisco, Boston).

The results of the project were knowledge and devices capable of overcoming problems not yet conceived of by most other biotech/microfluidic companies. Several applications were developed: a very effective evaporation prevention method for microfluidic devices; a novel pumping method which will allow microfluidic devices to interface with current high throughput infrastructure; and a very efficient way to simultaneously test hundreds of concentrations of chemicals on cells. All of these results will help

PanVera, and other Wisconsin biotech companies, save time and money during their development cycle. On the basic research front, experiments performed under this funding uncovered a result that may have very significant implications within cell biology.

The results from the project have the potential to greatly increase the efficiency, productivity, and profitability of biotechnology companies in Wisconsin.

6. Improved Casting Simulation Software for Foundry Industry

Wisconsin foundries and related metal industries need simulation models to reduce product development time and to improve product quality. The original objective of this project was to develop a microscopic simulation model for the casting of multi-component alloys. We subsequently learned through CompuTherm, LLC that the probability of getting SBIR funding on thermodynamic databases for aluminum, nickel and titanium was much better. With the consent of UIR, we switched our effort to develop thermodynamic databases for core alloy systems of aluminum, nickel, and titanium.

On the basis of our results, CompuTherm, LLC did apply and won a Phase I project from the USAF. We learned very recently that they also won a Phase II SBIR project from the USAF to develop thermodynamic databases for commercial aluminum, nickel, and titanium alloys.

These databases, when available, will be used by a variety of materials industry in the state. Since we do not have the capability to develop robust and user-friendly software for end-users in industry, we planned to transfer this technology to CompuTherm, LLC, a computer software company in Madison, so that they can use our results to obtain a SBIR funding to develop the software.

7. Immuno-assay analysis of lead in soil

The objective of this project was to evaluate the potential of a simple, inexpensive, on-site 'quick' test based on immunoassay technology that could specifically and precisely measure the concentration of soil lead and substitute for traditional laboratory analysis.

Strong correlation between the novel immunoassay technique and traditional laboratory strong acid extraction/digestion and atomic spectroscopy was found for 138 soil samples collected from Wisconsin and nationwide. Soils have very complex matrices from the presence of other metals and organic compounds that can interfere and complicate analysis. However, little to no effect on the performance of the immunoassay technique occurred when soils having widely differing characteristics (pH, texture, organic matter content, nutrient status and metal concentration) were analyzed.

Commercialization of the immunoassay technology will be pursued by Biometalix, Inc., a biotechnology company incorporated in Wisconsin in May, 1998. The company expects to create four full-time salaried positions in Wisconsin over the next three years and projects a payroll of \$280,000 by the year 2004.

8. DNA Vaccination Against Bacterial Pneumonia in Cattle

The long-term goal of this research is to devise a DNA vaccine that will protect cattle against bacterial pneumonia caused by *Pasteurella haemolytica*. The hypothesis tested in this proposal was that DNA encoding the *P. haemolytica* leukotoxin gene could be used as a vaccine to elicit an anti-leukotoxin antibody response *in vivo*. The specific aims of this project were: 1) Develop a DNA plasmid containing the leukotoxin determine whether it is expressed by bovine and murine cells *in vitro*; and 2) Compare the anti-leukotoxin antibody response in mice immunized with leukotoxin DNA.

We succeeded in making a DNA construct that encodes the structural protein for the *P. haemolytica* leukotoxin and used it to transfect various cell lines (murine, bovine, canine, and human), but

none of these gave evidence of producing the leukotoxin. We also injected mice with the leukotoxin DNA construct, but we did not find evidence of an antibody response against the leukotoxin.

Respiratory disease (pneumonia) is one of the most significant problems and has significant economic costs for dairy and beef cattle producers in Wisconsin and throughout the world. Succeeding in producing a DNA vaccine that protects against *Pasteurella pneumonia* could be of considerable benefit to Wisconsin dairy and beef cattle farmers.

9. Signaling Functions of P-Selectin Regulation of MAP Kinase Activation

Infectious diseases have moved from the fifth to the third leading cause of death in the United States. To date, there are no commercially available drugs that have shown efficacy in ameliorating mortality associated with septic shock in people. This project proposed to study cellular events central to the pathogenesis of septicemia.

We explored the activation of signaling pathways in human monocytes, cells which can produce potent immune responses.

The work may aid in the development of novel therapeutics for controlling septicemia, which causes an average of 200,000 deaths per year in the United States.

10. Stabilization and Preservation of Skin Cells and Tissue

The goal of this project was to develop a freezing and drying protocol that will eventually permit stabilization and storage of biological systems, including skin tissue, over extended periods of time.

As a result of this project we have developed a better understanding of the key variables that influence the survival of biological systems when subject to freezing and drying. For simple bacteria, we have developed freezing and drying processes which are currently being adopted by Wisconsin companies to produce commercial products. For animal liver cells, we have developed freezing techniques that provide much higher survival rates than available protocols. We are currently investigating the use of these techniques for freezing and stabilizing skin cells.

Developing methods for the stabilization and storage of biological products is essential for the food, pharmaceutical, biotechnology and medical industries. These industries are becoming increasingly important to our state economy, and the techniques and expertise developed through this project are likely to be highly beneficial to them.

11. The use of minocycline to prevent the development of experimental allergic encephalomyelitis: a model for MS treatment.

The objectives of this research were to provide evidence that the drug minocycline could prevent or suppress the experimental disease, allergic experimental encephalomyelitis (EAE). EAE is the best available animal model of multiple sclerosis (MS). The goal, therefore, was to determine whether minocycline might be a relevant therapeutic drug for MS.

We have unequivocally shown that minocycline given either prior to the development of neurologic signs or at the first signs will prevent, lessen, or shorten the disease course. These results were highly reproducible and statistically significant. We showed that minocycline-treated rats showed no inflammation or demyelination in the spinal cord compared to rats injected with a placebo.

These data imply that minocycline should be evaluated in a Phase I or II clinical trial in MS patients.

12. Development of species specific PCR band markers in ginseng

Project objectives were to develop a quick, relatively cheap test using DNA-based SCAR markers to distinguish the two main economic value species of ginseng, *Panax quiquefolium* (American ginseng) and *P. ginseng* (Asian ginseng). The species have different physiological effects and can cause severe health consequences if people don't realize what exactly they are consuming. The first species, indigenous to North America, is worth considerably more than Asian ginseng (*P. ginseng*) on the worldwide markets. Producers of ginseng capsules suspect illegal mixing of the two species, both here in North America as well as in the Orient, as a way for the middle man to reduce production costs.

Presently there is no definitive test to prove that this mixing is occurring, although our unpublished research has verified this to be the case. SCAR markers were successfully developed that did distinguish the two species. This test could also be slightly modified to identify at least three varieties or land races of *P. quiquefolium*, which we have demonstrated via plant collection around the United States.

This research finding could be used in the developing pharmaceutical industry. American ginseng is a crop of significant economic importance to Wisconsin, the leading ginseng producing state, with export sales exceeding \$50 million. An invention disclosure was submitted to the University.

13. Improved Polyimide Sheet Etching

The objective of the project was to explore atmospheric pressure etching of polyimide with charged particle gases, known as plasmas, as an alternative to etching with conventional plasmas under vacuum conditions. Dielectric-barrier discharges, atmospheric pressure plasmas known since the mid 1800's but not well understood, were chosen for this study because they have the advantage that they do not require vacuum systems. Polyimide is a material with many industrial applications and is an important component of a Wisconsin company's product.

We found that polyimide etch rates in dielectric barrier discharges were comparable to those found with plasma operated at pressures of 1/10000. Unfortunately, directionality of the etching, important in many applications, was not established.

Our goal was to provide rapid transfer of successful prototypes from the UW-Madison into production line etchers at HTI in Eau Claire. However, market conditions changed drastically and HTI no longer had a need for more efficient, less expensive production techniques that required new production equipment.

14. Increasing Demand for Wisconsin Consumer Products Through More Effective Quantity-Related Promotion Design

The purpose of this project is to increase demand for Wisconsin consumer products by improving the effectiveness of promotions for these products. The investigator proposed to develop a model to design quantity limit promotions (i.e., in-store price promotions with an explicit limit on the number of units the shopper can purchase) and multiple unit promotions (i.e., promotions wherein the deal price is contingent on purchasing a certain quantity of the promoted item).

This demand-side research project found that the key to the impact on sales is setting the limit and multiple unit promotion (MUP) amounts. Medium and high limits increased purchase incidences; low limits had no effect on incidence; high MUP levels lowered purchase incidence; medium and high limits increased volume; low limits decreased volume; low MUP levels increased volume.

The promotion decision strategies developed in this project will aid manufacturers and retailers in setting quantity restrictions closer to the optimal level. The project received resources from Copps Foods and financial support from Kraft Foods.

15. Ginseng as a Potential Antioxidant

This study intends to establish the potential anti-aging property of ginseng in reducing age-related oxidative stress and enhancing endogenous antioxidant defense capacity. Among the specific aims of the study are to investigate whether ginseng extract would 1. decrease age-related increases in free radical generation in several body tissues such as liver, heart, kidney, and skeletal muscle; 2. induce antioxidants in various tissues; 3. decrease mortality rate at old age; and 4. to determine the dose requirement of ginseng extracts in conferring the antioxidant and anti-aging effects.

Four-month feeding of a ginseng fortified-diet in rats reduced free radical generation in selective tissues. Ginseng feeding also enhances antioxidant enzyme activity in the liver and muscle, and antioxidant enzyme activity in the heart. These antioxidant effects of ginseng appear to be dose-dependent.

Wisconsin is the largest ginseng producer in the world with annual export worthy of millions of dollars. In recent years export of Wisconsin ginseng has been declining continuously, primarily because of increased production of Korean and Chinese ginseng. To revive Wisconsin ginseng industry we must demonstrate the merit of Wisconsin ginseng through research. One of the most effective ways to boost ginseng consumption would be to use it as a food/beverage additive and a nutritional supplement.

16. Neural stem cell transplantation in the injured brain

The objective of this research was to explore the feasibility of using embryonic neural stem cells to repair damage to the adult brain. The stem cells were isolated from the brains of embryonic rats, cultured for several days, labeled with a fluorescent dye, and then transplanted directly into an adult rat brain at the site of injury. Brains were examined microscopically to determine the fate of the transplanted cells.

The results from our preliminary experiments demonstrate that neural stem cells from embryonic rats and cultured as neurospheres can be transplanted to the injured adult brain where they will survive and integrate with the host brain. Moreover, the transplanted neural stem cells differentiate into glial cells and neurons. The differentiation of many of the transplanted cells into neurons is encouraging, because most previous studies have reported that neural stem cells transplanted to the injured brain differentiate predominantly into nonneuronal glial cells.

The research project has led to an extended collaboration with Promega Corporation that is currently exploring the use biocompatible materials to enhance the survival of neural stem cells transplanted to the injured adult brain.

17. Efficient generation of influenza virus vectors

The goal of this proposal was to establish a system that allows the efficient generation of influenza virus vectors for gene therapy and vaccine purposes. We recently succeeded in generating infectious influenza viruses entirely from cloned cDNA, allowing for the first time the efficient manipulation of the influenza viral genome. Thus, we can now introduce attenuating mutations (for vaccine purposes) as well as foreign genes (for gene therapy) into the genome of influenza viruses. We proposed to use this system to generate influenza virus-like particles (VLPs) for gene delivery to target organs without the generation of infectious virus. VLPs lack genes encoding viral structural protein, precluding the production of infectious viruses after VLP-mediated gene therapy. This feature, together with the lack of integration of the viral genome into host chromosomes, would ensure the biological safety of gene delivery.

Using reverse genetics, we were able to generate an influenza virus-like particles, lacking one gene. These virus-like particles retained the ability to infect cells, but did not produce infectious particles from infected cells. They provided protection against lethal infection by wild-type virus in a mouse model,

establishing their suitability for use as a vaccine.

Preliminary data indicate that influenza virus-like particles are efficacious vaccines, providing protection against lethal infection by influenza virus in mice. Thus, this technology has the potential to be developed into vaccines against viral infection in farm animals.

18. Constructing a Plant Antiome

We propose to devise a technology for the large-scale production of antibodies specific to plant proteins of unknown function. These antibodies would be used to evaluate the concentration, tissue distribution, and physiological or pathological relevance of the approximately 20,000 different proteins in the plant genome. We have termed the generation of a library of antibodies to every protein in the genome the "Antiome."

90 peptides (70 plant proteins and 20 human proteins) were synthesized and verified for correct synthesis by analyzing the peptides using a mass spectrometer in the Biotechnology Center. We also optimized the chemical linkage of the peptides to a large carrier protein, and plan to complete the coupling of all 90 peptides to larger proteins shortly. We have made arrangements to immunize mice with all of the peptides so that antibodies can be generated for future analysis. Our hope was that the antibodies that recognized the peptides would also recognize the actual proteins, and that this strategy would be an efficient means of generating antibodies for analysis of all of the proteins encoded by any organism.

The technology being developed has the potential to be the basis of a start-up biotechnology company, which if started, would be based in Madison, Wisconsin.

19. High-Speed Sensor Module for Atomic Force Microscopy

The atomic force microscope (AFM) is not only a widely used research tool but also an increasingly important process characterization tool in the semiconductor industry. Conventional atomic force microscopy involves laser optics, which not only require careful adjustments for each operation but also limit the possible set-up configurations. Portability as well as the possibility of miniaturization is also restricted because of the involvement of optics. The objective in this project was to develop a high-speed, all-electronic AFM sensor module that does not require either laser optics or the rather expensive micro-machined force probes that are conventionally used.

We successfully devised a high-speed electronic system that uses an inexpensive quartz crystal oscillator instead of a micro-machined cantilever as a force-sensing element. We also developed a technique to attach a sharp tungsten probe to the quartz crystal without degrading the performance of the crystal. We developed phase-locked loop feedback electronics and an almost completely digital electronics package.

The high-speed, all-electronics AFM sensor module we developed has a high potential of becoming a key component of an AFM as well as various other nanoprobe instruments. The system is currently being considered for testing on an existing AFM at UW-Madison. We are aware of at least two Wisconsin companies that are developing nanoprobe instruments. Nanotechnology will have an increasingly important impact on the state economy, especially as biotech and nanoengineering begin to merge.

20. Why Are Our Cranberries Rotting in the Field?

The lack of knowledge regarding the etiology and epidemiology of cranberry fruit rot in Wisconsin prompted two objectives: 1) to compare (qualify and quantify) the fruit rot pathogens

found in newer upland and traditional lowland cranberry marshes; and 2) to evaluate methods for sampling fruit rot pathogens.

The investigators identified the fungi in upland and lowland site types and compared the sites in terms of rot incidence and harvest type (wet- or dry-picked). Upland and lowland sites did not differ significantly in rot incidence, and in general, rot incidence did not differ significantly between dry-picked and wet-harvested samples. There were no consistent differences between upland and lowland sites for the frequency of any fungus in either rotten or sound fruit.

