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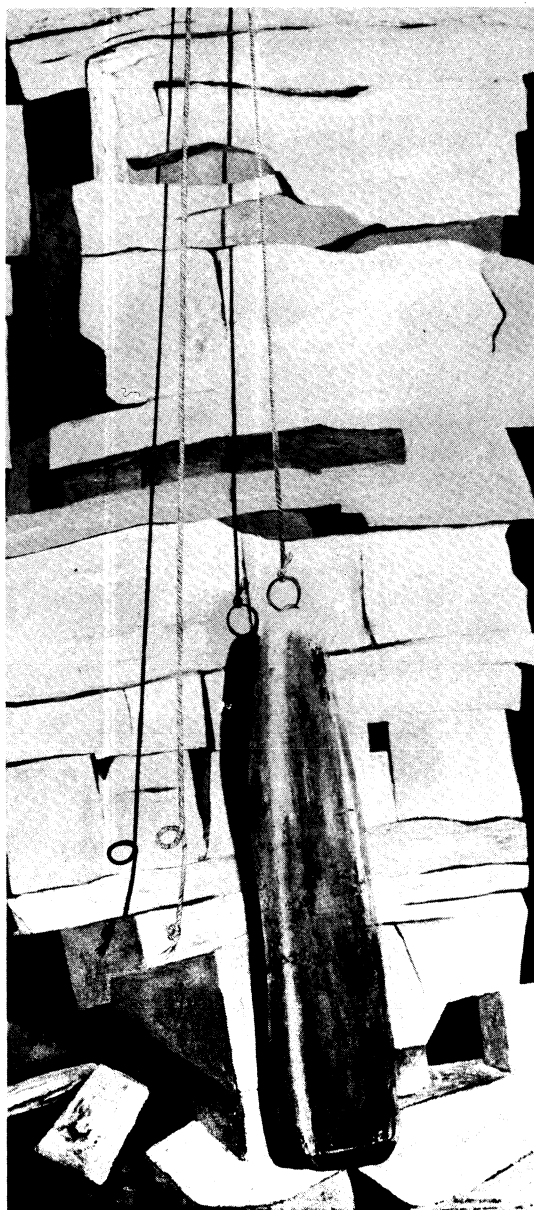
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WISCONSIN ACADEMY REVIEW

SPRING, 1957



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WISCONSIN ACADEMY REVIEW

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WISCONSIN ACADEMY REVIEW

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BE SURE TO MARK YOUR CALENDAR FOR ANNUAL ACADEMY MEETING

AT BELOIT COLLEGE April 26 and 27, 1957



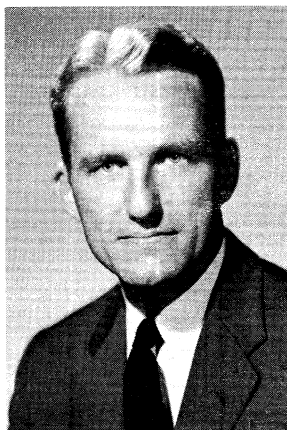
BELOIT COLLEGE—ITS HISTORY AND FUTURE

By R. Miller Upton, President

"I see this college grown to manhood ... honored of men, beloved of God--a fountain of intelligence, the home of piety, a promoter of the nation's liberties."

These prophetic words of Dr. Aaron Lucius Chapin, Beloit College's first President, have served as guide and inspiration during the more than a century of Beloit's growth in the service of education. The college of 1957 is dedicated, as was the college of 111 years ago, toward a continuing effort to play as vital and distinctive a role as possible in American higher education.

Beloit's proud and colorful past has contributed a rich heritage for those of the present college to emulate and to build on. Many specific reminders of that past are in evidence on the college's elm-shaded campus in downtown Beloit. Reminiscent of the days when pre-historic Indians camped and hunted in the Rock River valley are some 50 Indian burial mounds which dot the campus. And surrounding the college grounds are many sturdy white frame homes built by early settlers in the style of the New England residences from where they had pioneered west in the mid-1800's. The nearby First Congregational Church, with its impressive tower, is another reminder of Beloit's New England heritage.



