the university of michigan **Today**

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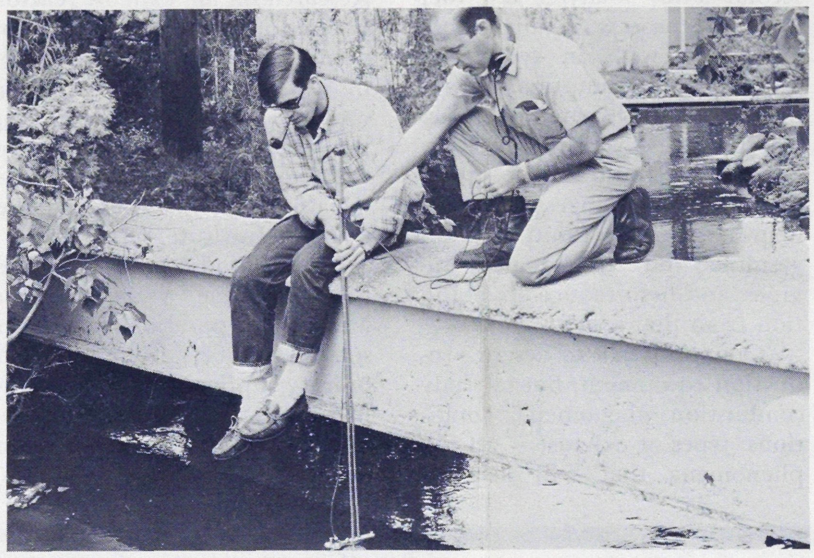
Rockefeller Grant Says:

'U-M a Leader in Environmental Studies'



Benzie Record

A U-M Public Health School survey team of Wallace McLean and Thomas Justus is shown during water pollution tests of Crystal Lake near Beulah, Michigan last summer. The U-M faculty/student crew made the tests at the invitation of the 'Keep Crystal Clear' Committee. **(See story on p. 3**

The University of Michigan recently received a $750,000 grant to expand teaching and research programs relating to the environment.

It was given by the Rockefeller Foundation which noted that, "Michigan has pioneered in research and study programs in environmental sciences. The University is now considered a leader in this field."

A large element of the 3-year Rockefeller-Michigan program will be to support graduate students who plan careers to maintain or improve environmental quality. By Fall an estimated ten students are expected to be supported in doctoral level programs by the grant; more will be enrolled in 1971 and 1972. Further, some post-doctoral one-year fellowships will be supported for students who wish to participate in interdisciplinary environmental studies programs.

Rockefeller funds will also make possible the addition of new faculty in environmental science specialties.

U-M Vice President for Research, A. Geoffrey Norman noted, "we have had substantial strength in this field for many years, but it has been in bits and pieces in several schools and colleges. Now we can begin to tie these things together in a coherent manner, to give interdisciplinary training to people who will be called on to solve environmental problems, to foster innovative research on these problems, and to create a focal point for faculty interest in the environment."

(Editor's Note. More on U-M's environmental research activities on this page and pages 2 and 3.)

'M' Environment Research Dates to 1880's

In 1881, the University of Michigan undertook teaching and research programs that deal with problems of the environment — with the interaction of natural, social and human forces on that environment.

Today, when concerned national attention is focussed on the issue of environmental quality, dozens of University units, both teaching and research, are conducting approximately 250 programs of varying sizes and orientation that deal with environmental problems and potential solutions. The history of this activity dates to the immedate post-Civil War years when forestry courses taught here dealt not with forestry alone, but with the influence of forests on human affairs, climate and sanitation.

Early in the 20th century the University became a center for the conservation movement. In the 1920's Dean Samuel T. Dana (for whom Laurance Rockefeller gave the University $250,000 during the $55 Million Program to help endow the Dana Professorship in Outdoor Recreation) laid the ground work for today's School of Natural Resources and for bringing the application of many scientific disciplines to bear upon the total understanding of the forest and its effect on climate, erosion, water supply, recreation, health and community development.