The project was initiated following severe outbreaks of cranberry fruit rot in Wisconsin. At that time, the price of cranberries was high, and growers were quite concerned about anything that decreased marketable yields. They were ready to use fungicides to control fruit rot, despite the fact that the primary fruit rot pathogens in this state really weren't known. Since this research, the price of cranberries has dropped precipitously, and a marketing order has been in place (2000 and 2001) to restrict the amount of fruit that a grower can sell. The low prices and lack of incentive to produce large yields has reduced the importance of fruit rot to most growers--it is not economically sound to treat with fungicides at the current cranberry price. However, when the market rebounds, these findings will be used to guide growers in their fruit rot management decisions. During the course of this research, the investigators persuaded a few growers to withhold fungicide sprays.

21. Transgenic Bioassay for Neurotoxicology Screening

The goal of this project was to test the utility of a transgenic mouse expressing green fluorescent protein (GFP) to serve as a rapid and cost-effective reporter of neurotoxicity. Methods were to be developed for quantifying levels of expression of the GFP, and animals were to be exposed to sample neurotoxins for comparison of the transgenic GFP assay with standard ELISA assays.

We developed methods for quantifying GFP expression based on confocal microscopy of tissue sections and spectrofluorometry of tissue extracts. Exposure to two different neurotoxins resulted in increased expression of GFP as measured in tissue extracts prepared from discrete areas of the central nervous system.

We received a small SBIR grant to engage in research that provided employment of staff, income to the University Research Park, and we purchased supplies from local businesses.

22. Development of Chromium Recovery Technology for Leather Industries

Waste that is generated by leather industrial facilities and then is landfilled has become an increasingly costly problem for manufacturers and a significant stress on the environment. The main objective was to study a method for recovering chromium, which is tightly bound with proteins, from sludge in leather tanning facilities. This study also addressed a prior safety concern caused by foam that was generated in the extraction process.

The study showed that extracting chromium with sulfuric acid and then adding the extract to the existing chromium reduction process allows for the most economical recovery of chromium from alkaline digested leather waste products. The chromium-free leather waste products can be safely landfilled or further processed for animal feed.

The results were discussed with the personnel at the U.S. Leather, Inc., Milwaukee, Wisconsin. Although they have decided to shut down the leather tanning operation because of fierce competition from third world countries, these results will be published so that other tanneries can use this technology.

23. Potential of flavonoid nutraceuticals in cranberries and cranberry products

Wisconsin is the leading state in cranberry production, and cranberries are the most important commercial fruit crop in Wisconsin. They are rich in flavonoids that have potential health promoting effects, such as against coronary disease and cancer, and for treating urinary tract infections. The objectives were: 1. Identify and quantify the flavonoids in cranberries, cranberry products, and cranberry by-products. 2. Determine the effects of processing for juice and other products on flavonoid composition. 3. Determine differences in flavonoid composition among fruit parts. 4. Determine the variation in flavonoid composition among cranberry genotypes.

We developed an HPLC method that efficiently separates the cinnamic acids and flavonoids in cranberries. Our results indicated that the process of making juice changes the composition of cinnamic acids, and hydrolysis of flavonol glycosides occurs as a result of the juice extraction process. 19 individual flavonols were detected--a larger number than would be expected from the published literature.

Cranberry production directly employs thousands of Wisconsinites, and the total industry output was estimated at more than \$300 million. Improved knowledge of the structure and concentration of flavonoids in cranberries may lead to development of foods and beverages that are enriched in flavonoid nutraceuticals.

24. The Effects of Cranberry Flavonoids on the Expression of Cell Adhesion Molecules In Vitro and In Familial Hypercholesterolemic (FH) Swine

There are three objectives for this research project: 1. To determine the effects cranberry flavonoids have on *in vitro* and *in vivo* parameters related to the inflammatory process that occurs in atherosclerosis. 2. To determine the effects a flavonoid rich cranberry product has on circulating levels of cellular adhesion molecules in swine with familial hypercholesterolemia (FH). 3. To determine the effects of a flavonoid rich cranberry product on the atherosclerotic lesions of FH swine.

1. We have isolated and characterized aortic endothelial cells from swine. Data suggest that whole cranberry extract decreases expression of a cellular adhesion molecule, E-selectin, on swine aortic endothelial cells; however, we are still working out methods to test the effect cranberry flavonoids have on E-selectin expression. 2. We have not been able to find antibodies that cross react with circulating cellular adhesion molecules in swine, however; we are working on other techniques to measure the levels of circulating cellular adhesion molecules in swine. 3. We are still working to analyze lesions of the swine.

Cranberries are an important commercial fruit in Wisconsin. Cranberries and cranberry products could be marketed as a "functional food."

25. Highly Filled Formaldehyde-Free Renewable Fiber Thermoplastic Composites

The objective of this project was to study the mechanical and dynamic mechanical behavior of highly filled composites of lignocelulosic fiber (85% by weight) in thermoplastics and compare them with traditional composites for strength, toughness on impact and flexible strength.

A new technique has been developed that allows very high fiber loading. We have processed composites up to about 95% by weight of fiber in polypropylene (PP). The process involves some additional processing steps, in addition to conventional compounding techniques, to achieve such high fiber content in PP. Studies on about 85% kenaf-PP composites indicates that properties such as flexural modulus and strength are superior to most types of wood particle, low and medium density hardboards.

Many of the mechanical properties of these new high fiber-filled composites may approach those of conventional thermoset composites, although creep and high temperature usage are likely to remain a problem. The ability to recycle the thermoplastic composites could be a significant advantage compared to

thermoset based lignocellulosic composites. At this stage the results are still preliminary and further research needs to be done before a Wisconsin company can consider developing it as a new material.

26. Soil Moisture and Strength Sensing System for Precision Agriculture

The objective of this research was to develop a soil moisture sensor that can be used to provide soil moisture data for field mapping and control systems

A soil moisture sensor was developed to obtain data as a tillage tool or some other soil engaging tool moved through the soil. The soil moisture data could be collected and stored for future reference or used for input into a control system to adjust the operating depth based on soil moisture. One example where this is important is planting equipment where the seed must be placed in moist soil for rapid germination. The sensing unit has two electrodes built into the wedge of a subsoiler shank, and an impulse is transmitted to the electrodes and reflected back. The time required for the impulse to return is a function of the soil moisture.

27. Flexible Resource Scheduling in Production Systems

The project aims to improve production scheduling in manufacturing firms by taking into account workforce changes that have occurred in many firms, namely the increased importance of workforce flexibility and cross-training of workers. This effort builds on the PI's recent research in the areas of large-scale optimization, simulation modeling, and decision making.

The research results will bring the state-of-the-art decision and optimization methodology to the enterprise resource planning (ERP) software industry, generate technological impacts in terms of new decision tools and their empirical studies via e-commerce business environment, and further enhance the existing scientific collaboration between researchers between university and industrial colleagues in both basic research and implementation of ERP systems.

28. Coupling Photocatalysis with Electromagnetic Energy for the Enhanced Degradation of Organic Contaminants

The objective of this project is to couple the use of microwave energy and photocatalytic processes to determine if the rate of a photocatalytic reaction is higher compared with the reaction rate with just photocatalysis (i.e., no microwave energy). We believe that if we can couple microwaves with water and "remove" the water molecule from the catalyst surface, that more reaction "sites" can become available for the target contaminant, leading to higher reaction rates and removal of the target compound. In this project, ethylene is the target compound.

The project used two approaches to couple microwaves with photocatalysis. In Approach 1 (fluorescent light sources and catalyst exposed to microwaves), the use of microwaves in the photocatalytic oxidation of ethylene gas on a catalyst surface demonstrated that the reaction rate constant increased by over photocatalysis only. In Approach 2 (only the catalyst was exposed to microwaves), the microwaved-coupled photocatalytic reaction rate constant was much higher than that achieved by photocatalysis only. These results demonstrate the benefits of coupling microwaves with photocatalytic oxidation.

There is a large market for technology that efficiently removes gas-phase contaminants and airborne microbes from air.

29. Novel DNA Technology for Genetic Diagnosis

There is a great need for cheaper, quicker, and more reliable techniques to assay for polymorphisms associated with predisposition to human disease. The objective of the project was to

validate a mutation detection technology for genetic diagnosis of clinically relevant genetic targets--a mutation in a blood-clotting gene and in an *in vivo* regulatory gene.

The Third Wave "Invader Assay System" technology is aimed at clinical applications but the project is also likely to positively impact basic research by significantly reducing the time and expense involved in a variety of existing genotyping applications.

Third Wave is a biotechnology company in Madison, Wisconsin. This technology will enhance the company's position in the diagnostic marketplace and position it for growth to further the State of Wisconsin's economic development.

30. Area-Wide Management of Vegetable Production Crops Using GPS and GIS Technology

The objective of the project is to establish an information lab that uses GPS and GIS technologies to manage the crop and pest management activities of vegetable growers and processors in Central Wisconsin.

Among the potential outputs are variety performance by soil type, fertility, and pH; yield response to nutrient levels, pest thresholds, and cultivar selection; and impacts of rotation and pest management on crop yield.

Area-wide information on pest development, epidemiology, and movement would result in reduced pesticide inputs and greater environmental and natural resource protection, improved crop production, and greater profitability through more effective management at the whole farm and area levels.

31. Anti-viral strategies that resist viral escape

Anti-viral drugs can fail when the viral functions they target develop resistance by mutations that attenuate the drug-target interaction. We sought to design new strategies that could anticipate and counteract such virus escape pathways. Following the initiation of the UIR support we shifted our experimental plan from anti-viral strategies to viral vaccines. We received useful feedback on our anti-viral strategy from a prominent HIV who said it needed to be demonstrated on a mammalian viral system, preferably *in vivo*, in order to attract the attention of clinical researchers or the pharmaceutical industry. Additionally, recent work on a mammalian vesicular stomatitis viral (VSV) system, coincidentally demonstrated how genome rearrangements of the virus could attenuate its growth. Although we are working on virus VSV, we are in the early stages of developing a model for its growth, so it was too early in our investigations to begin planning *in vivo* anti-viral drug strategies on VSV.

To follow up on this promising direction, we generalized our simulations on virus phage T7 to predict the growth characteristics of T7 genome rearrangements and then constructed and characterized these strains in the lab in collaboration with an expert microbiologist on phage T7.

The strategy for generating attenuated vaccines has value, both for human as well as animal health. Given the strong dependence of the Wisconsin economy on the dairy industry, safer more effective attenuated vaccines may well have value.

32. Vitamin D Analogs in the Treatment of Mouse Models of Retinoblastoma

Our goal for this study is to characterize the effectiveness and toxicity of a new vitamin D analog, 1alpha-OH-D2, against tumors in two mouse models of retinoblastoma. Vitamin D analogs have been shown to be effective in tumor inhibition for a variety of tumor types, but some compounds are toxic due to high levels of serum and kidney calcium. Using a transgenic mouse model that mimics human intraocular retinoblastoma and a nude mouse model that is implanted with human retinoblastoma cells, we will develop a dose-response curve to generate an effective dose of the new vitamin with low toxicity.

We found that doses in the range of 0.2-0.3 micrograms/ml of the vitamin showed approximately >40% reduction in tumor size, when compared to control animals, with a small increase in toxic effects and mortality rates of 30%. Our studies are nearly complete, and we anticipate that effective doses of the new vitamin will be in the same range of 0.3 micrograms/ml that was determined from the mouse studies. The transgenic animals have lower toxicity and mortality, however, with very low mortality rates.

The results of this project enable BoneCare International, Inc., to pursue the use their vitamin D analog in another treatment scenario. BoneCare will benefit by increased production and commercial value of the product.

33. Electronic Water Softeners Based on Nanoparticulate Pseudocapacitors

An electronic water softener would simplify the present water softening process by eliminating the regeneration step that requires a brine solution. This technology would also have applications for water polishing, desalination, and waste treatment. Our project had four major objectives: 1. Improve the electrode. 2. Demonstrate that the electronic water softener will remove ions from a test solution. 3. Determine the amount of ions removed and the time required to remove them. 4. Determine the loss in removal capacity after several thousand charge/discharge cycles.

We developed a method for synthesizing and coating the active material on a nickel foil. The coating was done in one step using a process that should readily scale up for commercialization. These coated electrodes did remove some calcium from a test solution when 0.8 V was applied across the electrodes for about 30 minutes. An initial effort to monitor charge/discharge cycles in this system was unsuccessful, probably because the test procedure did not account for the large time constant.

A start-up company in Madison, Wisconsin has been identified that is interested in further developing this technology once some additional data is obtained with this system. Microporous Oxides Science and Technology, LLC, Oregon, Wisconsin, would synthesize the active materials for the electrodes and assist in fabricating the final electrodes. The start-up company would assemble and market units designed for each application of interest. Since WARF holds some intellectual property rights to this technology, licensing fees from the sale of these units would directly benefit the University of Wisconsin-Madison.

34. Tactile Feedback from a Surgical Catheter

Current techniques for guiding catheters contain inherent limitations on the level of attainable information about the catheter's environment. The physician at best has only a two-dimensional view of the catheter's position and is restricted to visual sensory input. This limitation greatly reduces the surgeon's haptic perception of the environment in the immediate vicinity of the catheter tip. The goals of this project were twofold: 1. Develop a sensate prototype surgical catheter and characterize its response to applied forces; and 2. Use the prototype probe, along with a Tongue Display Unit (TDU) we previously developed, to determine if distal probe orientation and contact information can be perceived from the patterns of electro-tactile stimulation on the tongue.

The goals of the project were accomplished, resulting in the development of two unique prototype probes (albeit larger than required for surgical use), and a successful human psychophysical experiment. The research conducted during the project proved the utility of using patterned electro-tactile stimulation on the tongue to perceive catheter orientation and contact information, and revealed opportunities for future development of this prototype system.

To the extent that the basic approach of this technology could be miniaturized and integrated into a standard catheter, it could represent a significant improvement in non- or minimally-invasive surgical

techniques. If subsequently patented, developed, and market through a medical products manufacturer it could have significant economic impact via revenues generated from sales of the device. We are currently planning grant applications to NIH for both basic research, and an SBIR for system development and application. The former would be to the UW, the latter to a small, high-tech university spin-off company in Wisconsin.

35. Extreme high-power (>1W) single-mode semiconductor diode lasers

The project main objective was to realize a semiconductor-laser structure both suitable for high-power, single-mode operation as well as operating in a narrow transverse beam pattern. A secondary objective, key to the realization of the primary objective, was the realization of a crystalline semiconductor compound previously not developed.

The results can be summarized as follows: 1. Relatively thick layers were grown, which showed excellent crystalline quality verified via X-ray analysis, as well as strong photoluminescence response, thus making it quite suitable for incorporation in the proposed semiconductor-laser structure. 2. Multi-layer semiconductor-laser structures were grown and optimized for maximum photoluminescence response. 3. Diode lasers were fabricated, which were found to have low losses as well as the desired narrow transverse beam patterns.

The results of this project are of significant importance to the development of a high-power laser commercial product for fiber-optical communications by AlfaLight Inc., a start-up company in Madison. The high-power laser product planned to be commercialized by AlfaLight will have 3-4 times more power than any other available commercial laser for the application as pump laser for optical amplifiers. The market for such devices has been growing at approximately 70% per year, and will reach \$1 billion in about the next two years.

36. Fox River Valley Integrated Waste Management Project

Increased competition for land, rising landfill costs, increasingly restrictive regulations, and loss of land to development are obstacles to land spreading or landfilling of organic wastes in Northeast Wisconsin. This area of the state is home to food processors, municipal wastewater treatment and solid waste facilities, paper mills, wood manufacturers, and livestock producers. The main objective of the project was to evaluate the economic and technical feasibility of combining organic wastes in a centralized facility, processing the waste into soil amendments, and marketing the finished products.