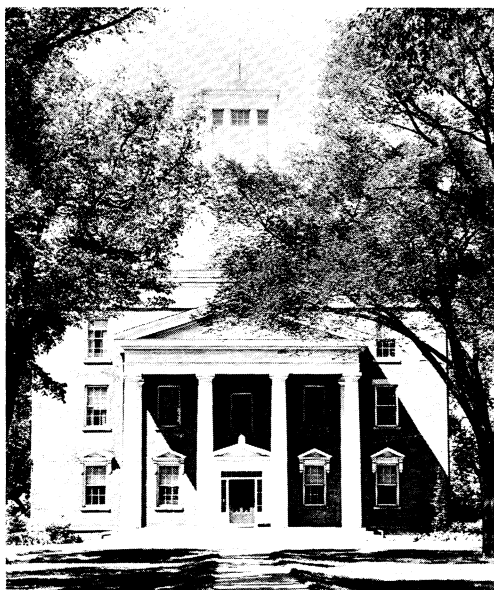
The Beloit campus is also of the present--and the future. Imposing modern buildings such as the Field House, Wright Art Hall, Strong Memorial Stadium and a new chapel and student union, stand as evidence of the growing college of today--a college continually adapting itself to the changing needs and problems and responsibilities of a changing society.

The idea of a college in "the West" was conceived on the Steamer Chesapeake on Lake Erie early in the summer of 1844, as a group of seven men gathered in a stateroom on their return from a convention of Christian men and women in Cleveland. The plans to open the college in the

Territory of Wisconsin took shape rapidly during succeeding months. In a series of conventions held in the village of Beloit (then less than 10 years old and with a population of 1,000), a site was selected, a Board of Trustees chosen and a charter adopted. The charter, which was enacted into law by the territorial legislature on February 2, 1846, is one of the earliest charters known providing for an educational institution which shall be completely nonsectarian. This independence of spirit and freedom of inquiry has continued to characterize the college during its growth.

Land for the college site, an attractive tract overlooking Rock River, was donated by the early settlers of the village. In 1847, a year after adoption of the charter, Middle College, the oldest college building northwest of Chicago, was begun. Long a campus landmark, this red brick structure now houses the college administrative offices. First classes were held during the fall of 1847, and the college has continued uninterruptedly since that time. Beloit's first graduates received their degrees in 1851. Since then the college has awarded more than 5,500 degrees. Living alumni now number about 8,000.

Beloit became known as the "Yale of the West" in its earliest years when the Yale influence in the first faculty



Middle College

resulted in a curriculum in the classical tradition largely modeled on that of the New England institution. The first president, Aaron Lucius Chapin, who took office in 1849, was himself a Yale man. Seven buildings were erected during President Chapin's incumbency (1849-1886) and the school became widely known for its scholastic excellence. Enrollment increased, but never exceeded 100 students. Then, under the long administration of President Edward Dwight Eaton (1886-1917) great changes took place. Enrollment surpassed 400, the curriculum was broadened, scientific "majors"

introduced and women admitted, the latter action coming in 1895. It also was a time of new building as dormitories, a gymnasium, science hall and a new library were erected. The library was one of the first given to an American college by Andrew Carnegie.

Following World War I, during the administration of President Melvin A. Brannon, enrollment continued to increase, and with the celebration of the school's 75th anniversary came renewed interest among citizens of Beloit in affairs of the college. This close relationship of town and gown has continued and expanded in succeeding years.

Another period of extensive building was accomplished in the period from 1927 to 1933, during the administration of President Irving Maurer. Men's dormitories, Wright Art Hall, Morse-Ingersoll Recitation Hall, Walter Strong Stadium and fraternity quadrangle units were erected and other campus buildings extensively remodeled. There also was a renewed emphasis upon the liberal arts and spiritual values to be derived from a Beloit education. "The end of good education is an integration of life," President Maurer stated.

The influx of veterans after World War II again boosted Beloit's enrollment to its highest point--more than 1,000--and it has continued at approximately that figure since the post-war period. President Carey Croneis's administration during the nine-year period following World War II saw continued substantial improvement in the physical plant and appearance of the college campus. Meanwhile, as Beloit started its second century, Dr. Croneis declared, "The beginning of its second hundred years finds the College grown to a lusty educational manhood surpassing anything that Chapin envisaged. ... Dr. Chapin's dream will never die because in the minds of all the many who love the College, it is forever being reborn."

The Beloit of today has a campus of more than three dozen buildings, with continued expansion of the physical plant still underway. Recently completed were a \$350,000 addition to the Field House (including a large natatorium and indoor track building), a new student union, and a 1,200 seat chapel to replace the edifice destroyed by fire in 1954. A new fraternity house and an addition to another house currently are nearing completion, with a new dormitory for women and all-college dining hall scheduled to be constructed in the immediate future. The future building timetable also includes such plant additions as a new library, a new theater and music building, a new men's dormitory and new married student housing.