Michigan has also had a long-standing interest in water and water problems. Current programs include basic studies in hydrology and limnology and man's use of water for wild life, agriculture, and industry. U-M scientists and students are at work on the alleviation of water pollution, on public health and related aspects of water quality. For example, as shown in the photograph above, a team of scientists from the School of Public Health recently made a pollution survey of a recreation and fishing lake in Northern Michigan to determine how to control a developing pollution problem.

For many years the University has conducted research on the Great Lakes. Just recently that research was given added support through the National Science Foundation Sea Grant Institutional Support Program.

Because many of the problems of environment cross traditional department and discipline lines, a number of inter-discipline programs have been created—for example, in urban and regional planning, ecology, natural resource economics, water resource management, and a number of others.

The doctoral program in Urban and Regional Planning illustrates this cross-matching. The program candidate takes courses in the sociology of the urban community—a law course in public control of land use—a seminar on environment and behavior—political science courses that cover public administration and policy — civil engineering courses in transportation planning—and related courses in geography, psychology, environmental health, business administra-

(Continued on page 4)

Former Faculty Man Makes Gift to 'Bus Ad'

The U-M Business School has received a gift of $325,000 that sets the stage for a fund-raising campaign to build the first unit of a new management education center.

Clayton G. Hale, chairman of a Cleveland insurance underwriting firm, a former Business School professor and a member of the School's Visiting Committee, is the donor. Both he and Mrs. Hale, the former Laura Bartlett, are Michigan alumni and members of the U-M Presidents Club. Among their respective families are seventeen U-M alumni who have attended the University over a span of 110 years.

He is the author of some 70 technical articles on insurance and for a number of years was a professor of insurance on the U-M Business School faculty.

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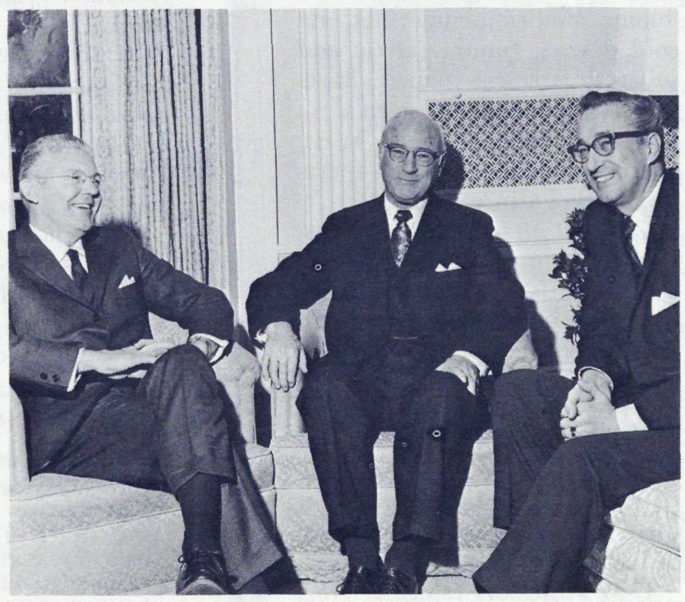


Clayton G. Hale, (center) of Cleveland visits with President Fleming (left) and Business Dean Floyd A. Bond. A former Business School faculty member Mr. Hale gave the school $325,000.

Regents Speak Out on Campus Conduct

The February Regents' meeting came just after two incidents of disorder involving students and non-students on campus and in downtown Ann Arbor. Several injuries, some damage and about 20 arrests resulted from the incidents. During their scheduled review of two new By-laws relating to students' role in decision-making, the Regents issued a formal statement which read in part:

"It is apparent that the great majority of the University Community finds violence, force and destruction of property unacceptable conduct on the part of those who wish to remain members in good standing of that community. It is equally apparent

(Continued on page 4)

A Close Look at Lake Michigan

The research technician shown at the right is counting tiny organisms found in Lake Michigan water samples. That work is part of an algae-pollution study directed by Dr. Eugene F. Stoermer, a research algologist in the U-M's Great Lakes Research Division of the Institute of Science and Technology.