A project steering committee and an advisory group were formed; several organization models were developed; case studies were written; a feedstock survey inventory was compiled; market and attitudinal surveys were conducted; the institutional setting and regulatory framework was analyzed; and a financial analysis was written.

The completed Phase I feasibility study will serve as a decision making tool and supporting document for securing project funding for a pilot-scale waste processing, marketing, and distribution facility to be constructed in the Fox River Valley.

37. Mapping, cloning of rice resistant to *M. grisea*; analyses of transformed strains of *M. grisea*.

The objectives of this project were to identify specific genes in rice that give resistance to pathogens of canola and corn. A pathogen of rice is used as a vehicle to assay pathogens of canola and corn, asking whether any clones genetically transformed into a rice pathogen converted the rice pathogen to reduced virulence on one or more rice lines. Crosses between rice lines that differ in their resistance to the genetically transformed strains have identified genes in rice that give resistance to rice pathogens that

have received their avirulence from pathogens of canola and corn. Genes thus identified in rice are to be cloned and transferred to canola and corn, giving resistance to pathogens of canola and corn.

Results of this project suggest that many genes in rice give resistance to the pathogens of canola and corn. We will now identify the individual genes in each rice progeny plant so that we can clone each resistance gene to be transferred to canola or corn.

If we can get resistance in corn so that no mycotoxins are present in corn produced in Wisconsin, then Wisconsin farmers could sell their corn anywhere in the world. Resistance to the black stem disease in canola could mean that Wisconsin farmers could grow canola as an alternative crop. The process is not limited to finding genes in rice for resistance pathogens of importance. It can be generalized to finding genes for disease resistance in any plant species, and possibly other organisms.

38. Feasibility Study of Reuse and Recycling Construction Materials from Badger Army Ammunition Plant

The objectives of this research program are to: 1. Examine the possible use of construction materials from Badger Army Ammunition Plant in other construction applications. 2. Examine the structural integrity of the building members and other base materials. 3. Identify the wide range of applications for this material, study past deconstruction cases, identify industry needs for recycled materials, and assess the integrity of existing materials.

Although all materials may eventually be considered, the focus to date has been on the reuse of wood and structural timbers. A building survey completed during the summer of 2000 established the material quantities for seventy-six buildings of the highest value. Preliminary findings show that significant deterioration has occurred in recent years as the funding for building maintenance has been cut. Buildings that are not weather tight quickly and dramatically lose value as wood deteriorates, therefore, water must be kept out of the buildings in order to preserve material reuse options.

39. Development of CO₂-Based Popping Products

Popping candy products (trademark "Pop Rocks") is a hard candy made under pressure with small pockets of high pressure CO₂ that release during consumption. The primary scientific objective of this project is to understand the relationships between the physico-chemical characteristics of a material and its acceptability for making popping products. A second objective is to develop manufacturing protocols for production of acceptable formulations.

A formulation was developed that fit the needs for making a popping product with sugar-free ingredients. We also developed a test protocol for measuring the extent and degree of popping of commercial products. The test is based on measuring the sound intensity under controlled conditions as the product dissolves in water.

At this point, the Wisconsin company we were working with is in financial difficulty. Their product is not competitive with international products and they are having trouble getting orders. It is possible that development of a sugar-free popping product will help them, but they have no personnel available for product development trials.

40. Gene Targeting of Smad3 in NIKS Human Keratinocytes

The supported project will determine whether human skin that is mutant for the gene Smad3 might be beneficial clinically for wound healing. In the mouse, mutation of the Smad3 gene results in faster wound healing of mouse skin. The objective was to create a gene targeting DNA vector that could be used to mutate the gene Smad3 in human cells.

A gene targeting vector was successfully generated by cloning eight specific DNA fragments together in the proper order and orientation. The structure of the final clone was verified by DNA sequence analysis.

Stratatech Corporation in Madison is developing skin equivalent skin grafts based on UW-Madison technology. The project funded by UIR could provide a unique product in this marketplace which would enhance the growth of this new company, leading to increased employment opportunities and revenues.

41. Characterization of Antineoplastic Activity of Crystal Violet Derivatives

The objective of this proposal was to quickly generate experimental data to support the patenting of a new series of drugs specifically tailored for photochemotherapy of cancer. We proposed to complete the synthesis, isolation, and chemical characterization of a new series of Crystal Violet derivatives and confirm our hypothesis that these compounds would show high phototoxicity towards tumor cells but just minor (negligible) toxicity towards normal cells.

We completed the synthesis, isolation, and characterization of all proposed drug candidates, a series of 6 compounds, and confirmed our original hypothesis that these compounds display the structural features required for high phototoxicity towards tumor cells but just minor phototoxicity towards normal cells.

Our results have provided solid grounds for the application of a WARF's patent and also for the application a second WARF patent on this technology. The PI of this project has started a new company, PharmaLux, LLC, to explore the commercial applications of this technology. The results produced in this study have further demonstrated that our technology has commercial potential. However, this technology could be licensed to a better established company outside Wisconsin and generate licensing fees. In October 2001, a representative of Theratechnologies will be visiting Madison to discuss the possibility of establishing a consortium and/or license out technology. However, if no better established company license this technology from WARF, the PI of this project would very seriously consider licensing it from WARF through PharmaLux. In addition, the results obtained in this study have helped the PI to write a more competitive grant proposal for \$640,395 to the American Cancer Society. It scored highly and will likely be funded.

42. Developing and Pilot Testing an Environmental Management Assessment System for Wisconsin's Dairy Industry

The primary objective of this project was to develop an environmental management system that aids producers in identifying and addressing risks that may have a negative impact on the environmental and/or milk quality.

The environmental management support system was developed and funding was obtained to pilot test the materials and program in the second year.

The development of an environmental management assessment system for Wisconsin's dairy industry provides a cost-effective way for producers to identify and address management needs that reduce environmental risks and improve milk quality, essential steps to maintaining or increasing profitability and environmental sustainability. Effective employment of this system may reduce the extent and cost of regulations.

43. Improvements in Expression Systems for Clostridial Proteins

Clostridial toxins and antigens have tremendous potential as pharmaceuticals, and the technology

for botulinum toxin as a pharmaceutical is in its early stages of development. A major area of opportunity for improved botulinum and other clostridial products are genetic systems for modification and improved expression. The broad project objectives were to design improved plasmid vectors for the expression and manipulation of clostridial genes.

The project yielded several valuable results for the construction of new vectors with improved properties. These improvements included: transposition of the transfer region within the vector to improve the frequency of conjugative transfer from *E. coli* to *C. botulinum*; introduction of additional restriction sites to facilitate gene cloning; insertion of protein tags into the vector for protein isolation; and construction of two integrational vectors.

The UW-Madison has been integral in the development of botulinum toxin as a pharmaceutical and WARF holds several patents. Clostridial toxin technology has also resulted in the formation of a profitable company, Metabiologics, Inc., which occupies a laboratory at the UW Research Park. Royalties on toxin sales are paid to WARF. However, the Metabiologics activities are limited to biochemical purification of native toxins. It is apparent that the future of toxin technology lies in the development and expression of recombinant toxins. These will have improved properties as pharmaceuticals. This research has provided a foundation for these improved toxins and their expression systems.

44. Miniature, Micromachined Positioning Devices with Sub-Nanometer Resolution

As nanotechnology becomes increasingly important in our economy, there is an unmet demand for compact, high-speed positioning devices in the microscopy, magnetic recording, micro-tools, and printing industries as well as in chemistry and genomics. In a prior I&EDR project we developed an all-electronic atomic-force sensor module (AFM) that is suitable for miniaturization. If we were to be able to combine this module with a miniature motion stage that moves the sensor module and probe across a sample, we would realize a compact all-in-one AFM module, which could be part of a wide variety of nano-probe instruments. The objective of this project was to develop a miniature motion stage suitable for such a purpose.

We proposed an actuation mechanism that does not produce sufficient force to overcome friction and imperfections in the test fixture. At this point we have to conclude that this form of actuation will not work, but another form of actuation may be feasible. We have designed several geometrical patterns integrating the stage, the flexure hinges, and the frame. In those designs the stage is constrained to move along a single axis without unwanted parasitic motions along other axes. Preliminary computer simulations were performed on the designs to investigate the stage motion under simulated loads.

PIEZOMAX Technologies, a UW-Madison spin-off start-up company presently with 10 employees and located in Middleton, Wisconsin, is the only company in the US (there are two foreign competitors) supplying nanomechanical motion stages and nanopositioners to the semiconductor industry and to research institutions. Adding high-performance miniature positioning stages that we conceptualized and investigated in this research to its product line would significantly strengthen the company's presence in this market, which is growing at 30% annually from the 2000 base of about \$40M.

45. A Novel Clinical Screening Method for Human Papillomaviruses that Cause Cervical Cancer

Certain human papillomaviruses (HPV) are recognized as the chief etiological agents of cervical cancer in women. We are developing a novel approach for HPVs in clinical samples. The technique is based upon the application of a genetic screening method developed by Epicentre, a Madison-based biotechnology company.

The chief scientific goal of the project was to develop 'primer sets' that would allow us to detect in clinical samples the genetic information from that subset of HPVs associated with cervical cancer. These primer sets had to be engineered to specifically and selectively detect all those HPVs that are associated with cervical cancer. We were able to demonstrate that the primer sets we designed do indeed preferentially amplify these particular HPV genomes. Our study was limited however by the fact that we need to further increase the sensitivity of our primer sets to allow detection of very low numbers of the viral genomes that are commonly present in clinical samples.

If we can improve the sensitivity of the primer sets to allow robust detection of HPVs in clinical samples, then we would approach Epicentre regarding development of a HPV DNA detection kit based upon their technology and our primer sets.

46. Rapid detection of virus using liquid crystal technology

In this study the PIs aimed to adapt a liquid crystal technology developed in their lab for the detection and identification of viruses, specifically mouse hepatitis virus (MHV), which is the most important problem in laboratory colonies of mice. It is an important economic threat to animal breeders, and it has an impact on all research institutions that utilize mice in their studies. Additionally, development of technologies for the rapid detection of viruses is of enormous importance to national security and public health.

The PIs were able to produce nanostructured surfaces that had features matched to the size range of mouse hepatitis virus (MHV), examining the suitability of four different materials for the production of such surfaces. They functionalized these surfaces with antibodies to MHV, showed that antibodies had bound, demonstrated that liquid crystals would align uniformly to the surfaces with antibodies, and showed that MHV could bind to these surfaces. They obtained monoclonal antibodies to MHV and will optimize the system with these new antibodies.

The PIs have formed a company, Platypus Technologies, LLC located in Madison to pursue commercialization of this novel technology.

47. Identification of Nutrient Removal Bacteria in ORBAL Wastewater Treatment Plants

The identity of phosphorus removing bacteria in wastewater treatment in general remains unresolved. Orbal treatment plants do not conform with the general design rules for phosphorus removal, but they efficiently remove phosphorus from the wastewater. An objective was to use molecular methods recently developed in our lab to evaluate whether the phosphorus removing bacteria in an Orbal plant was similar to or different from phosphate removing bacteria in more conventional processes.

The research provides a scientific explanation of why Orbal plants are efficient at removing phosphorus, even though their design characteristics are different from those of more conventional phosphorus removing treatment plants. Because recent experimental evidence suggest that bacteria related to the genus *Rhodocyclus* are key actors in phosphorus removal from wastewater, and we targeted this bacterial group for cloning and sequencing. Our analyses revealed that although *Rhodocyclus*-related bacteria were present in the full-scale Orbal plant, they were significantly different from the *Rhodocyclus* organisms that have been associated with phosphorus removal in more conventional processes.

Orbal treatment plants are designed and marketed by US Filter/Envirex, a Wisconsin-based company. This information allows USFilter/Envirex to market their product more aggressively.

48. Genetic engineering of male-sterile alfalfa

Increases in forage yields of alfalfa have lagged far behind the yield gains made in many other

crops. The long term goal of the project is to genetically engineer a male-sterile alfalfa for hybrid seed production in order to increase alfalfa yield. We planned a two-stage experiment using different constructs to establish a selection system based on herbicide resistance. Once resistant plants were obtained, we planned to evaluate these for male-sterility.

Embryogenic callus was treated, and embryos were obtained and transferred to rooting medium, but no plants developed from these embryos. A second construct was tested using herbicide selection. This produced a few resistant calli, but no embryos or plants. We concluded that either the transformation system was unreliable or that the constructs could not be transformed or expressed in alfalfa.

Alfalfa is the most important forage crop in Wisconsin, and it is essential for a healthy dairy industry. There has been essentially no genetic gain in forage yields in a half century of breeding, but if successfully implemented, hybrid breeding could provide a much needed boost. To do so, we need a male-sterile line with linkage to herbicide resistance for efficient hybrid seed production.

49. Improved Cryocoolers for X-Ray Detectors Using Shape Memory Alloys of Titanium Nickel

Together with Research and Technology Corp. (RTC) of Madison and Noran Instruments of Middleton, Wisconsin, we investigated the use of an alloy to dampen vibrations in Noran's cryocooled X-ray spectrometer. The project is expected to improve the reliability of spectrometer, and it will enhance its sale to the computer chip manufacturing industry.

Although initial tests of the samples in the Spring of 2001 were inconclusive due to problems associated with low thermal conduction through the TiNi samples, new designs for incorporating miniature cryocoolers into the spectrometer have been developed as a result of this project.

The spectrometer represents a \$5 million per year market for Noran with primary customers such as Intel and Motorola in the chip manufacturing industry. RTC expects to produce either the vibration damping components or the miniature cryocooler for sale to Noran.

50. Factors affecting the breaking and bending forces of corrugated fiberboard inserts and containers during setup and closure

A significant number of musculoskeletal injuries are associated with packaging operations, and many companies encounter production downtime because of machine problems associated with automatic bending of corrugated board. The objective of this project was to identify factors that affect the (often high) force required during manual set up and closure of corrugated boxes. The influence of the scoring method was of particular interest. A secondary objective was to develop a simple, accurate, reliable, and portable means of quantifying these forces during in-plant studies.

We built a portable device capable of bending a sample of corrugated fiberboard while continuously measuring the required forces. We tested and calibrated the device, which provides a graphical output of the bending forces in relation to the angle of the bend, and we are continuing to collect data.

Workers compensation costs associated with cost Wisconsin employers over \$117 million in 2000. At least two large companies have been identified that currently specify bending force limits for corrugated boxes.

51. Assessment of Milk Quality and Economics of Automatic (Robotic) Milking Systems

The objectives this research effort were to evaluate the ability of automatic milking systems to maintain acceptable milk quality under Wisconsin conditions, identify critical management strategies to achieve quality milk production, and to perform a preliminary economic analysis of automated milking

systems for typical Wisconsin situations.

The collapse of the research barn in early January 2001, delayed our project, and at the time of this submission we have been in operation for about 4 months. We have determined that it is possible to produce milk of exceptional quality, but in a number of areas, such as detection of clinical mastitis and modification of cow behaviors, high levels of human interaction to manage the system are required. We have not been able to test the limits of the system regarding stocking density and milk production, which limits our ability to predict the economic constraints. It appears that a significant challenge for these systems will be to maintain high milk production when the system is stocked to its capacity.