Beloit's present student body comes from 28 states and 10 foreign countries, and her graduates are found in

all parts of the world. Beloit is dedicated to the proposition that the best type of education can be obtained by a relatively small group of selected students, living together in a closely knit college community, studying under well-trained, sympathetic, experienced teachers. It believes in the importance of the individual and has purposely restricted its numbers so that each student feels himself an important and significant unit.

The Beloit of the future? We hope it will retain the traditional emphasis on excellence which has brought distinction to its name in the past. We wish to remain a strictly undergraduate college emphasizing quality of instruction in the general area of the "liberal arts." For the foreseeable future we plan to restrict our enrollment to an absolute maximum of 1,200 full-time students. We aim to bring our salary scale to the point where we can compete effectively for staff with the top liberal arts colleges in the nation. We also will seek to develop a faculty intensely dedicated to the uniquely strategic educational mission of the small undergraduate liberal arts college and competent to achieve its potential as fully as possible. And we plan to carry out a full-scale continuing education program for our graduates and for the Beloit area community. A Beloit education must have as its prime objective the development of the individual intellect to the point that the student is enabled to become a responsible and secure person, free in thought, free in attitudes and free in day-to-day living.

I have pledged myself to see that Beloit College remains small in size, independent in structure, experimental in character, intimate in its environment, and above all else, as a summation of these separate qualities, distinctive in performance. For if, in the final analysis, Beloit or any college like it is not truly distinctive in its mission and its accomplishments, then what would be the price of its loss?

#

R. MILLER UPTON was elected President of Beloit College January 2, 1954. He is the sixth president in Beloit history since the school's founding in 1846. A graduate of Tulane University where he was president of the student body, he received his M.B.A. degree from Harvard University in 1940, and his Ph.D. from Northwestern University in 1948. Before coming to Beloit he was Dean of the School of Business and Public Administration at Washington University of St. Louis.

THE LA CROSSE SOIL CONSERVATION EXPERIMENT STATION*

By Orville E. Hays
Project Supervisor

In 1929, Congress appropriated funds for the establishment of ten soil and water conservation research stations to be located in areas where water erosion was a major problem. In 1931, the State of Wisconsin purchased a farm near La Crosse to be used as a soil and water research center for the upper Mississippi valley region. This Station is now operated by the Agricultural Research Service of the United States Department of Agriculture in cooperation with the Wisconsin College of Agriculture.

Studies are conducted on small watersheds and plots to develop better methods of managing cropland, pasture, and timberland so that sloping soils will be capable of absorbing more of the rain, thereby reducing runoff and erosion and increasing yields of crops. Measurements of runoff and erosion are made after each rain or thaw causing runoff. It has been found that most of the soil loss occurs during a few intense rains each year. During the past 25 years, four rains a year have caused 95 per cent of the erosion and 84 per cent of the runoff from corn. Erosion during the fall and winter months is quite low. Less than two per cent of the annual soil loss occurs during the period of October through February.

Soil loss by crop

Crops vary in the amount of protection given the soil against the beating action of the rain. In general, the more dense the vegetative cover, the lower the soil loss. A soil type will vary in the amount of erosion under the same cover and slope conditions depending upon the cloddiness of the surface, the amount of organic matter in and on the surface, and the preceding crop.

<u>Crop</u>	<u>Runoff, inches</u>	<u>Soil loss, T/A</u>
Corn	2.4	4.9
Oats	4.3	11.4
Hay-1	3.3	0.7
Hay-2	3.4	0.3
Hay-3	3.0	0.3

* - Maintained by the U. S. Department of Agriculture, Agricultural Research Service, Soil and Water Conservation Research Branch, in cooperation with the Wisconsin College of Agriculture.



Aerial photo of La Crosse Soil Conservation Experiment Station showing some of the projects discussed here.

Erosion control practices

Corn: Plow-plant and interseed

In this system, tillage is minimized so that the coarse, rough, absorptive soil structure is maintained over a longer period of the growing season. It also removes spring grain from the rotation, or at least grain does not follow corn. Soil losses from grain following corn have averaged more than twice as much as from corn following hay.

In the plow-plant method, the hay land is not plowed until a few days before corn planting. The corn is planted on the freshly plowed soil without tillage. The tractor wheels and the corn planter are adjusted so that the corn is planted in the tractor tracks. The tractor wheels prepare the seedbed for the corn. Soil and water losses are less than one-half as much from corn grown in this system as from corn grown in the normal seedbed.