His project is one of approximately a dozen current lake studies the 14-man Research Division staff has under way on Great Lakes waters.

Dr. Stoermer's work had two objectives — to inventory and identify sub-microscopic plant and animal life distributed around the lake; and to determine what the presence of these types of aquatic life says about the water condition. "Algae and other life are a pollution index," Dr. Stoermer noted. "Their growth is controlled by nutrients like phosphorus, and other chemicals, which could come from an industrial process, municipal waste plants or run-off water."

An inventory of aquatic life then, is a vital first step in knowing the condition of the Lakes. Besides its basic research value it has direct practical application, for example, for utility companies that want to build atomic power plants along the Lakes. According to Stoermer, the AEC requires a thorough scientific description of the waters as a condition of application for a permit. "A member of the Division staff is currently directing such a contract research project for several utilities," Stoermer noted.

The Great Lakes Research Division has been doing lakes studies since 1945. It is presently under the direction of David C. Chandler.

To Clean Up Exhaust

Diesel and gasoline engine exhaust emissions are under intensive study as a source of air pollution. At the University of Michigan several of these studies are under the direction of Jay A. Bolt, professor of mechanical engineering.

One project is aimed at understanding how to get more accurate metering of the fuel and air in the carburetor, because this is an important factor determining the composition of exhaust products, according to Bolt. A second study analyzes the fuel injection process in diesel engines, also with an eye to reduced fuel consumption and reduction of diesel engine smoke.

According to Professor Bolt, such studies could lead to equipment design changes that will help purge exhaust outputs from gasoline and diesel-fueled engines, and help reduce air pollution from that source.

"Our job is not to design production equipment, but to study combustion phenomena, conditions, types of exhaust — all the phenomena that will lead to complete understanding," Bolt says.

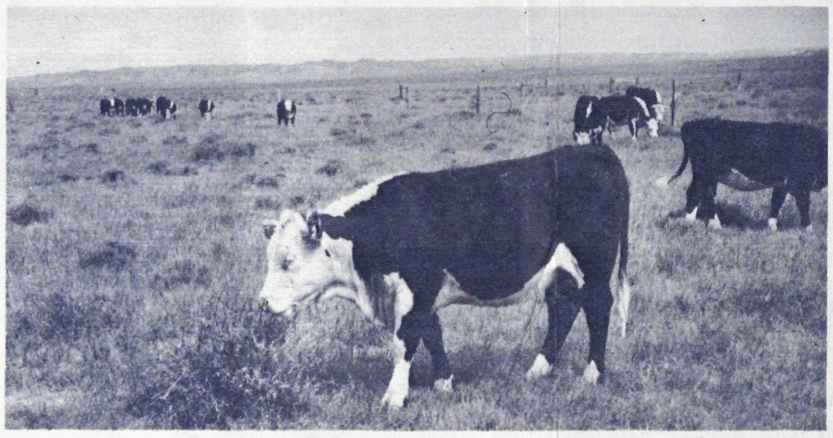
Analysis is aided by developing a computer simulation of each process.

Projects under Professor Bolt's guidance are inter-disciplinary, involving chemists, chemical, civil and hydraulics engineers, and are estimated at $300,000 annually, chiefly for support of faculty and graduate students. Two of the emission studies cited have been sponsored by the U.S. Public Health Service. Research on an 'exhaust reactor' system of emission control by chemical reactions which occur in an exhaust pipe system, is sponsored by the Co-ordinatng Research Council funded by the Automobile Manufacturers Association and the American Petroleum Institute.

Prof. Bolt also noted that over the past five years, General Motors Corporation has given some $120,000 for general laboratory support and educational programs and basic research related to emissions from automobiles.

U-M Scientists Work on the Environment

Displayed on these pages is just a random sample from more than 250 environmental research projects under way on this campus.