Wisconsin has been identified as a target market for automatic milking systems as the dairy industry is predominated by small- to medium-sized, single-family farms, for which automatic milking is well suited. This technology offers an opportunity for improvement in the quality of life for farm families that can adopt automated milking. This will help to maintain the level of dairy production in the state, which fuels manufacturing and processing sectors.

52. Transportation: Planning and Scheduling

Organizations need help to efficiently allocate and schedule their resources for optimizing transportation operations. Effective use of manpower and equipment requires a tool that accurately reflects all operational constraints. The objective of this project is to develop planning and scheduling software tools for transportation systems.

During the course of the project, new scheduling methods and techniques for improving transportation systems performance have been developed. These research results will have important applications to modern transportation planning and scheduling issues.

53. OA Pulping Process for Energy Reduction in Papermaking

Wisconsin's papermaking industry makes extensive use of mechanical pulping, a process which has substantial operating costs due to significant electrical energy consumption. The goal of this research is to validate a new pulping process using an environmentally-benign, organic chemical treatment that potentially will reduce pulping electrical energy requirements.

Experimental data was obtained that validates a reduction in pulping electrical energy requirements of 25-30%. We also collected other information on pulp properties.

Based on this information and testing of the resulting pulp properties, a patent on the new process was filed by WARF. The data obtained is essential to design the full-scale mill process. With this new technology, we might be able to save 30% on electrical energy costs, and at the same time substantially improve paper quality. The impact on the economics of the industry would be dramatic.

54. Technical and Economic Feasibility of Fungal Pretreatment of Wood Chips for Sulfite Pulping

In the paper industry, chemical pulping is facing increasing pressure in terms of environmental regulations, energy usage, and profit margins. We are proposing to develop a new technology called bio-sulfite pulping that uses wood chips treated with selective lignin-degrading fungi prior to pulping to increase pulp yield and to reduce cooking time, temperature, chemical load and emissions, and effluent load.

Due to a staffing delay, the work on this project has only recently begun and the work is still in progress. Preliminary results, however, have shown that the fungal pretreatment process for sulfite pulping reduced effluent toxicity by 57% compared to the untreated control without affecting the yield. These results indicate that less bleach chemicals may be required during bio-sulfite pulping and that the effluent

produced may be less toxic.

Paper mills under pressure to reduce chlorine or chlorine dioxide usage would use less of these chemicals in their bleach plants, leading to significant reduction in effluent load and emissions, thereby improving the environmental impacts and economics of papermaking. Some mills could increase throughput and thus get more pulp production from the existing capital investment. Equipment manufacturing and construction work needed to implement the new bio-sulfite pulping technology would be performed by Wisconsin industries.

55. Development of a Device to Implant Radioactive Sources for Prostate Cancer

The objectives were to design a device to improve the quality and accuracy of radioactive implants for the treatment of prostate cancer and to build a prototype. The device would be computer-driven and allow for free placement of the radioactive sources, unlike the current fixed-hole templates used for that purpose. Such a device would reduce the probability for errors committed during implantation.

The design for the implantation device progressed from a conceptual sketch to a shop diagram. We accomplished the difficult tasks of finding the appropriate motor for the motions, which required very small dimensions yet high precision and adequate torque, and selecting the motor control electronics. The support frame for the device has been manufactured and test drive gears were placed. We are just beginning testing the motor with the gear.

The Wisconsin company, Standard Imaging, has assisted with the development of this device, and would likely either become the manufacturer or marketer.

C. Applied Research Program

Applied Research Program projects are funded through a competitive process administered by the UW System Office of Academic Affairs. All proposals were first evaluated by an institutional review panel before being submitted to UW System Administration.

In 1999-2000, a total of 45 proposals requesting approximately \$1,900,000 were submitted for review to the UW System. In 2000-01, a total of 21 proposals requesting approximately \$1,600,000 were submitted.

Each proposal was then reviewed and rated by a UW System review panel comprised of five representatives of UW System institutions, a representative from the Wisconsin Department of Development, and a staff member from the UW System Office of Academic Affairs.

In addition to the quality of the research design and likelihood of successful completion, a major criterion for selection was the potential impact of the project on Wisconsin's economy.

1999-2000

1. Enhanced Development of Semiconductor Devices and Materials Using Transmission Electron Microscopy.

The goal of this project was to use UW-Eau Claire's recently acquired High Resolution Transmission Electron Microscope to provide sample analysis for local industries, with higher quality and lower cost. The collaboration established under this project has been successful, and efforts are being made to extend this analysis capacity to other manufacturers.

2. Removal of Fine Particulate Matter From Intensive Recirculating Aquaculture Systems using Microfiltration.

The goal of this project was to assess the effectiveness of commercially available membranes for use in filtering aquaculture waste streams. Experimentation showed that cross-flow membrane filtration is an effective technology for the removal of fine particulate matter from intensive recirculating aquaculture systems. In addition to improvements in water quality, these membranes remove pathogenic and/or parasitic organisms, reducing the chances of losses due to disease. Work on the commercialization of this technology is continuing.

3. Production of Transgenic Dairy Cows Resistant to Fatty Liver.

Fatty liver is a common and important problem in high-producing dairy cows. The objective of this project is to address this problem by raising the level of cholesterol-reducing proteins. The technique has been successful with mice. The project is moving to experimentation with larger ruminants. While the results are not yet in, one biotechnology company in Wisconsin has already made steps to license this technology in anticipation of successful results.

4. Enhancing the Safety of Bacteria for Registration as Crop Inoculants.

The goal of this project was improve the utility of *bacillus cereus* in protecting soybeans from plant disease by making the bacillus non-toxic to humans. In its initial steps, this project identified and then removed one of the genes that make the bacillus toxic. Removal of the gene has not affected the effectiveness of the bacillus in field tests. The effect of removing the second gene for toxicity is currently being tested.

The results of this work will be to provide a safe alternative to synthetic fungicides. Since biocontrol represents a new technology, the successful entrance into the marketplace of a new agent for biocontrol of plant disease will attract attention in the industry at large.

5. Increasing Demand for Wisconsin Consumer Products Through More Effective Quantity-Related Promotion Design.

The purpose of this project was to increase demand for Wisconsin consumer products by improving the effectiveness of promotional activities. The promotion decision strategy developed in this project will aid manufacturers and retailers in setting quantity restrictions closer to the optimal level such that long-term category demand is increased. Further, the applicability of this research extends beyond this study to benefit other retailers and other key Wisconsin consumer product sectors such as milk, fruit, and paper manufacturers.

6. Why are Our Cranberries Rotting in the Field?

The goal of this project was to quantitatively and qualitatively compare the pathogens associated with cranberry fruit rot in newer upland and traditional lowland marshes. The project results will be incorporated into informational booklets to be distributed to cranberry producers. In addition, the results will be useful in helping cranberry producers select fungicidal interventions that will be most effective in reducing cranberry rot.

7. Precast Concrete Foundation Systems for Buildings.

The goal of this project was to help complete the engineering development of a new rapidly erected prefabricated concrete basement wall/foundation system for residential housing. The project successfully addressed several problems in the production and erection of precast concrete wall sections. As a result, a Wisconsin manufacturer was able to develop and bring this product to market.

8. Effects of Canola in Rotation with Potatoes.

The goal of this study was to quantify the potential benefits of growing canola versus a standard pre-potato crop. In the first phase of this project, it was shown that canola is no less effective than sweet corn as a rotation crop. In the second phase, the experiment will be re-run in fields with higher levels of pathogen and longer-established canola. It is expected that the canola will demonstrate better suppression of pathogens that affect potatoes.

9. Ultrasound Assessment of Marbling Prior to Electronic Marketing of Live Cattle.

The objective of this project was to evaluate the accuracy of ultrasound and image analysis technology for categorization of finished cattle into USDA quality grades. The level of accuracy of categorization with the experimental protocol has reached 75%, which may improve when the testing of the indices used in the experiment is completed. The testing of indices is being conducted in collaboration with researchers in Medical Physics.

10. In-Process Characterization of Foamed Polymers Using Ultrasound Waves.

The objective of this research is to explore the applications of ultrasound waves in polymer characterization during foam extrusion processes. Ultrasound waves were successfully used to measure

variation in foam and polymer densities in response to changes in production parameters. Upon completion of shop floor tests, the process will be marketed and licensed. It is anticipated that this technology will benefit Wisconsin manufacturers by allowing for maintenance of quality at increased rates of production.

11. Development of a Non-Heating Pasteurization System for Beverage Processes.

The goal of this project was to assess the feasibility of micro-bubble pasteurization. This technique offers several advantages over the traditional method of heat pasteurization, including pasteurization and carbonization in a single step, preservation of taste quality, and lower energy consumption. The results from this project demonstrate that the new technology improves quality and lowers production costs. The next step will be the development of a complete production prototype.

12. Nonlinear PID Control for the Paper Industry.

Experimental results demonstrate the NPID control can achieve improved performance in several aspects of servo control. Tracking error was reduced by a factor of about 60%, eliminated overshoot and reduced base-line time. The application of this technology in the paper industry remains uncertain, but the researchers continue to discuss applications with Rockwell's engineers.

13. Automatic Occupancy Sensing and Assessment for the Prevention of Automobile Airbag Injuries.

The goal of this project is to develop sensors that can detect and assess the driver and passenger presence, size and location in the front seat of an automobile. The project is aimed at helping the automotive industry meet airbag deployment requirements. The prototype detection system developed in this project operates with 95% accuracy. The prototype is being developed for commercial application.

14. Electrodeposition Method Applied to Slip Casting and Investment Casting.

The goal of this project was to determine the feasibility of a new technology for greatly accelerating the production time for investment casting. The experimentation process allowed researchers to overcome several significant production problems. The next step in the research will be the assessment of casts made with the new molds. While some refinement in the process remains to be done, a patent is being sought for the new casting technology.

15. Specification and Development of Compatible Package Materials and Adhesives for Zipper Applications.

The goal of this project was to test design and materials variables in the production of zippers. The project subjected zippers to a number of tests, including vibration, drop, pull and temperature variation. to determine which designs and materials yielded the best zipper function. The project worked well to meet manufacturer objectives and served to promote university-industry connections.

2000-2001

1. Estimating First Crop Alfalfa Quality.

The objective of this project was to compare the performance of three different methods predictive equations for alfalfa quality, growing degree days, and scissors clipping for estimating quality of first cutting alfalfa. The original project was extended over an additional year to strengthen the final results. When completed, this work has the potential to impact all of Wisconsin's dairy farmers by helping to harvest higher quality feed.

2. Wireless Communication System for Enhancing Power Distribution System Reliability.

The objectives of this project were to develop and evaluate a wireless communication strategy for improving power distribution reliability. Results of this project include a ten-fold improvement in the synchronization algorithm, and have produced important insights into methods for examining wireless sensor and control networks. This project has provided a foundation for development of commercial applications.

3. Optimizing the Manufacture of Plastics using Computer Simulations.

The objective of this project was to develop techniques for simulating flow of plastic during the injection molding process. The project was successful in simulating plastic flow during molding for industrial components. The experimental setup to test plastic flow theories for next-generation simulations has also been completed. The project enhanced the capabilities of the Polymer Processing Laboratory at UW-Milwaukee, which is now ready to do further research for companies involved with plastics in the state of Wisconsin.

4. Characterizing ITO Growth on SiO₂ and Polyester Using Microwave Plasma Assisted Electron Beam Evaporation Deposition.

The objective of this project were to investigate the physical properties of ITO growth, and their electrical properties on polyester. The results of this project will enable the production of a thin film that is highly transmissive, durable, and conductive. A patent is being sought for this technology prior to commercialization.

5. Development of A Novel Molecular Technique (MAP Assay) for Diagnosis of Johne's Disease.

The objective of this proposal was the development and evaluation of a assay for the rapid and reliable diagnosis of Johne's disease, which affects dairy cattle. Testing methodology was developed that identify the disease pathogens with an overall efficiency rate of 97%. Information from this study will be important to veterinary diagnosticians who are responsible for controlling the spread of Johnes' disease in the Wisconsin diary industry.

6. A Variable Structure Control System for Unified Power Flow Controller.

The objective of this project was to propose and design a new type of power flow control system that has a robust response with respect to system disturbances and is able to coordinate with existing system controls.

The project successfully developed and tested two prototype control systems in simulation, both of which promise to increase efficiency of power transmission. These prototypes have been shared with Cooper Power Systems and Wisconsin Electric for further evaluation.

7. Assessment of Milk Quality and Economics of Automatic (Robotic) Milking Systems.

The objective of this research is to evaluate the economic benefits of robotic milking systems for small- to mid-sized dairy farms in Wisconsin. Project results will detail the performance of the robotic system including the milk quality history, accuracy of the automatic milking system in identifying abnormal milk and mastitis, and the number of milkings per day using different management strategies.

8. Brazzein: A Natural, Low-Calorie Sweetener.

The object of the project was to isolate and characterize the molecular determinants of sweetness, and to improve the production strategy for the protein. The project successfully evaluated brazzein variants to identify sweetness determinants. Research on this project will continue, with the goal of patenting and licensing the technology for commercial use.

9. Using Geographic Information System Technology to Predict and Mitigate Wolf Depredation on Livestock in Wisconsin.

The objectives of this project were to identify key factors that make certain farms and/or subcounties vulnerable to wolf depredation on livestock, to forecast future conflict based on wolf population growth projections, and establish management goals for certain areas. Project data show that areas with a mix of forest and pasture are more vulnerable than heavily forested or widely cleared regions. The Wisconsin DNR is using these results to develop problem animal control policies that will allow local landholders greater latitude in defending their livestock.

10. Why are our cranberries rotting in the field?

The objectives of this project were to continue comparison fruit rot pathogens found in newer upland and traditional lowland cranberry marshes and to evaluate methods for sampling fruit rot pathogens. Findings of the research project indicate no long-term differences in pathology between upland and traditional marshes, and have identified the active pathogens leading to cranberry rot. These findings will be useful to cranberry producers in choosing fungicides to reduce the incidence of rot.

11. The Application of Liquid Crystal Display Technology to the Rapid Identification of Viruses.

This project investigated adaptation of a new technology that utilizes liquid crystal display technology coupled with nanostructured surfaces to the detection and identification of viruses. The project succeeded in identifying the best elastomeric materials for use in diagnostics, producing the surfaces with nanostructure, and developing a protocol for binding monoclonal antibodies to these surfaces. The results of this project is a technology that is currently being licensed for commercial application.