When the corn is between 15 and 30 inches high, after having been cultivated twice, legumes are interseeded

between the corn rows. For best results in interseeding, the corn rows should be 60 inches apart. The interseeding may be done with a high clearance grain drill adjusted to straddle the corn row and equipped with packing wheels or with a cultipacker seeder narrow enough to fit between the corn rows.

Small grain - after hay

Soil loss from grain can be greatly reduced by following a rotation in which grain is grown after hay. The hay land can be fall plowed or a suitable seedbed can be prepared by the use of a large field cultivator without plowing. If the latter system is followed, it is necessary that cultivation be started so that the legumes and grass are killed in the fall. Measurements show that small grain after corn lost 2.4 times as much runoff and 5 times as much soil as small grain after hay.

Strip cropping

A strip cropping system must include a rotation which is at least 50 per cent hay in order that alternate strips will be in hay. Contour strip cropping will reduce soil loss to 50 per cent of the loss from the same rotation contour planted. Strips laid out with a 2 or 3 per cent grade toward a waterway are more effective than strips on the exact contour. In a graded strip, each furrow or row tends to divert the runoff towards the outlet so that less water is flowing directly down slope. Measurements show that a graded strip cropping system allows about two-thirds as much soil loss as strips on the exact contour.

Terraces

A correctly designed and maintained terrace system is the most effective control for sloping cropland. During runoff periods, water flows for only a short distance before it is intercepted by a terrace channel and led slowly from the field. Terraces constructed at the La Crosse Station in 1932 are still of ample capacity and giving good erosion control. They are maintained by the way in which they are plowed. Once in a rotation a dead furrow is left in the channel and a back furrow on the ridge.

Pasture

Pasture renovation increases production and decreases runoff and erosion. The soil compacted by years of grazing is loosened and the existing vegetation killed. This can be accomplished by the use of a large field cultivator or a combination of herbicides and minimum cultivation. The area must be limed and fertilized according to need

as shown by soil tests, and seeded to alfalfa, ladino, and brome. The result is a pasture that will carry from two to three times as many animal units and from which there will be less runoff and erosion.

Woodland

A timber area protected from fire, grazing, and outside runoff will, within a few years, produce a surface mulch with improved soil conditions capable of absorbing even the most intense rain experienced during the past 20 years without runoff. Grazing with livestock destroys the mulch and small trees, and will result in high amounts of runoff and erosion.

Visiting the Station

We are glad to arrange to show groups of visitors the research work being conducted at our Station. Each year there are approximately 3,000 visitors from Wisconsin, Minnesota, Iowa, and Illinois.

#

A NOTE ON THE COVER

The cover this month is reproduced from a painting by BURTON LEE POTTERVELD, Associate Professor of Art and Art Education, Univ. of Wis.-Milwaukee.

The subject, that of a fish net buoy hanging against the rocky bluff of the west shore of Door County, comes from Potterveld's tour of duty as staff member at the State College's summer session of 1955 held at "The Clearing."

Potterveld was born at Dubuque, Iowa, in 1908. He studied at Layton School of Art with Sinclair, Quirt, and von Neumann, and at the Univ. of Wis.-Milwaukee, University of Dubuque, and Univ. of Iowa. He taught at Layton School of Art and Carroll College before going to his present position. He has exhibited at the International Watercolor Show, American Painting Exhibition and several other shows. His main interests are painting, graphic art, and design. He has written articles for the Standard Editorial Society, Chicago, and prepared a catalog of the Pfister Hotel Collection of 19th Century Art.

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April 26 and 27, 1957

THE JOHN MUIR MEMORIAL PARK

By F. B. Trenk, Extension Forester
UW Dept. of Forestry and Wildlife Management

On May 5, 1957, some ninety-odd years after John Muir left "the Wisconsin University for the University of the Wilderness" Marquette County officials, with representatives of the University, the State Historical Society, and county and state associations interested in the achievements of Muir, will dedicate the John Muir Memorial Park. It is the only public memorial in the state identified with the waters, woods and meadows he intimately knew and loved in his early boyhood.