U-M is HQ for 'Biome' Studies

This photograph shows cattle grazing on Colorado grassland and symbolizes a $1.8 million federal research program designed to help us maintain and manage our natural resources.

The U.S. grasslands study is part of a larger American project within the International Biological Program, a 57-nation research effort in two broad areas — problems of the environment and problems of human adaptability.

Headquarters for this portion of the U.S. contribution to the IBP, called the 'Analysis of Ecosystems', is the University of Michigan where John A. Kadlec, U-M associate professor of Wildlife Management is co-ordinator for the Ecosystems program. Former U-M Department of Wildlife and Fisheries chairman Dr. Frederick E. Smith, who recently moved to Harvard, is program director.

According to Professor Kadlec, the grasslands project is just one of six planned 'biome' studies — a 'biome' being an area distinguished by specific types of plant life and climate. The other 'biome' studies include: hot and cold deserts; tundra (arctic and subarctic treeless plains); hardwood forests of the Eastern U.S.; evergreen forests of the West; and tropical forests (in co-operation with Latin countries).

Completion of these studies, according to Kadlec, will give U.S. scientists — some 800 of whom are involved — a thorough scientific profile of these critical environments. "At that stage we can more wisely deal with such practical questions as: what can we safely do to increase the food, or water, or timber yields from these 'biomes', with a minimum of harmful results," Kadlec said.

U-M Professors James V. Neel and William S. Benninghoff also direct phases of the IBP.

To 'Know Why' about Population

The U-M Population Studies Center is one of three centers that comprise the University's Population Program. The others are the Center for Population Planning and the Center for Reproductive Biology, whose titles are reasonably descriptive of their roles. (This report will not elaborate on their activities, but confine itself because of limited space to the Population Studies Center — Ed.)

First established of the three, the Population Studies Center is mainly concerned with training social scientists capable of developing studies of the social and economic organization of populations.

Dr. Otis Dudley Duncan, an associate director of the Center, notes that the Center tries "to develop the 'know-why' rather than the 'know how' of the ways people are organized in economic and social groups, of population dynamics including size and mobility."

A few examples of continuing and completed projects of the Center offer some idea of the scope and emphasis of its work:

—Childbearing patterns of Americans. Surveys of American reproductive behavior during the 1950's-'60's have produced data for studies of social and economic differences—in numbers of children born and in timing of family growth or child-spacing.

Dr. Duncan indicates that these data have very practical application for projecting population growth, and are used in particular, to forecast school populations.

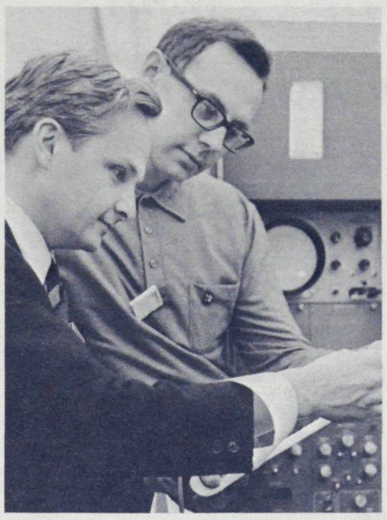
—Social stratification in America. Official and survey-collected statistics are used to analyze differences between blacks' and whites' access to jobs and housing, and how these differences affect family life.

—Fertility of blacks in the United States—a study developed for and supported by the Rockefeller Foundation.

Since its inception the Center has also done intensive population research in Asia, particularly along the West and Southwest Pacific perimeter — in Taiwan, Korea, Malaysia and Hong Kong.

Currently, according to Dr. Duncan, the Center has some 16 projects under way for either training or research purposes. The professional staff of the Center totals 15, chiefly from the sociology and economics departments of the Literary College. The Center's current budget is about $500,000, about half provided by the Ford Foundation, the balance in University funds and research grants.

Dr. Duncan says that 30-40 students are supported entirely or in part, by the Center's funds.