Appendix A

Industrial & Economic Development Awards (UIR) 1999-2000

The number in column 1 refers to the number of the project description.

| | Principal Investigator | Project | Department | |
|----|------------------------|---|----------------------------------|----------|
| 1 | Lynn Allen-Hoffmann | Use of Human NIKS Cells to Assay for Effects of Topical Agents on Cutaneous Barrier Function | Pathology & Laboratory Medicine | \$5,600 |
| 2 | Alan Attie | A Transgenic Treatment for Fatty Liver in Dairy Cows | Biochemistry | \$26,300 |
| 3 | Robert Auerbach | Assays for Angiogenesis | Zoology | \$18,869 |
| 4 | Paul Bach-y-Rita | Universal Man-Machine Interface via the Tongue | Rehabilitation Medicine | \$27,910 |
| 5 | David Beebe | Microfluidic Systems for Improved DNA Transfection/Infection Processes | Biomedical Engineering | \$3,500 |
| 6 | Y. Austin Chang | Improved Casting Simulation Software for Foundry Industry | Materials Science & Engineering | \$21,650 |
| 7 | Sherry Combs | Immuno-assay analysis of lead in soil | Soil Science | \$27,000 |
| 8 | Charles Czuprynski | DNA Vaccination Against Bacterial Pneumonia in Cattle | Pathobiological Sciences | \$23,888 |
| 9 | Benjamin Darien | Signaling Functions of P-Selectin Regulation of MAP Kinase Activation | Medical Sciences | \$23,600 |
| 10 | Juan de Pablo | Stabilization and Preservation of Skin Cells and Tissue | Chemical Engineering | \$15,500 |
| 11 | Ian Duncan | The use of minocycline to prevent the development of experimental allergic encephalomyelitis: a model for MS treatment. | Medical Sciences | \$16,913 |
| 12 | Helen Harrison | Development of species specific PCR band markers in ginseng | Horticulture | \$25,000 |
| 13 | Noah Hershkowitz | Improved Polyimide Sheet Etching | Engineering Physics | \$30,000 |
| 14 | J. Jeffrey Inman | Increasing Demand for Wisconsin Consumer Products Through More Effective Quantity-Related Promotion Design | Katz Graduate School of Business | \$15,208 |
| 15 | LiLi Ji | Ginseng as a Potential Antioxidant | Kinesiology | \$25,000 |
| 16 | Ronald Kalil | Neural stem cell transplantation in the injured brain | Neuroscience | \$34,922 |
| 17 | Yoshihiro Kawaoka | Efficient generation of influenza virus vectors | Pathobiological Sciences | \$34,328 |
| 18 | Brian Kay | Constructing a Plant Antioime | Pharmacology | \$28,000 |

| | | | | |
|-------------------------------|------------------|---|---------------------------------|-----------|
| 19 | Max Lagally | High-Speed Sensor Module for Atomic Force Microscopy | Materials Science & Engineering | \$29,167 |
| 20 | Patricia McManus | Why Are Our Cranberries Rotting in the Field? | Plant Pathology | \$30,000 |
| 21 | Albee Messing | Transgenic Bioassay for Neurotoxicology Screening | Pathobiological Sciences | \$25,678 |
| 22 | Jae Park | Development of Chromium Recovery Technology for Leather Industries | Civil & Environ Engineering | \$28,942 |
| 23 | Jess Reed | Potential of flavonoid nutraceuticals in cranberries and cranberry products | Animal Sciences | \$23,000 |
| 24 | Jess Reed | The Effects of Cranberry Flavonoids on the Expression of Cell Adhesion Molecules In Vitro and In Familial Hypercholesterolemic (FH) Swine | Animal Sciences | \$4,000 |
| 25 | Anand Sanadi | Highly Filled Formaldehyde-Free Renewable Fiber Thermoplastic Composites | Biological Systems Engineering | \$25,700 |
| 26 | Ronald Schuler | Soil Moisture and Strength Sensing System for Precision Agriculture | Biological Systems Engineering | \$26,012 |
| 27 | Leyuan Shi | Flexible Resource Scheduling in Production Systems | Industrial Engineering | \$20,242 |
| 28 | Dean Tompkins | Coupling Photocatalysis with Electromagnetic Energy for the Enhanced Degradation of Organic Contaminants | Civil & Environ Engineering | \$22,536 |
| 29 | Karl Voelkerding | Novel DNA Technology for Genetic Diagnosis | Gene Insight | \$21,978 |
| 30 | Jeffrey Wyman | Area-Wide Management of Vegetable Production Crops using GPS and GIS Technology | Entomology | \$5,000 |
| 31 | John Yin | Anti-viral strategies that resist viral escape | Chemical Engineering | \$14,750 |
| Total awarded in FY 1999-2000 | | | | \$680,193 |

Appendix B

Industrial & Economic Development Awards (UIR) 2000-2001

The number in column 1 refers to the number of the project description.

| | | | | |
|----|---------------------|---|-----------------------------------|----------|
| 32 | Daniel Albert | Vitamin D Analogs in the Treatment of Mouse Models of Retinoblastoma | Ophthalmology & Visual Sciences | \$18,094 |
| 1 | Lynn Allen-Hoffmann | Use of Human NIKS Cells to Assay for Effects of Topical Agents on Cutaneous Barrier Function | Pathology & Laboratory Medicine | \$26,000 |
| 33 | Marc Anderson | Electronic Water Softeners Based on Nanoparticulate Pseudocapacitors | Civil & Environ Engineering | \$20,000 |
| 34 | Paul Bach-y-Rita | Tactile Feedback from a Surgical Catheter | Rehabilitation Medicine | \$7,165 |
| 5 | David Beebe | Microfluidic Systems for Improved DNA Transfection/Infection Processes | Biomedical Engineering | \$27,792 |
| 35 | Daniel Botez | Extreme high-power (>1W) single-mode semiconductor diode lasers | Electrical & Computer Engineering | \$13,600 |
| 36 | Leslie Cooperband | Fox River Valley Integrated Waste Management Project | Soil Science | \$29,800 |
| 37 | Albert Ellingboe | Mapping, cloning of rice resistant to M. grisea; analyses of transformed strains of M. grisea. | Plant Pathology | \$18,000 |
| 38 | Awad Hanna | Feasibility Study of Reuse and Recycling Construction Materials from Badger Army Ammunition Plant | Civil & Environ Engineering | \$26,792 |
| 30 | Richard Hartel | Development of CO ₂ -Based Popping Products | Food Science | \$21,725 |
| 40 | F. Michael Hoffmann | Gene Targeting of Smad3 in NIKS Human Keratinocytes | Oncology | \$22,950 |
| 41 | Guilherme Indig | Characterization of Antineoplastic Activity of Crystal Violet Derivatives | Pharmacy | \$7,305 |
| 42 | Gary Jackson | Developing and Pilot Testing an Environmental Management Assessment System for Wisconsin's Dairy Industry | Soil Science/ERC | \$26,200 |
| 43 | Eric Johnson | Improvements in Expression Systems for Clostridial Proteins | Food Microbiol & Toxicology | \$33,900 |
| 44 | Max Lagally | Miniature, Micromachined Positioning Devices with Sub-Nanometer Resolution | Materials Science & Engineering | \$30,000 |
| 45 | Paul Lambert | A Novel Clinical Screening Method for Human Papillomaviruses that Cause Cervical Cancer | Oncology | \$30,000 |
| 20 | Patricia McManus | Why are our cranberries rotting in the field? | Plant Pathology | \$23,315 |

| | | | | |
|-------------------------------|--------------------|--|--------------------------------|-----------|
| 46 | Christopher Murphy | Rapid detection of virus using liquid crystal technology | Surgical Sciences | \$25,866 |
| 47 | Daniel Noguera | Identification of Nutrient Removal Bacteria in ORBAL Wastewater Treatment Plants | Civil & Environ Engineering | \$23,500 |
| 48 | Thomas Osborn | Genetic engineering of male-sterile alfalfa | Agronomy | \$10,400 |
| 49 | John Pfothenhauer | Improved Cryocoolers for X-Ray Detectors Using Shape Memory Alloys of Titanium Nickel | Mechanical Engineering | \$35,528 |
| 50 | Robert Radwin | Factors affecting the breaking and bending forces of corrugated fiberboard inserts and containers during setup and closure | Biomedical Engineering | \$21,947 |
| 51 | Douglas Reinemann | Assessment of Milk Quality and Economics of Automatic (Robotic) Milking Systems | Biological Systems Engineering | \$15,296 |
| 52 | Leyuan Shi | Transportation: Planning and Scheduling | Industrial Engineering | \$22,317 |
| 53 | Ross Swaney | OA Pulping Process for Energy Reduction in Papermaking | Chemical Engineering | \$14,491 |
| 54 | Ross Swaney | Technical and Economic Feasibility of Fungal Pretreatment of Wood Chips for Sulfite Pulping | Chemical Engineering | \$32,500 |
| 55 | Bruce Thomadsen | Development of a Device to Implant Radioactive Sources for Prostate Cancer | Medical Physics | \$33,800 |
| 31 | John Yin | Anti-viral strategies that resist viral escape | Chemical Engineering | \$14,750 |
| Total awarded in FY 2000-2001 | | | | \$633,033 |

Appendix C

Applied Research Program Awards 1999-2000

| <u>Principal Investigator</u> | <u>Campus</u> | <u>Award</u> | <u>Title</u> |
|-------------------------------|---------------|--------------|---|
| Kim W. Pierson | UW-Eau Claire | \$37,645 | <i>Enhanced Development of Semiconductor Devices and Materials Using Transmission Electron Microscopy</i> |
| R.C. Viadero Jr. | UW-Green Bay | \$37,654 | <i>Removal of Fine Particulate Matter From Intensive Recirculating Aquaculture Systems Using Microfiltration</i> |
| Alan D. Attie | UW-Madison | \$20,112 | <i>Production of Transgenic Dairy Cows Resistant to Fatty Liver</i> |
| Jo Handelsman | UW-Madison | \$29,023 | <i>Enhancing the Safety of Bacteria for Registration as Crop Inoculants</i> |
| J. Jeffrey Inman | UW-Madison | \$13,567 | <i>Increasing Demand for Wisconsin Consumer Products Through More Effective Quantity-Related Promotion Design</i> |
| Patricia S. McManus | UW-Madison | \$30,486 | <i>Why Are Our Cranberries Rotting In The Field?</i> |
| Michael G. Oliva | UW-Madison | \$11,946 | <i>Precast Concrete Foundation Systems for Buildings</i> |
| Thomas C. Osborn | UW-Madison | \$10,009 | <i>Effects of Canola in Rotation with Potatoes</i> |
| Daniel M. Schaefer | UW-Madison | \$22,511 | <i>Ultrasound Assessment of Marbling Prior to Electronic Marketing of Live Cattle</i> |
| Nidal H. Abu-Zahra | UW-Milwaukee | \$33,624 | <i>In-Process Characterization of Foamed Polymers Using Ultrasound Waves</i> |
| Ryo Samuel Amano | UW-Milwaukee | \$37,662 | <i>Development of a Non-Heating Pasteurization System for Beverage Processes</i> |
| Brian Armstrong | UW-Milwaukee | \$34,303 | <i>Nonlinear PID Control for the Paper Industry</i> |

| | | | |
|----------------------------|--------------|----------|--|
| Jun Zhang | UW-Milwaukee | \$39,136 | <i>Automatic Occupancy Sensing and Assessment for the Prevention of Automobile Airbag Injuries</i> |
| Mary Orfield | UW-Stout | \$27,930 | <i>Electrodeposition Method Applied to Slip Casting and Investment Casting</i> |
| Claire Koelsch Sand | UW-Stout | \$40,051 | <i>Specification and Development of Compatible Package Materials and Adhesives for Zipper Applications</i> |

Appendix D

Applied Research Program Research Awards 2000-01

| <u>Principal Investigator</u> | <u>Campus</u> | <u>Award</u> | <u>Title</u> |
|--------------------------------------|----------------------|---------------------|--|
| Dennis Cosgrove | UW-River Falls | \$18,317 | <i>Estimating First Crop Alfalfa Quality</i> |
| Ivan Howitt | UW-Milwaukee | \$46,316 | <i>Wireless Communication System for Enhancing Power Distribution System Reliability</i> |
| Krishna M. Pillai | UW-Milwaukee | \$42,615 | <i>Optimizing the Manufacture of Plastics using Computer Simulations</i> |
| Lian Li | UW-Milwaukee | \$43,425 | <i>Characterizing ITO Growth on SiO₂ and Polyester Using Microwave Plasma Assisted Electron Beam Evaporation Deposition</i> |
| Sandra McLellan | UW-Milwaukee | \$42,693 | <i>Development of A Novel Molecular Technique (MAP Assay) for Diagnosis of Johne's Disease</i> |
| David C. Yu | UW-Milwaukee | \$49,926 | <i>A Variable Structure Control System for Unified Power Flow Controller</i> |
| Douglas J. Reinemann | UW-Madison | \$22,486 | <i>Assessment of Milk Quality and Economics of Automatic (Robotic) Milking Systems</i> |
| John L. Markley | UW-Madison | \$46,779 | <i>Brazzein: A Natural, Low-Calorie Sweetener</i> |
| Lisa Naughton | UW-Madison | \$24,906 | <i>Using Geographic Information System Technology to Predit and Mitigate Wolf Depredation on Lifestock in Wisconsin</i> |
| Patricia McManus | UW-Madison | \$44,210 | <i>Why Are Our Cranberries Rotting In The Field?</i> |
| Barbara A. Israel | UW-Madison | \$49,685 | <i>The Application of Liquid Crystal Display Technology to the Rapid Identification of Viruses</i> |

I.2. Business and Finance Committee

Thursday, November 8, 2001
1820 Van Hise Hall
1:00 p.m.

10:30 a.m. All Regents - 1820 Van Hise Hall

- Resources: Federal Funding Strategy
- Quality: Learning Innovations Update
- Quality: UW Systemwide Information Technology Plan

12:00 p.m. Andrew Porter: Professor of Education and Education Psychology at UW-Madison

- High School Graduation Testing

1:00 p.m. Joint with Physical Planning and Funding

- a. Building Our Resource Base
 - (1) Trends in Gifts, Grants and Contracts
 - (2) Fund-Raising Strategy

2:00 p.m. or upon conclusion of joint session

- b. Technology Transfer Initiative: WiSys Update
- c. Committee Business
 - (1) Approval of Minutes of October 4, 2001 meeting
 - (2) Annual Gift-in-Kind Report
 - (3) Quarterly Gifts, Grants and Contracts
- d. Trust Funds
 - (1) Investment Guidelines Related to Annual Meetings with Managers
[Resolution I.2.d.(1)]
- e. Report of the Vice President
- f. Closed Session to consider trust matters as permitted by s.19.85(1)(e), *Wis. Stats.*

3:30 p.m. 4151 Grainger Hall, Directors Room

- g. Public Forum on Trust Fund Investments

November 9, 2001

I.2.c.(2)

Annual Gifts-in-Kind Report
August 2000 – July 2001
Can be obtained by contacting
The Board of Regents Office