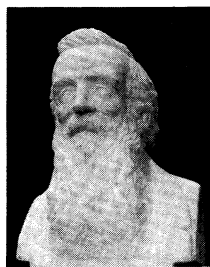
Muir at the age of 23

There is something of the earthy spirit of Yankee trading in the means by which Marquette County obtained the deed to about 35 acres of land and more than half of the shoreline of Muir's Fountain Lake. Audley Cuff's farm was rent by county trunk highway F, which separated his best pastureland from the farmstead. Marquette County agreed to swap county highway labor for 35 acres and the lake frontage owned by farmer Cuff, who in turn gets easier access to the pasture he will improve, and so make more resistant to soil erosion. But it would be a gross misstatement to imply that Mr. Cuff was motivated principally by hope of personal gain. He, too, has been interested in the promotion of a

Memorial Park. By his generous act, Wisconsin at long last has a Muir Park on the very site of Muir's earliest lessons in the animal and plant life of mid-America.

Local leadership for the planning of dedication services has been given by the Marquette County Board Public Property and Planning Committees, the Montello Woman's Club, Marquette County Homemakers, and the Farm Bureau Women of Marquette County. The Wisconsin Historical Society and the University appointed staff members to work with the several committees in Marquette County in planning the dedication and the future development of the park area.

A MARBLE BUST OF MUIR
done by
Edwin Keith Harkness
of Los Angeles and
purchased by the U.W.
Board of Regents in
1944. Office of the
President, Bascom Hall



Mrs. Jean deLipkau, Muir's grand-daughter (daughter of Wanda Muir Hanna), a resident of Martinez, California, adjacent to the Alhambra Valley vineyards which Muir developed to a high state of productivity, was

selected by the Marquette County group to unveil the memorial marker. Mrs. deLipkau has had a life-long interest in the Wisconsin background of her grandfather, and has been corresponding with Marquette County citizens whose memories date back to the residence of other members of the Muir family.

The memorial marker is a massive block of Montello granite, polished on one face, rough-chiselled on the others, the gift of the Messrs. Clarence Troost, Senior and Junior, of the Montello Granite Company. Inscribed on the granite is the following statement:

"John Muir, foster son of Wisconsin, born in Scotland April 21, 1838.

"He came to America as a lad of 11, spent his 'teen years in hard work clearing the farm across this lake, carving out a home in the wilderness.

"In the 'Sunny woods, overlooking a flowery glacial meadow and a lake rimmed with water lilies,' he found an environment that fanned the fire of his zeal and love for all nature, which, as a man, drove him to study, afoot, alone and unafraid, the forest, mountains and glaciers of the west, to become the most rugged, fervent naturalist America has produced, and the father of the national parks of our country."

The topography of the land which comprises the park is ideally adapted to the two major uses to which the park will be put. The marshy border of the outlet creek from Fountain Lake, draining to the west, separates very effectively the rolling northwest quarter, in which recreational facilities will be developed, and the woods and meadows of the south half, which are to be preserved as a natural area. Bordering this woods on the south are a few ancient prairie grown oaks which without doubt were growing there when Muir was a boy. This land could very likely be acquired as an addition to the park if the people of Marquette County wish it.

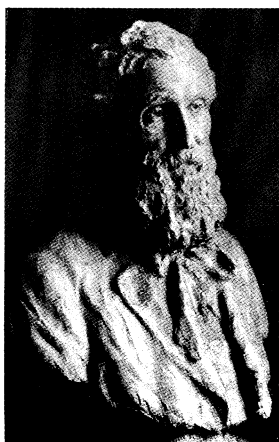
The park's recreational unit is not adapted to use by

large numbers of people at one time. The county will not encourage mass use of the park. A landscape development plan, prepared by graduate students of the Department of Landscape Architecture under the supervision of Professor G. W. Longenecker, provide for a limited number of picnic tables, cast-iron type broiler grills on steel posts, a well and hand pump, a small shelter house, a parking lot adequate for medium-sized groups, a softball diamond, and necessary sanitary facilities.

The bog, the woods and the meadow in the south half are the most intriguing parts of the park, historically and biologically; and they will offer the greatest challenges to those who want to make of the area a true shrine to the man whose name it bears. There is a bit of prairie to be restored, partly with the controlled use of fire. There are rare plants--reported to have been rare even in Muir's day--which will call for more than transitory protection.

- - - -

BRONZE BUST of JOHN MUIR



presented to the University of Wisconsin by Thomas E. Brittingham, was done by C. S. Pietro of New York and is a duplicate of that made for the American Museum of Natural History. At dedication ceremonies in Music Hall on December 6, 1916, President Charles R. Van Hise said in concluding his address:

"It was especially fitting that, in recognition of Muir's great public service to conservation through advancing the movement for the creation of forest reserves and national parks, the University of Wisconsin, many years after his regretful farewell, granted him her highest academic honor, the degree of Doctor of Laws.