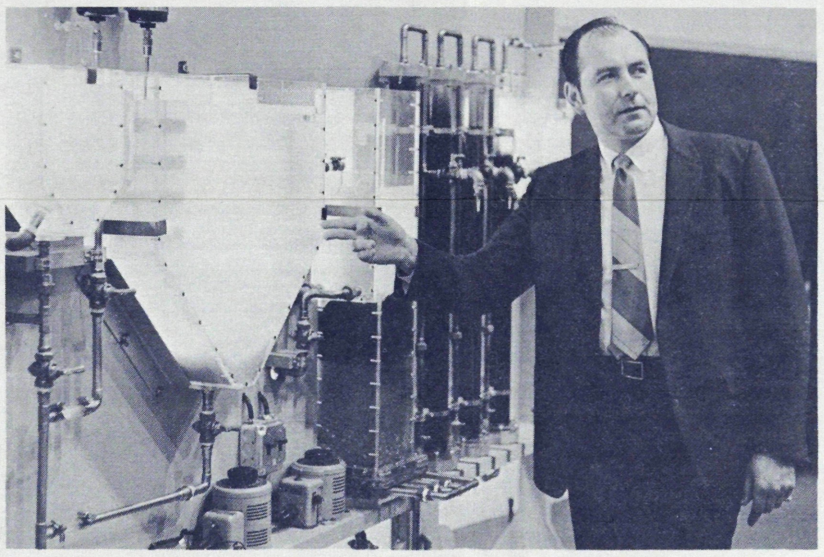
'What's in the Air?'

Shown reading the analyzer printout of an irradiated air pollution sample are Professor of Oceanography John W. Winchester (foreground), and Dr. Richard Dams, a visiting analytical nuclear chemist from Ghent, Belgium.

The particle samples were taken as part of a multi-state area survey of air pollution that centers on Chicago and Northern Indiana, and extends into Michigan and Ohio.

Prof. Winchester's project team has developed an innovative way to identify and measure some 32 chemical elements — among them such pollutants as vanadium, bromine and tungsten. About 20 have never before been detected and identified, he reports.

The method involves first making the samples of atmospheric particles radioactive in the Ford Nuclear Reactor (a gift of the company to the U-M Phoenix Research Project). Chemical analysis is then performed, Winchester explains, by identifying characteristic gamma radiation. Calculations of element concentrations and distributions with particle size are then figured by computer. Data on distributions, how far particles travel from a source, and the location and types of sources are a primary objective of the study along with training students in air pollution analysis and control. It is a joint project involving the U-M Department of Meteorology and Oceanography, and Great Lakes Research Division of the Institute of Science and Technology. It is supported by federal funds from the Atomic Energy Commission, U.S. Public Health Service, National Science Foundation, and the U-M's IST.



A New Way To Treat Sewage

A U-M professor has recently reported a new way to treat sewage that he indicates is cheaper than many methods now being used and meets two other pressing needs — for higher levels of water pollution control and for development of greater water supplies.

He is Walter J. Weber, Jr., a professor of Civil and Water Resources Engineering, shown above with a scale model which demonstrates his 'direct' physico-chemical method. The method has recently undergone successful 'on-line' tests in a 7,500 gallon per day pilot-scale plant near Trenton, N.J., he reported.

This process eliminates the bacterial or second stage of conventional sewage treatment methods, and functions by "coagulating waste matter with lime, aluminum, or iron salts followed by adsorption attachment of dissolved residue as it is filtered through activated carbon.

"The physico-chemical or direct process has several major advantages," Weber points out. "It's cheaper and more efficient. It can treat industrial wastes, household detergents, inorganic fertilizer elements, and resistant organic chemicals like pesticides and insecticides that conventional treatment can't deal with. Being more efficient it does more to reduce stream and river pollution by putting cleaner water back into the water source. Further, an installation requires 75% less land than a conventional system, and it can be housed in an attractive building; it does not require open tanks or beds," he says.