Phone: 608-262-2324
Fax: 608-262-5739

UNIVERSITY OF WISCONSIN SYSTEM
 GIFTS, GRANTS AND CONTRACTS AWARDED
 QUARTERLY REPORT & PRIOR-YEAR COMPARISON
 FISCAL YEAR 2001-2002 - First Quarter

| FISCAL YEAR 2000-2001 | Extension | Instruction | Libraries | Misc | Phy Plt | Research | Student Aid | Total |
|------------------------------|--------------------|--------------------|--------------------|--------------------|---------------------|---------------------|-------------------|---------------------|
| Total | 12,497,502 | 19,760,058 | 286,059 | 32,588,845 | 2,576,124 | 182,996,168 | 53,699,034 | 304,403,789 |
| Federal | 8,904,960 | 16,608,435 | 200,000 | 10,958,666 | 0 | 130,770,600 | 49,056,848 | 216,499,509 |
| Nonfederal | 3,592,542 | 3,151,623 | 86,059 | 21,630,179 | 2,576,124 | 52,225,568 | 4,642,185 | 87,904,280 |
| FISCAL YEAR 1999-2000 | | | | | | | | |
| Total | 18,122,972 | 21,249,813 | 1,559,957 | 31,806,315 | 16,428,069 | 195,218,943 | 49,646,411 | 334,032,481 |
| Federal | 12,224,565 | 16,840,960 | 287,500 | 8,214,049 | 573,369 | 138,845,025 | 45,044,887 | 222,030,355 |
| Nonfederal | 5,898,407 | 4,408,853 | 1,272,457 | 23,592,266 | 15,854,700 | 56,373,918 | 4,601,525 | 112,002,126 |
| INCREASE(DECREASE) | | | | | | | | |
| Total | (5,625,470) | (1,489,755) | (1,273,898) | 782,530 | (13,851,945) | (12,222,775) | 4,052,622 | (29,628,691) |
| Federal | (3,319,605) | (232,525) | (87,500) | 2,744,617 | (573,369) | (8,074,425) | 4,011,962 | (5,530,845) |
| Nonfederal | (2,305,865) | (1,257,230) | (1,186,398) | (1,962,087) | (13,278,576) | (4,148,350) | 40,661 | (24,097,846) |

UNIVERSITY OF WISCONSIN SYSTEM
 GIFTS, GRANTS AND CONTRACTS AWARDED - BY INSTITUTION
 QUARTERLY REPORT & PRIOR-YEAR COMPARISON
 FISCAL YEAR 2001-2002 - First Quarter

| | Extension | Instruction | Libraries | Misc | Phy Plt | Research | Student Aid | Total |
|------------------------------|-------------------|-------------------|----------------|-------------------|------------------|--------------------|-------------------|--------------------|
| FISCAL YEAR 2001-2002 | | | | | | | | |
| Madison | 3,834,080 | 7,595,940 | 268,707 | 24,207,544 | 2,284,125 | 172,503,329 | 10,743,566 | 221,437,291 |
| Milwaukee | 89,230 | 5,446,087 | 3,144 | 1,116,206 | 0 | 4,733,391 | 7,400,910 | 18,788,968 |
| Eau Claire | 688,600 | 1,074,962 | 0 | 0 | 0 | 59,049 | 3,901,898 | 5,724,509 |
| Green Bay | 0 | 345,254 | 0 | 69,225 | 291,999 | 192,730 | 2,066,343 | 2,965,551 |
| La Crosse | 1,890,718 | 640,432 | 0 | 929,792 | 0 | 2,525,894 | 4,029,310 | 10,016,146 |
| Oshkosh | 3,583,292 | 1,881,420 | 0 | 0 | 0 | 171,391 | 2,919,909 | 8,556,012 |
| Parkside | 177,136 | 165,681 | 0 | 116,760 | 0 | 553,571 | 3,573,873 | 4,587,021 |
| Platteville | 16,000 | 0 | 0 | 393,070 | 0 | 0 | 2,108,491 | 2,517,561 |
| River Falls | 56,646 | 121,868 | 0 | 1,280,703 | 0 | 9,446 | 2,132,871 | 3,601,534 |
| Stevens Point | 494,142 | 62,732 | 0 | 5,000 | 0 | 1,350,572 | 3,925,560 | 5,838,006 |
| Stout | 983,814 | 81,482 | 0 | 910,902 | 0 | 820,022 | 3,599,529 | 6,395,749 |
| Superior | 0 | 0 | 5,000 | 683,911 | 0 | 1,439 | 1,132,967 | 1,823,317 |
| Whitewater | 0 | 6 | 0 | 2,397,128 | 0 | 75,334 | 2,913,806 | 5,386,274 |
| Colleges | 1,000 | 549,461 | 9,208 | 178,580 | 0 | 0 | 3,250,000 | 3,988,249 |
| Extension | 682,844 | 0 | 0 | 300,025 | 0 | 0 | 0 | 982,869 |
| System-Wide | 0 | 1,794,733 | 0 | 0 | 0 | 0 | 0 | 1,794,733 |
| Totals | 12,497,502 | 19,760,058 | 286,059 | 32,588,845 | 2,576,124 | 182,996,168 | 53,699,034 | 304,403,789 |
| Madison | 2,235,255 | 4,912,395 | 200,000 | 4,525,186 | 0 | 122,178,025 | 7,382,052 | 141,432,913 |
| Milwaukee | 0 | 5,256,042 | 0 | 299,784 | 0 | 3,634,803 | 7,238,112 | 16,428,741 |
| Eau Claire | 640,750 | 1,074,962 | 0 | 0 | 0 | 23,576 | 3,901,898 | 5,641,186 |
| Green Bay | 0 | 303,894 | 0 | 0 | 0 | 186,230 | 2,045,314 | 2,535,438 |
| La Crosse | 1,706,098 | 640,432 | 0 | 808,721 | 0 | 2,137,521 | 4,029,310 | 9,322,082 |
| Oshkosh | 2,827,292 | 1,877,874 | 0 | 0 | 0 | 96,458 | 2,919,909 | 7,721,533 |
| Parkside | 177,136 | 95,602 | 0 | 111,750 | 0 | 537,489 | 3,558,809 | 4,480,786 |
| Platteville | 0 | 0 | 0 | 323,628 | 0 | 0 | 2,108,491 | 2,432,119 |
| River Falls | 10,880 | 99,844 | 0 | 1,105,545 | 0 | 4,946 | 2,112,192 | 3,333,407 |
| Stevens Point | 12,240 | 558 | 0 | 5,000 | 0 | 1,103,020 | 3,925,560 | 5,046,378 |
| Stout | 921,764 | 69,676 | 0 | 833,057 | 0 | 793,198 | 3,599,529 | 6,217,224 |
| Superior | 0 | 0 | 0 | 683,911 | 0 | 0 | 1,132,967 | 1,816,878 |
| Whitewater | 0 | 0 | 0 | 2,262,084 | 0 | 75,334 | 2,902,706 | 5,240,124 |
| Colleges | 0 | 482,423 | 0 | 0 | 0 | 0 | 2,200,000 | 2,682,423 |
| Extension | 373,545 | 0 | 0 | 0 | 0 | 0 | 0 | 373,545 |
| System-Wide | 0 | 1,794,733 | 0 | 0 | 0 | 0 | 0 | 1,794,733 |
| Federal Totals | 8,904,960 | 16,608,435 | 200,000 | 10,958,666 | 0 | 130,770,600 | 49,056,848 | 216,499,509 |
| Madison | 1,598,825 | 2,683,545 | 68,707 | 19,682,358 | 2,284,125 | 50,325,304 | 3,361,514 | 80,004,378 |
| Milwaukee | 89,230 | 190,045 | 3,144 | 816,422 | 0 | 1,098,588 | 162,799 | 2,360,227 |
| Eau Claire | 47,850 | 0 | 0 | 0 | 0 | 35,473 | 0 | 83,323 |
| Green Bay | 0 | 41,360 | 0 | 69,225 | 291,999 | 6,500 | 21,029 | 430,113 |
| La Crosse | 184,620 | 0 | 0 | 121,071 | 0 | 388,373 | 0 | 694,064 |
| Oshkosh | 756,000 | 3,546 | 0 | 0 | 0 | 74,933 | 0 | 834,479 |
| Parkside | 0 | 70,079 | 0 | 5,010 | 0 | 16,082 | 15,064 | 106,235 |
| Platteville | 16,000 | 0 | 0 | 69,442 | 0 | 0 | 0 | 85,442 |
| River Falls | 45,766 | 22,024 | 0 | 175,158 | 0 | 4,500 | 20,679 | 268,127 |
| Stevens Point | 481,902 | 62,174 | 0 | 0 | 0 | 247,552 | 0 | 791,628 |
| Stout | 62,050 | 11,806 | 0 | 77,845 | 0 | 26,824 | 0 | 178,525 |
| Superior | 0 | 0 | 5,000 | 0 | 0 | 1,439 | 0 | 6,439 |
| Whitewater | 0 | 6 | 0 | 135,044 | 0 | 0 | 11,100 | 146,150 |
| Colleges | 1,000 | 67,038 | 9,208 | 178,580 | 0 | 0 | 1,050,000 | 1,305,826 |
| Extension | 309,299 | 0 | 0 | 300,025 | 0 | 0 | 0 | 609,324 |
| System-Wide | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Nonfederal Totals | 3,592,542 | 3,151,623 | 86,059 | 21,630,179 | 2,576,124 | 52,225,568 | 4,642,185 | 87,904,280 |

UNIVERSITY OF WISCONSIN SYSTEM
 GIFTS, GRANTS AND CONTRACTS AWARDED - BY INSTITUTION
 QUARTERLY REPORT & PRIOR-YEAR COMPARISON
 FISCAL YEAR 2001-2002 - First Quarter

| | Extension | Instruction | Libraries | Misc | Phy Plt | Research | Student Aid | Total |
|------------------------------|-------------------|-------------------|------------------|-------------------|-------------------|--------------------|-------------------|--------------------|
| FISCAL YEAR 2000-2001 | | | | | | | | |
| Madison | 5,793,886 | 9,207,766 | 1,544,807 | 23,791,273 | 16,221,929 | 185,880,751 | 14,652,344 | 257,092,756 |
| Milwaukee | 0 | 5,222,647 | 0 | 1,837,247 | 0 | 5,659,589 | 6,500,181 | 19,219,664 |
| Eau Claire | 453,353 | 1,078,351 | 0 | 0 | 0 | 749,426 | 18,830 | 2,299,960 |
| Green Bay | 2,000 | 1,026,503 | 15,150 | 90,444 | 195,500 | 74,107 | 1,764,313 | 3,168,017 |
| La Crosse | 529,949 | 642,000 | 0 | 1,569,490 | 0 | 1,208,379 | 4,180,947 | 8,130,765 |
| Oshkosh | 3,052,744 | 1,132,733 | 0 | 0 | 0 | 283,021 | 2,810,139 | 7,278,637 |
| Parkside | 177,136 | 95,602 | 0 | 111,751 | 0 | 537,489 | 3,180,582 | 4,102,560 |
| Platteville | 36,921 | 20,899 | 0 | 0 | 0 | 0 | 1,965,865 | 2,023,685 |
| River Falls | 311,436 | 332,149 | 0 | 1,012,042 | 0 | 36,878 | 2,004,271 | 3,696,777 |
| Stevens Point | 432,697 | 233,905 | 0 | 231,515 | 0 | 560,284 | 3,720,445 | 5,178,846 |
| Stout | 1,151,817 | 139,516 | 0 | 634,789 | 10,640 | 12,096 | 3,473,891 | 5,422,749 |
| Superior | 0 | 702,428 | 0 | 0 | 0 | 73,800 | 609,000 | 1,385,228 |
| Whitewater | 0 | 78,750 | 0 | 1,841,971 | 0 | 122,907 | 2,341,097 | 4,384,725 |
| Colleges | 1,010 | 81,914 | 0 | 504,809 | 0 | 20,216 | 2,349,506 | 2,957,455 |
| Extension | 6,180,023 | 0 | 0 | 153,318 | 0 | 0 | 0 | 6,333,341 |
| System-Wide | 0 | 1,254,650 | 0 | 27,666 | 0 | 0 | 75,000 | 1,357,316 |
| Totals | 18,122,972 | 21,249,813 | 1,559,957 | 31,806,315 | 16,428,069 | 195,218,943 | 49,646,411 | 334,032,481 |
| Madison | 4,909,960 | 5,876,139 | 287,500 | 2,580,916 | 562,729 | 132,169,135 | 10,893,808 | 157,280,187 |
| Milwaukee | 0 | 4,786,847 | 0 | 1,025,626 | 0 | 4,117,872 | 6,355,055 | 16,285,400 |
| Eau Claire | 416,948 | 1,053,351 | 0 | 0 | 0 | 737,589 | 18,830 | 2,226,718 |
| Green Bay | 2,000 | 976,428 | 0 | 0 | 0 | 44,097 | 1,758,721 | 2,781,246 |
| La Crosse | 378,141 | 627,875 | 0 | 708,206 | 0 | 1,043,692 | 4,179,310 | 6,937,224 |
| Oshkosh | 2,722,042 | 999,787 | 0 | 0 | 0 | 78,021 | 2,810,139 | 6,609,989 |
| Parkside | 160,061 | 12,500 | 0 | 0 | 0 | 528,367 | 3,179,013 | 3,879,941 |
| Platteville | 7,866 | 0 | 0 | 0 | 0 | 0 | 1,965,865 | 1,973,731 |
| River Falls | 311,436 | 321,684 | 0 | 885,433 | 0 | 0 | 1,998,451 | 3,517,004 |
| Stevens Point | 0 | 69,665 | 0 | 231,515 | 0 | 0 | 3,720,445 | 4,021,625 |
| Stout | 1,119,080 | 86,258 | 0 | 591,355 | 10,640 | 3,500 | 3,360,633 | 5,171,466 |
| Superior | 0 | 695,028 | 0 | 0 | 0 | 0 | 609,000 | 1,304,028 |
| Whitewater | 0 | 78,750 | 0 | 1,739,995 | 0 | 122,752 | 2,315,872 | 4,257,369 |
| Colleges | 0 | 1,998 | 0 | 451,003 | 0 | 0 | 1,879,745 | 2,332,746 |
| Extension | 2,197,031 | 0 | 0 | 0 | 0 | 0 | 0 | 2,197,031 |
| System-Wide | 0 | 1,254,650 | 0 | 0 | 0 | 0 | 0 | 1,254,650 |
| Federal Totals | 12,224,565 | 16,840,960 | 287,500 | 8,214,049 | 573,369 | 138,845,025 | 45,044,887 | 222,030,355 |
| Madison | 883,926 | 3,331,627 | 1,257,307 | 21,210,357 | 15,659,200 | 53,711,616 | 3,758,536 | 99,812,569 |
| Milwaukee | 0 | 435,800 | 0 | 811,621 | 0 | 1,541,717 | 145,126 | 2,934,264 |
| Eau Claire | 36,405 | 25,000 | 0 | 0 | 0 | 11,837 | 0 | 73,242 |
| Green Bay | 0 | 50,075 | 15,150 | 90,444 | 195,500 | 30,010 | 5,592 | 386,771 |
| La Crosse | 151,808 | 14,125 | 0 | 861,284 | 0 | 164,687 | 1,637 | 1,193,541 |
| Oshkosh | 330,702 | 132,946 | 0 | 0 | 0 | 205,000 | 0 | 668,648 |
| Parkside | 17,075 | 83,102 | 0 | 111,751 | 0 | 9,122 | 1,569 | 222,619 |
| Platteville | 29,055 | 20,899 | 0 | 0 | 0 | 0 | 0 | 49,954 |
| River Falls | 0 | 10,465 | 0 | 126,609 | 0 | 36,878 | 5,820 | 179,773 |
| Stevens Point | 432,697 | 164,240 | 0 | 0 | 0 | 560,284 | 0 | 1,157,221 |
| Stout | 32,737 | 53,258 | 0 | 43,434 | 0 | 8,596 | 113,258 | 251,283 |
| Superior | 0 | 7,400 | 0 | 0 | 0 | 73,800 | 0 | 81,200 |
| Whitewater | 0 | 0 | 0 | 101,976 | 0 | 155 | 25,225 | 127,356 |
| Colleges | 1,010 | 79,916 | 0 | 53,806 | 0 | 20,216 | 469,761 | 624,709 |
| Extension | 3,982,992 | 0 | 0 | 153,318 | 0 | 0 | 0 | 4,136,310 |
| System-Wide | 0 | 0 | 0 | 27,666 | 0 | 0 | 75,000 | 102,666 |
| Nonfederal Totals | 5,898,407 | 4,408,853 | 1,272,457 | 23,592,266 | 15,854,700 | 56,373,918 | 4,601,525 | 112,002,126 |