Finally, as a cheaper and more efficient way to reclaim existing fresh water he contends, it offers a more practical alternative, for inland cities especially, than desalting and transporting sea water to ensure adequate water supplies.

Prof. Weber's research has been supported by the Federal Water Pollution Control Administration. In addition to his work, the U-M Civil Engineering Department has had other waste treatment research underway over a number of years, notably that of Prof. Jack A. Borchardt.

Keeping 'Crystal' Clear

Lake and river quality in Michigan has been the subject of a number of research projects conducted by scientists of the Department of Environmental and Industrial Health in the U-M School of Public Health.

For example, Prof. John J. Gannon, recently headed a research team invited and, in part, supported by citizens around Crystal Lake near Beulah, Michigan to test the lake for pollution.

In Gannon's words, "it was an almost ideal combination — it meant an opportunity for the University to serve the community and provided a research and teaching/learning opportunity for students and faculty."

Goals of the study were to assess the existing quality of Crystal Lake water; find out the effects of nutrients in the water in producing algae and bacteria; and to identify and measure the major pollution sources.

A citizens group calling itself the "Keep Crystal Clear" Committee raised $13,500 to help pay half of the cost, largely for student and faculty maintenance in the field and supplies.

The survey team including Gannon, a public health engineer; Prof. Michael Bender, an aquatic biologist; Prof. Chester Wezernak, an engineer; Edward H. Armbruster, a bacteriologist; and graduate students Thomas Justus, Walter McLean, Thomas Hartman and Wallace Fusilier, made extensive tests of the lake during May-September 1969.

With complete co-operation of the nearby community, they set up a laboratory in the Benzie High School chemistry department to analyze test samples taken from the lake.

The study has been completed and the report is scheduled for presentation to the "Keep Crystal Clear" Committee this spring, Gannon says.

Involving the Community

A U-M research team, under contract with the U.S. Army Corps of Engineers, has been studying and developing ways to get better communication between the public and government agencies involved in planning the development of water resources in the Susquehanna River Basin, the largest on the East Coast. People in three states could be affected by Corps' plans.

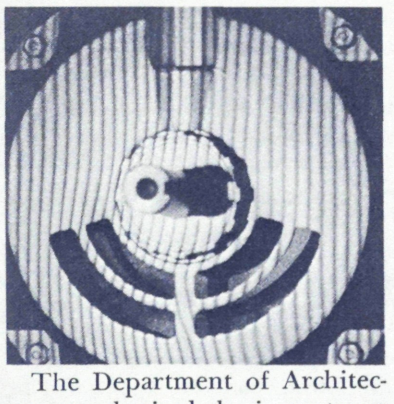
According to research associate Thomas E. Borton, two general strategies were used in the Susquehanna study: 1) to develop alternative objectives for preliminary plans being prepared for presentation to the public; 2) to include expressed public preferences and suggestions in the ultimate program to meet water-related needs for the next 10-15 years.

The research team helped develop such means as public forums and community leader workshops to increase the exchange of information between Federal, State and local decision-making groups. It also used a series of interviews and questionnaires to gauge attitudes and opinions of participants as the program progressed. The ultimate objective was to give interested citizens a meaningful opportunity to participate in the water resources planning process.

The project team included Borton and Katharine Warner, research associates in the Environmental Simulation Laboratory and Prof. Spencer Havlick, of the School of Natural Resources. J. William Wenrich of the Center for Research on the Utilization of Scientific Knowledge, ISR and John Frost, also members of the survey team have now gone to other universities.

Studying Ear Pollution

The pattern photograph shown here represents vibrational bending of the end bell of an electric motor of a type common in large household appliances and industrial machinery. It was photographed using laser light by Norman Barnett, associate professor of Architecture and research physicist, as part of his research in acoustical problems associated with home and factory equipment. It is one aspect of the general problem of environmental noise pollution, in Prof. Barnett's view.



The University has actually been involved in acoustical research since the 1920's, Prof. Barnett notes, largely on a contract basis to solve specific noise reduction problems. One of his recent projects for example, was supported by a major household appliance manufacturer — "it was a problem in psycho-acoustics," he says, "to determine public tolerance levels for appliances."

The Department of Architecture emphasized the importance of acoustics as an environmental problem when the architecture curriculum was completely revised three years ago. Two important study areas included at that time were: Man and Environment and Environmental Technology. Along with the heat and light environments of new buildings, Architecture students now study the acoustical environment as a major element to be considered in design and construction, Barnett says.

'the Vital Margin'

Your gifts to the annual giving program during 1969 helped make it another banner year of private support for the University of Michigan. Although final figures are not certified, it is apparent that the Fund realized a new record in gifts during its 16th year of operation, according to Michael Radock, vice president for University Relations and Development. He pointed out that nearly $3 million — $2,900,776, was given by alumni and friends of Michigan. This record is all the more outstanding because other universities have indicated declining support. And in fact, the record MAF gift total came from some 2,300 fewer contributors compared with 1968, according to Radock.

Gifts to the Alumni Fund (whose name was changed January 1, 1970 to the Michigan Annual Giving Fund to reduce the confusion between the Alumni Fund and the Alumni Association) provide support for many different programs within the University. A significant percentage of these reflect the specific interests of the donor who designates his gift for a particular fund or program. Many gifts are also earmarked for memorial funds, class funds, and for professional school funds. All gifts are received with sincere appreciation for the important part they play in helping Michigan advance its teaching, research and service objectives, Radock said.

'Teach-In' Focusses on Environment

The U-M campus was the scene March 11-14, of a Teach-In on the Environment organized by ENACT (Environmental Action for Survival), a community wide organization of students, faculty, civic and church groups, businessmen and housewives. The Teach-In was aimed at all aspects of environmental pollution and degradation.

Five major programs were scheduled during the four-day Teach-In, anticipating an April 22 date for similar meetings around the state and nation.

Among scheduled speakers were eminent biologists, entertainers, industrialists, government officials, labor and political leaders who are helping focus attention on the increasing national concern for the quality of our natural environment.

The schedule included panel discussions, lectures, entertainment, workshops, conferences, exhibits, films, fairs, clean-up, protest and action projects.

U-M President Robben Fleming was master of ceremonies and Michigan Governor William G. Milliken gave the welcome at the opening meeting in the University's Crisler Arena, formerly known as the University Events Building, that attracted some 13,000 people.

'M' Environment Research Dates to 1880's

(Continued from page 1)

tion and economics. The committee administering this program is of course, comprised of faculty of the related departments and units.

With approximately 250 programs under way, it is impossible to report all of them in limited space.

At the same time, an indication of the scope of the University's commitment to environmental quality studies and training can be seen from a partial list of U-M departments, centers and institutes, that deal with some aspect of environmental matters.

—Among departments are forestry; landscape architecture; resource planning and conservation; wildlife and fisheries, in the School of Natural Resources; in the Engineering College, chemical engineering; civil engineering; meteorology and oceanography; and mechanical engineering; in the LS&A school, botany, economics, geography, geology, and mineralogy, sociology and zoology; and in the School of Public Health, the Environmental and Industrial Health Department. Also involved are the Schools of Law, Medicine and Business Administration, and the Dearborn Campus which has become a center for the University's urban service and research programs.

Among other units are: the Architectural Research Laboratory; the Environmental Simulation Laboratory; the Highway Safety Research Institute; the Institute of Science and Technology; and the Population Studies Program.

Regents Speak Out on Campus Conduct

(Continued from page 1)

that the University has a right and a duty to protect its members and its facilities from such acts. Certainly the University can ill afford costs of vandalism in this period of financial constraint when we seek to increase the adequacy of our aid to disadvantaged students.

"The Regents note the faculty Senate Assembly position, as expressed in the Assembly's endorsement of the statement by the Senate Advisory Committee on University Affairs: 'The University must resist the efforts of all outside and inside forces that would restrict its freedom, let alone the civil liberties of some of its members.'