UNIVERSITY OF WISCONSIN SYSTEM
GIFTS, GRANTS AND CONTRACTS AWARDED - BY INSTITUTION
QUARTERLY REPORT & PRIOR-YEAR COMPARISON
FISCAL YEAR 2001-2002 - First Quarter

| | Extension | Instruction | Libraries | Misc | Phy Plt | Research | Student Aid | Total |
|----------------------------|--------------------|--------------------|--------------------|--------------------|---------------------|---------------------|------------------|---------------------|
| INCREASE (DECREASE) | | | | | | | | |
| Madison | (1,959,806) | (1,611,826) | (1,276,100) | 416,271 | (13,937,804) | (13,377,422) | (3,908,778) | (35,655,465) |
| Milwaukee | 89,230 | 223,440 | 3,144 | (721,041) | 0 | (926,198) | 900,729 | (430,696) |
| Eau Claire | 235,247 | (3,389) | 0 | 0 | 0 | (690,377) | 3,883,068 | 3,424,549 |
| Green Bay | (2,000) | (681,249) | (15,150) | (21,219) | 96,499 | 118,623 | 302,030 | (202,466) |
| La Crosse | 1,360,769 | (1,568) | 0 | (639,698) | 0 | 1,317,515 | (151,637) | 1,885,381 |
| Oshkosh | 530,548 | 748,687 | 0 | 0 | 0 | (111,630) | 109,770 | 1,277,375 |
| Parkside | 0 | 70,079 | 0 | 5,009 | 0 | 16,082 | 393,291 | 484,461 |
| Platteville | (20,921) | (20,899) | 0 | 393,070 | 0 | 0 | 142,626 | 493,876 |
| River Falls | (254,790) | (210,281) | 0 | 268,661 | 0 | (27,432) | 128,600 | (95,242) |
| Stevens Point | 61,445 | (171,173) | 0 | (226,515) | 0 | 790,288 | 205,115 | 659,160 |
| Stout | (168,003) | (58,034) | 0 | 276,113 | (10,640) | 807,926 | 125,638 | 973,000 |
| Superior | 0 | (702,428) | 5,000 | 683,911 | 0 | (72,361) | 523,967 | 438,089 |
| Whitewater | 0 | (78,744) | 0 | 555,157 | 0 | (47,573) | 572,709 | 1,001,549 |
| Colleges | (10) | 467,547 | 9,208 | (326,229) | 0 | (20,216) | 900,494 | 1,030,794 |
| Extension | (5,497,179) | 0 | 0 | 146,707 | 0 | 0 | 0 | (5,350,472) |
| System-Wide | 0 | 540,083 | 0 | (27,666) | 0 | 0 | (75,000) | 437,417 |
| Totals | (5,625,470) | (1,489,755) | (1,273,898) | 782,530 | (13,851,945) | (12,222,775) | 4,052,622 | (29,628,691) |
| Madison | (2,674,705) | (963,744) | (87,500) | 1,944,270 | (562,729) | (9,991,110) | (3,511,756) | (15,847,274) |
| Milwaukee | 0 | 469,195 | 0 | (725,842) | 0 | (483,069) | 883,057 | 143,341 |
| Eau Claire | 223,802 | 21,611 | 0 | 0 | 0 | (714,013) | 3,883,068 | 3,414,468 |
| Green Bay | (2,000) | (672,534) | 0 | 0 | 0 | 142,133 | 286,593 | (245,808) |
| La Crosse | 1,327,957 | 12,557 | 0 | 100,515 | 0 | 1,093,829 | (150,000) | 2,384,858 |
| Oshkosh | 105,250 | 878,087 | 0 | 0 | 0 | 18,437 | 109,770 | 1,111,544 |
| Parkside | 17,075 | 83,102 | 0 | 111,750 | 0 | 9,122 | 379,796 | 600,845 |
| Platteville | (7,866) | 0 | 0 | 323,628 | 0 | 0 | 142,626 | 458,388 |
| River Falls | (300,556) | (221,840) | 0 | 220,112 | 0 | 4,946 | 113,741 | (183,597) |
| Stevens Point | 12,240 | (69,107) | 0 | (226,515) | 0 | 1,103,020 | 205,115 | 1,024,753 |
| Stout | (197,316) | (16,582) | 0 | 241,702 | (10,640) | 789,698 | 238,896 | 1,045,758 |
| Superior | 0 | (695,028) | 0 | 683,911 | 0 | 0 | 523,967 | 512,850 |
| Whitewater | 0 | (78,750) | 0 | 522,089 | 0 | (47,418) | 586,834 | 982,755 |
| Colleges | 0 | 480,425 | 0 | (451,003) | 0 | 0 | 320,255 | 349,677 |
| Extension | (1,823,486) | 0 | 0 | 0 | 0 | 0 | 0 | (1,823,486) |
| System-Wide | 0 | 540,083 | 0 | 0 | 0 | 0 | 0 | 540,083 |
| Federal Totals | (3,319,605) | (232,525) | (87,500) | 2,744,617 | (573,369) | (8,074,425) | 4,011,962 | (5,530,845) |
| Madison | 714,899 | (648,082) | (1,188,600) | (1,527,999) | (13,375,075) | (3,386,312) | (397,022) | (19,808,191) |
| Milwaukee | 89,230 | (245,755) | 3,144 | 4,801 | 0 | (443,129) | 17,673 | (574,037) |
| Eau Claire | 11,445 | (25,000) | 0 | 0 | 0 | 23,636 | 0 | 10,081 |
| Green Bay | 0 | (8,715) | (15,150) | (21,219) | 96,499 | (23,510) | 15,437 | 43,342 |
| La Crosse | 32,812 | (14,125) | 0 | (740,213) | 0 | 223,686 | (1,637) | (499,477) |
| Oshkosh | 425,298 | (129,400) | 0 | 0 | 0 | (130,067) | 0 | 165,831 |
| Parkside | (17,075) | (13,023) | 0 | (106,741) | 0 | 6,960 | 13,495 | (116,384) |
| Platteville | (13,055) | (20,899) | 0 | 69,442 | 0 | 0 | 0 | 35,488 |
| River Falls | 45,766 | 11,559 | 0 | 48,549 | 0 | (32,378) | 14,859 | 88,355 |
| Stevens Point | 49,205 | (102,066) | 0 | 0 | 0 | (312,732) | 0 | (365,593) |
| Stout | 29,313 | (41,452) | 0 | 34,411 | 0 | 18,228 | (113,258) | (72,758) |
| Superior | 0 | (7,400) | 5,000 | 0 | 0 | (72,361) | 0 | (74,761) |
| Whitewater | 0 | 6 | 0 | 33,068 | 0 | (155) | (14,125) | 18,794 |
| Colleges | (10) | (12,878) | 9,208 | 124,774 | 0 | (20,216) | 580,239 | 681,117 |
| Extension | (3,673,693) | 0 | 0 | 146,707 | 0 | 0 | 0 | (3,526,986) |
| System-Wide | 0 | 0 | 0 | (27,666) | 0 | 0 | (75,000) | (102,666) |
| Nonfederal Totals | (2,305,865) | (1,257,230) | (1,186,398) | (1,962,087) | (13,278,576) | (4,148,350) | 40,661 | (24,097,846) |

Investment Guidelines Related
to Annual Meetings with Managers

BUSINESS AND FINANCE COMMITTEE

Resolution:

That, upon recommendation of the Regent Business and Finance Committee, the practice of having each of the UW System Trust Funds' investment managers meet annually with the Committee, as provided for under Regent Policy 91-11, Investment Objectives and Guidelines, be delegated by the Business and Finance Committee to the Trust Officer and Assistant Trust Officers, with the proviso that the Trust Officer and Assistant Trust Officers regularly report to the Committee on the content of such meetings as a regular part of their investment oversight responsibilities; and, accordingly, that the following revision to the Investment Objectives and Guidelines be approved.

Reports (page 10-11)

Annual investment meetings (more frequently, as warranted) will be held with the **Committee Trust Officer and Assistant Trust Officers, the findings and contents of which will be regularly reported to the Committee.**

**UNIVERSITY OF WISCONSIN SYSTEM TRUST FUNDS
INVESTMENT GUIDELINES: REQUIREMENT TO MEET
ANNUALLY WITH MANAGERS**

EXECUTIVE SUMMARY

BACKGROUND

At the meeting of October 5, 2001, the Business and Finance Committee received a report indicating that the only established rule or policy which required the Committee to meet annually with each individual Trust Funds investment manager was embodied in the Trust Funds Investment Objectives and Guidelines (Regent Policy 91-11). Following a brief discussion, the Committee asked that Trust Funds staff draft a resolution delegating this responsibility to the Trust Officer and Assistant Trust Officers with the understanding that these Officers would regularly report on the findings and content of such meetings to the Committee.

REQUESTED ACTION

Approval of proposed changes to Investment Objectives and Guidelines for the University of Wisconsin System Trust Funds to reflect the delegation of annually meeting with investment managers from the Business and Finance Committee to the Trust Officer and Assistant Trust Officers.

DISCUSSION

No further discussion of this issue is called for.

RELATED REGENT POLICIES

Regent Policy 91-11 - Statement of Investment Objectives and Guidelines

I.3. Physical Planning and Funding Committee

Thursday, November 8, 2001
Room 1820 Van Hise Hall
1:00 p.m.

10:30 a.m. Board of Regents Meeting

- Resources: Federal Funding Strategy
- Quality: Learning Innovation Update
- Quality: UW Systemwide Information Technology Plan

12:00 p.m. Andrew Porter: Professor of Education and Education Psychology at UW-Madison

1:00 p.m. Joint Session with Business and Finance Committee / Room 1820

- Building Our Resource Base
 - (1) Trends in Gift and Grants
 - (2) Fund-Raising Strategy

Physical Planning Committee adjourns to Room 1511

- b. Approval of minutes of the October 4, 2001 meeting
- c. Report of the Assistant Vice President
 - Building Commission Actions
- d. Discussion of Systemwide 2003-09 Physical Planning Issues
- e. UW-Madison: Camp Randall Shell Addition Budget Increase
\$432,000 Program Revenue – Cash, Athletics
[Resolution I.3.e.]
- f. UW-Milwaukee: Sandburg Residence Hall Fire Protection System Addition (Design Report)
\$3,136,000 (\$80,000 Program Revenue – Cash and \$3,056,000 Program Revenue Supported
Borrowing)
[Resolution I.3.f.]
- g. UW-Stout: Parking Lot Development
\$208,810 Program Revenue Supported Borrowing-Parking
[Resolution I.3.g.]
- h. UW-Superior: Aquaculture Land Use Agreement
[Resolution I.3.h.]
- x. Additional items which may be presented to the Committee with its approval

Authority to Increase the Budget for the
Camp Randall Shell Addition Project,
UW-Madison

PHYSICAL PLANNING AND FUNDING COMMITTEE

Resolution:

That, upon the recommendation of the UW-Madison Chancellor and the President of the University of Wisconsin System, authority be granted to increase the budget by \$432,000 for the combined Camp Randall Memorial Sports Center (Shell) Addition and the Hall of Fame Wall and Terrace Expansion, using \$150,000 Gift Funds and \$282,000 Program Revenue-Cash (Athletics), for a revised estimated total project cost of \$1,110,000 [\$781,000 Program Revenue-Cash (Athletics) and \$329,000 Gift Funds].

THE UNIVERSITY OF WISCONSIN SYSTEM

Request for Board of Regents Action November 2001

1. Institution: The University of Wisconsin-Madison
2. Requests: Requests authority to increase the budget by \$432,000 for the combined Camp Randall Memorial Sports Center (Shell) Addition and the Hall of Fame Wall and Terrace Expansion, using \$150,000 Gift Funds and \$282,000 Program Revenue-Cash (Athletics), for a revised estimated total project cost of \$1,110,000 [\$781,000 Program Revenue-Cash (Athletics) and \$329,000 Gift Funds].
3. Description and Project Scope: This project will provide two small additions at the south end of the Camp Randall Memorial Sports Center, located at 1430 Monroe Street. The additions will be constructed at the east and west ends of the existing maintenance/storage room, and each will consist of approximately 1,650 GSF.

The new space will be used by the Women's Intercollegiate Hockey Team. The west addition will serve as a locker room facility for the 24-member women's hockey team, including lockers, restroom and showers. The east addition will be shelled in to provide a future coaches' locker room, an equipment maintenance and skate sharpening room, a small classroom for viewing videos, and storage.

The additions will be built between the Shell's southern face and the space reserved for the gift-funded "Hall of Fame" extension project, which was approved in February 1999, and administratively combined with this project. The "Hall of Fame" portion of this project will add a wing on either side of the existing Hall of Fame in front of the Camp Randall Sports Center and the proposed additions. The project will include extending the 18-inch high stone wall and the existing brick walkway, as well as plantings in front of each wing.

4. Project Justification: In November 2000, and January 2001, the Board of Regents and State Building Commission respectively authorized construction of the Camp Randall Memorial Sports Center (Shell) Addition, at an estimated total project cost of \$499,000, using Program Revenue - Cash (Athletics). Subsequently, the Division of Facilities Development administratively combined this project with a the Hall of Fame Wall and Terrace Expansion project that was authorized in February 1999, at \$179,000 using Gift Funds. Combination was sought to enable both projects to be designed by a single architectural/engineering firm.

During design development, the donor of the Hall of Fame project requested upgrades in the design and materials of the facade. Additional landscaping will be incorporated than

initially envisioned. These embellishments will better complement the forthcoming Camp Randall expansion and renovation work. Also, the locker rooms were apparently underestimated. These factors attribute to the high bids received and the corresponding need to increase the budget and funding. Bids for the project were received on September 25, 2001. Eleven bids were received for the total construction work and ranged from a low of \$930,697 to a high of \$1,049,000.

This project will enable the Division of Intercollegiate Athletics to achieve compliance with Title IX and the Office of Civil Rights by providing needed new support facilities for the Intercollegiate Women's Hockey Team. The Division had a commitment to provide the women's locker room at the Shell by October 1, 2001, and based on the project schedule, an extension was granted until February 2002. Authority to increase the budget is needed to enable project completion as soon as possible to meet this commitment. The University has confirmed the availability of the additional Gift and Program Revenue funding.

5. Budget:

| | <u>As Authorized</u> | | <u>As Combined</u> | <u>This Request</u> |
|-----------------|----------------------|--------------|--------------------|---------------------|
| | Shell Addition | Hall of Fame | | |
| Construction | \$414,000 | \$156,000 | \$570,000 | \$930,697 |
| AE Design | 33,000 | 0 | 33,000 | 65,000 |
| DFD Management | 18,000 | 7,000 | 25,000 | 40,000 |
| Contingency | 33,000 | 16,000 | 49,000 | 74,303 |
| Percent for Art | <u>1,000</u> | <u>0</u> | <u>1,000</u> | <u>*</u> |
| Total | \$499,000 | \$179,000 | \$678,000 | \$1,110,000 |

*It was determined that Percent for Arts is not applicable.

6. Previous Action:

November 10, 2000
Resolution #8243

Granted authority to construct a Camp Randall Memorial Sports Center (Shell) Addition, at an estimated total project cost of \$499,000, using Program Revenue – Cash (Athletics).

February 5, 1999
Resolution #7854

Granted authority to construct a Camp Randall sports Center "Hall of Fame" Wall and Terrace Expansion project at an estimated total project cost of \$179,000, Gift Funds.

Approval of the Design Report and
Authority to Construct a Sandburg
Residence Hall Fire Protection System
Addition Project, UW-Milwaukee

PHYSICAL PLANNING AND FUNDING COMMITTEE

Resolution:

That, upon the recommendation of the UW-Milwaukee Chancellor and the President of the University of Wisconsin System, the Design Report be approved and authority be granted to construct the Sandburg Residence Hall Fire Protection System Addition project at an estimated total project cost of \$3,136,000 (\$80,000 Program Revenue – Cash and \$3,056,000 Program Revenue Supported Borrowing).

THE UNIVERSITY OF WISCONSIN SYSTEM

Request for Board of Regents Action November 2001

1. Institution: The University of Wisconsin-Milwaukee
2. Request: Requests approval of the Design Report and authority to construct the Sandburg Residence Hall Fire Protection System Addition project at an estimated total project cost of \$3,136,000 (\$80,000 Program Revenue – Cash and \$3,056,000 Program Revenue Supported Borrowing).
3. Description and Scope of Project: This project will provide fire protection for the 1,500 resident rooms and related areas in the existing north, south, and west residence towers with the installation of sprinkler systems and the upgrade of the existing fire pump and emergency generator to support the new systems. A pre-fabricated sheet metal soffit system will be installed to conceal and provide security for the horizontal sprinkler lines that route through public areas. The sprinkler system will be installed to meet the requirements of the National Fire Protection Association's Standard for the Installation of Sprinkler Systems (NFPA-13).
4. Justification of the Project: The Sandburg Residence Hall complex consists of four residential towers around a central low-rise Commons facility with underground parking. The original 26-story north, 20-story south, and 16-story west towers and commons were built in the late 1960's and early 1970's. The conceptual plan for the complex envisioned a fourth tower that was not needed at that time. The recently completed Sandburg Hall Addition and Remodeling project constructed a fourth east tower on that site to address increased demand for housing, and remodeled the central Commons facilities. A fire protection system for the new east tower was provided in that project.

The Wisconsin Legislature has passed legislation that requires that all high-rise residence halls have fire suppression systems installed by 2006. The three original towers do not have sprinkler systems. These systems will bring the complex into compliance with the law and will provide needed fire protection for the 2,150 residents who live in the three towers. Since the low-rise Commons has fire separation shutters at the entrances to each of the towers, it does not require sprinkling.

Because of the disruption involved with installing piping in every space, it will be necessary to spread out the project over at least two years. The project will be done during the summer months when school is not in session to enable the residence halls to meet commitments to summer programs.

Current room rates for residents in Sandburg Hall average \$2,526 per year. A 20-year bond repayment schedule for this project will require residents to pay an additional \$100 per year in dormitory fees starting in fall 2003.

5. Budget: Per the Design Report:

| | |
|-------------------------------|----------------|
| Construction Total: | \$2,502,400 |
| A/E Design Fee: | 199,400 |
| DFD Management Fee | 109,100 |
| Construction Contingency | 225,100 |
| Asbestos Abatement | <u>100,000</u> |
| Estimated Total Project Cost: | \$3,136,000 |

6. Previous Action: None.

Authority to Construct a Parking Lot
Project, UW-Stout

PHYSICAL PLANNING AND FUNDING COMMITTEE

Resolution:

That, upon the recommendation of the UW-Stout Chancellor and the President of the University of Wisconsin System, authority be granted to construct a 100-stall parking lot on university owned land on the UW-Stout Campus for an estimated cost of \$208,810 of Program Revenue Supported Borrowing-Parking.

THE UNIVERSITY OF WISCONSIN SYSTEM

Request for Board of Regents Action November 2001

1. Institution: The University of Wisconsin-Stout
2. Request: Requests authority to construct a 100-stall parking lot on university owned land on the UW-Stout Campus for an estimated cost of \$208,810 of Program Revenue Supported Borrowing-Parking.
3. Description and Scope of Project: This project will develop three contiguous gravel and broken asphalt surfaced parking areas into a single 100-stall paved parking lot known as Parking Lot 1. The project includes removing present broken asphalt and gravel surfaces, providing proper grading and drainage, concrete curb and gutter; surfacing, striping, enhanced landscaping, improved accessible parking, sidewalks and lighting. The lot will serve students who commute to the university.
4. Justification of the Request: Demand for commuter parking at UW-Stout is significant, especially in this area because of its central location and the proximity to Harvey Hall, Fryklund Hall, Communication Technologies, the Library Learning Center and Vocational Rehabilitation. Students, the city and the community at large support this project. While this project will not result in increasing the present 100 parking stalls in this unimproved area, it will create a single paved, properly lighted parking lot. The campus has 2,800 parking stalls and seeks to provide approximately 3,100 stalls. The 100 stalls in this project are included in the presently available stall count.

The area to be developed was acquired through three separate land purchases and combined to provide the current undeveloped parking area. Each time a parcel was acquired, improvements were demolished and a gravel surface provided for parking. The gravel is dirty and difficult to maintain. The area is poorly lit affecting the safety of users. One of the three parcels was a former city parking lot that the city sold to the university with the understanding that the entire area would be developed into a larger parking lot for the campus. In its current condition the area is a considerable eyesore, has poor traffic patterns, is difficult to maintain and has very poor lighting and minimal sidewalks.

Debt service for the additional required bonding will be paid from parking revenues. It is anticipated that the impact of this project will increase the cost of annual campus parking permits by \$3 a year for students, faculty and staff beginning in 2002.

| | | |
|----|----------------------|--------------|
| 5. | <u>Budget:</u> | |
| | Construction | \$175,000 |
| | A/E Design Fee | 14,000 |
| | DFD Supervision | 12,250 |
| | Contingency | <u>7,560</u> |
| | Estimated Total Cost | \$208,810 |

6. Previous Action: None.

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Authority to Enter into a Land Use
Agreement, UW-Superior

PHYSICAL PLANNING AND FUNDING COMMITTEE

Resolution:

That, upon the recommendation of the UW-Superior Chancellor and the President of the University of Wisconsin System, authority be granted for the officers of the Board of Regents to enter into a land use agreement to permit the University to use forty (40) acres of land owned by the Red Cliff Band of Lake Superior Chippewa as the site for the construction of the Aquaculture Demonstration Facility. There is no cost to the university for use of the land.

THE UNIVERSITY OF WISCONSIN SYSTEM

Request for Board of Regents Action November 2001

1. Institution: The University of Wisconsin–Superior
2. Request: Requests authority for the officers of the Board of Regents to enter into a land use agreement to permit the University to use forty (40) acres of land owned by the Red Cliff Band of Lake Superior Chippewa as the site for the construction of the Aquaculture Demonstration Facility. There is no cost to the university for use of the land.
3. Description and Scope of the Project: The agreement will provide a site for the University to construct the Aquaculture Demonstration Facility included in the 1999-2001 biennial budget with an allocation of \$3 M. The site is located at the northern most tip of Bayfield County, just north of Red Cliff on the Red Cliff Indian Reservation. The Red Cliff Band of the Lake Superior Chippewa has generously offered the land to the University at no cost. The agreement gives the Regents an initial twenty-year use of the land with automatic renewals until the facility is no longer needed or funding is discontinued. The current facility design includes a small Administration Building, two Aquaculture Barns for research and fish rearing, outdoor research and rearing ponds and various support facilities. The facilities will be constructed over a period of years with the first phase groundbreaking in May 2002, and a grand opening in May 2003. An Environmental Assessment will be conducted prior to entering into the agreement to ensure there are no existing environmental risks and to establish an environmental baseline for the property.

The 40-acre site is adjacent to the Red Cliff fish hatchery with a water supply adequate for Demonstration Facility needs and an area for environmentally proper discharge of water. The agreement will facilitate sharing of Red Cliff and University facilities for mutual benefit.

4. Justification of the Project: In 1996 The Ashland Area Development Corporation, with the assistance of Bright Consulting, Inc., developed a proposal for an aquaculture demonstration facility supported through a state Rural Economic Development grant. The 1999-2001 Wisconsin biennial budget contains a \$3,000,000 budget item for the construction of an Ashland Area Aquaculture with a mission to promote and advance the development of commercial aquaculture in a northern climate. The Demonstration Facility is to be operated by the University of Wisconsin System Board of Regents in consultation with representatives of the aquaculture industry. The University of Wisconsin System President designated UW-Superior to administer the development of this project in consultation with the other UW institutions, representatives of the aquaculture industry and representatives of other state and federal entities.

The Steering Committee met the first time in February 2000, to begin planning the facility and to move the plans through construction. The Committee explored site options for the facility and began design of the facilities. The Red Cliff site was chosen because it offers an adequate supply of water and an environmentally proper place to discharge used water.

5. Budget: There are no charges for the use of the land.
6. Previous Action: None.

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BOARD OF REGENTS OF THE UNIVERSITY OF WISCONSIN SYSTEM

BUSINESS AND FINANCE COMMITTEE

NOTICE OF PUBLIC FORUM ON TRUST FUND INVESTMENTS

Room 4151, Grainger Hall
975 University Avenue
Madison, Wisconsin

Thursday, November 8, 2001
3:30 – 5:30 p.m.

(Forum will begin upon conclusion of Business & Finance Committee meeting)

Forum Agenda

3:30 p.m. - Trust Funds Introduction

3:35 p.m. - Investor Responsibility Research Center Speaker
Overview of socially responsible investing
Review of 2001 proxy season
Emerging issues and outlook for 2002

4:30 – 5:30 p.m. - Public Testimony

All interested persons are welcome to attend and participate in this annual public forum on trust fund investments.

Those who wish to speak at the forum are asked to register in advance by contacting Judith Temby at 608-262-2324. Registration forms also will be available at the forum. All those attending the forum are asked to register at the door if they have not registered in advance.

Speakers are asked to limit oral remarks to two minutes so that as many people as possible can be heard. Written testimony is invited and encouraged, including written testimony from those who register to speak. This will ensure all interested persons an opportunity to express their views, even if it is not possible to fit all those who wish to speak into the time available at the forum.

BOARD OF REGENTS OF THE UNIVERSITY OF WISCONSIN SYSTEM

Friday, November 9, 2001

9:00 a.m.

1820 Van Hise Hall

1220 Linden Drive

Madison, Wisconsin

II.

1. Calling of the roll
2. Approval of the minutes of the October 4th and 5th meetings
3. Report of the President of the Board
 - a. Report of the October 19th meeting of the Higher Educational Aids Board
 - b. Report of the November 7th meeting of the Hospital Authority Board
 - c. Report on governmental matters
 - d. Additional items that the President of the Board may report or present to the Board
4. Report of the President of the System
 - a. UW Colleges and Wisconsin Technical College System Missions
 - b. 2003-05 Biennial Budget Process
5. Report of the Physical Planning and Funding Committee
6. Report of the Business and Finance Committee
7. Report of the Education Committee
8. Additional resolutions
9. Communications, petitions or memorials
10. Unfinished or additional business
11. Recess into closed session to consider honorary degree nominations at UW-Madison, as permitted by s.19.85(1)(f), *Wis. Stats.*, to consider salary adjustments as permitted by s.19.85(1)(c), *Wis. Stats.*, and to confer with legal counsel, as permitted by s.19.85(1)(g), *Wis. Stats.*

The closed session may be moved up for consideration during any recess called during the regular meeting agenda. The regular meeting will be reconvened in open session following completion of the closed session.

**Board of Regents of
The University of Wisconsin System**

Meeting Schedule 2001-02

2001

January 4 and 5
(Cancelled, circumstances permitting)

February 8 and 9

March 8 and 9

April 5 and 6

May 10 and 11 (UW-River Falls)

June 7 and 8 (UW-Milwaukee)
(Annual meeting)

July 12 and 13

August 23 and 24
(Cancelled, circumstances permitting)

September 6 and 7

October 4 and 5 (UW-EauClaire)

November 8 and 9

December 6 and 7

2002

January 10 and 11
(Cancelled, circumstances permitting)

February 7 and 8

March 7 and 8

April 4 and 5

May 9 and 10 (UW-Fox Valley and
UW-Fond du Lac)

June 6 and 7 (UW-Milwaukee)
(Annual meeting)

July 11 and 12
(Cancelled, circumstances permitting)

August 22 and 23

September 12 and 13

October 10 and 11 (UW-Whitewater)

November 7 and 8

December 5 and 6

BOARD OF REGENTS OF THE UNIVERSITY OF WISCONSIN SYSTEM

President - Jay L. Smith
Vice President - Gerard A. Randall, Jr.

STANDING COMMITTEES

Executive Committee

Jay L. Smith (Chair)
Gerard A. Randall, Jr. (Vice Chair)
Patrick G. Boyle
Guy A. Gottschalk
Gregory L. Gracz
Frederic E. Mohs

Business and Finance Committee

Guy A. Gottschalk (Chair)
Roger E. Axtell (Vice Chair)
Tommie L. Jones, Jr.
James R. Klauser
Phyllis M. Krutsch

Education Committee

Patrick G. Boyle (Chair)
Frederic E. Mohs (Vice Chair)
JoAnne Brandes
Elizabeth Burmaster
Toby E. Marcovich
Jose A. Olivieri

Physical Planning and Funding Committee

Gregory L. Gracz (Chair)
Lolita Schneiders (Vice Chair)
Jonathan B. Barry
Alfred S. DeSimone

Personnel Matters Review Committee

Toby E. Marcovich (Chair)
Roger E. Axtell
James R. Klauser
Jose A. Olivieri

Committee on Student Discipline and

Other Student Appeals

Frederic E. Mohs (Chair)
Jonathan B. Barry
Elizabeth Burmaster
Tommie L. Jones, Jr.

OTHER COMMITTEES

Liaison to Association of Governing Boards

Phyllis M. Krutsch

Hospital Authority Board - Regent Members

Patrick G. Boyle
Guy A. Gottschalk
Frederic E. Mohs

Wisconsin Technical College System Board

Lolita Schneiders, Regent Member

Wisconsin Educational Communications Board

Patrick G. Boyle, Regent Member

Higher Educational Aids Board

Gerard A. Randall, Jr., Regent Member

Research Park Board

Roger E. Axtell, Regent Member

Technology for Educational Achievement in Wisconsin Board (TEACH)

Jonathan B. Barry, Regent Member

Committee on Board Effectiveness

Phyllis M. Krutsch (Chair)
Jonathan B. Barry
Patrick G. Boyle
Jose A. Olivieri

Academic Staff Awards Committee

Lolita Schneiders (Chair)
JoAnne Brandes
Phyllis M. Krutsch
Toby E. Marcovich

Teaching Excellence Awards Committee

Roger E. Axtell (Chair)
Elizabeth Burmaster
James R. Klauser
Jose A. Olivieri

Oversight Board

Patrick G. Boyle, Regent Liaison

The Regents President and Vice President serve as ex-officio voting members of all Committees.