"The Regents sincerely believe that faculty and students should be integrally involved in writing the ground rules in which an academic community can do its work . . ."

Adopting the new By-laws the Regents authorized creation of a University Council,

"whose function is to formulate uniform regulations governing the conduct of students, teaching staff, and administrators."

The Regents then asked that,

"the University Council then address itself to formulating a regulation covering violent behavior toward persons, willful destruction of property, and deliberate obstruction of University functions. In the belief that the Regents are clearly responsible for the orderly operation of the University, the Council will be asked to present proposed regulations to the Regents as soon as possible. . . ."

Plans Outlined to Expand 'Opportunity Awards' Program

At their March meeting the U-M Board of Regents approved the following plan for expanding minority group enrollment and the University's Opportunity Awards Program. It reads:

1. The Board of Regents concurs in the suggestion that questions of admission and financial aids be separated for program analysis, in all the schools and colleges.

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2. That the Board of Regents then concurs in the establishment of an admissions goal which is designed to produce by 1973-74 admissions aimed at 10 per cent enrollment of black students and substantially increased numbers of other minority and disadvantaged groups.

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3. In reaffiming the conviction of the importance of recruiting added numbers, the Board of Regents recognizes that increased funds for staff (both recruiting and counseling) and for financial aid will be required. It therefore commits for 1970-71, a minimum of $100,000 for employment of staff, strategically placed to assure the broadest intensification of the effort.

Moreover, the financial commitment to the program (for both staff and financial aid) will be raised from its present level of approximately $1,000,000 to $3,000,000 by 1973-74. The allocation of the annual increments between staff and financial aids can be determined best on an annual basis. It may be noted that $3,000,000 represents an amount greater than the total present General Fund Budget for financial aid. It must also be noted that in providing this level of guaranteed financial support, the commitment provides a top priority of University funds, and the achievement will require active support from all operating units of the University.

It is recognized also that the financial support thus guaranteed will require supplementation, and the recruitment program should include efforts to seek out students with veterans' educational benefits so that numbers may be increased while alleviating the financial drain.

In addition, intensified efforts will be undertaken to raise additional funds from state, federal and gift sources, including the many local foundations now being contacted. We invite the assistance and suggestions from the many groups interested and benefitted by the program.

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4. The criteria for admissions of disadvantaged students should continuously be studied and experimented with in such a way that the objective of increasing enrollment may be achieved while at the same time preserving a satisfactory probability of successful completion of the educational program at the University.

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5. The total Opportunity Award Program, including recruitment, admissions, and financial aids will be centrally coordinated in the Office of Vice President Spurr, working with a committee consisting of students, faculty, and administrators.

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6. By separating admissions from financial aids, it is clear that admission of self-supporting students, and the strategic allocation of resources in individual cases based on need, will advance the achievement of the admissions goal.

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7. In addition to the assertion of a goal of admissions, and the commitment to increase total dollar support of that program, the University will provide General Fund support, in the College of Literature, Science and the Arts for 1970-71, in the amount of $170,000, to provide support for continued development of the Afro-American Studies Program, the initial development of the Black Students Center, and the funding of special seminar support. The allocation among the three purposes will be handled within the College to assure the best use of the funds for total development. Program Centers for other groups may in the future be appropriate in the University.

Gift to 'Bus Ad' Starts Fund Campaign

(Continued from page 1)

Mr. Hale said that his gift was "to act as a catalyst to launch a fund campaign to complete the first phase of a building program at the Business School, and specifically to finance a 450-500-seat auditorium for the center."

According to Dean Floyd Bond, "the auditorium will be the central unit of the new assembly hall in the center and carry Mr. Hale's name. With the $300,000 given to this School during the recent $55 Million Program," the dean noted, "Mr. Hale's gift gives us a significant boost toward our $1 million goal for the first stage of this major project." The new assembly hall will be located adjacent to the present Business School.

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