"It is indeed fortunate and most appropriate that through the decades and centuries to come, the youth of the University may behold this beautiful bronze bust which has so faithfully caught the thoughtful countenance of Muir, as if in meditation upon the meaning of the order of the Universe--which so prolifically creates, which so lavishly destroys, and which through innumerable alternations of life and death in some mysterious way ever climbs to higher things." The bust is located in Birge Hall and carries the inscription, "A Priest at Nature's Shrine."

BOTANIZING ON MUIR'S LAKE

By Hugh H. Iltis, Curator
Herbarium, University of Wisconsin

There is much enjoyment in observing plants in Wisconsin. Since I was a newcomer to the state, anxious to learn the variety and whereabouts of Wisconsin's flora, I gladly accepted an invitation by Mr. Trenk to accompany him to the woods and waters of Muir's Lake. The two afternoons (July 14 and September 13, 1956) spent in surveying the plants of the area yielded a wealth of species and many botanical surprises. Among the 300 collections made were many new records for that part of Wisconsin, showing the area to be of unusual botanical interest.

1

2

3



Aerial view of area. 1) Cuff farm; 2) lake; 3) homesite.

apparently a hybrid between the Paper and Bog Birch; Nine Bark (Physocarpus opulifolius), Wild Phlox (Phlox pilosa); and several species of Aster, Violets (V. neprophylla, V. sagittata) and Bedstraws (Galium trifidum, G. labradoricum, G. boreale).

The alkaline, wet sedge-grass fen grading to damp prairie surrounding the lake is to me perhaps the botanically richest community in the area, aside from being, as Muir called it, a "Beautiful meadow lying warm in the spring sunshine." Some of the species include the Marsh Fern (Dryopteris thelypteris), the Osmunda ferns Osmunda regalis, O. claytoniana) which, together with many of the following, are listed by Muir in his charming description of the area in "My Boyhood and Youth:" Sandburg's Birch (Betula sandbergii), the latter

The late summer visit showed this meadow in its glory. Large numbers of pink Blazing Stars (Liatris pycnostachya), with a few scattered Bottle Gentians (Gentiana andrewsii) and Fringed Gentians (Gentiana procera) blanketed the northern end; in other places Grass-of-Parnassus (Parnassia caroliniana), the blue Lobelia kalmii, Ladies Tresses (Spiranthes cernua), Goldenrod (Solidago riddellii), Swamp Thistle (Cirsium muticum), and the purple New England Aster (A. novae-angliae) made a lovely sight. Among the many sedges (Cladium mariscoides, Rhynchospora capillacea, Carex interior and other ssp.) one, a most inconspicuous yet very abundant species with tiny pebble-like white fruits, proved to be a most exciting find, for this Whorled Nut Sedge (Scleria verticillata) had previously been known in the state from only one station in southeastern Wisconsin (Delavan, Walworth Co.).

The marly lake itself has some large colonies of yellow Spatterdock (Nuphar advena), two species of the carnivorous Bladderwort (Utricularia intermedia, U. vulgaris), and other pondweeds.

At the south end, bordering the meadow, is a healthy stand of Poison Sumac (Rhus vernix), from which all visitors will want to keep a healthy distance; then a steep, densely-wooded slope

with plants like Columbine (Aquilegia canadensis), Scotch Bluebell (Campanula rotundifolia), Sandwort (Arenaria lateriflora), Wild Geranium (Geranium maculatum), and probably many spring flowers which at our visit had withdrawn to their roots without a trace; and finally, on top of the hills above the lake, rather extensive, grazed "oak-openings" with some very sandy prairie. In the latter, Needle Grass (Stipa spartea), Side-oats Grama (Bouteloua curtipendula), Grama Grass (Bouteloua hirsuta), Jointweed (Polygonella articulata), Low Juniper (Juniperus communis var. depressa), and the pink Fame Flower (Talinum rugospermum) are abundant. On one open patch there survived, despite the grazing, some of the typical dry prairie species: Leadplant (Amorpha canescens), Prairie Cinquefoil (Potentilla arguta), Purple and White Prairie Clover (Petalostemon purpureum, P. candidum), Leonard's Skullcap (Scutellaria leonardii), the brilliantly-orange Puccoons (Lithospermum canescens, L. croceum), and a number of milkweeds (Asclepias ssp.), some of which are here at their northernmost recorded stations in Wisconsin.

A few prairie species, which apparently were exterminated by cows, still grow on the other side of the fence along the roadside of County Trunk F. Thus we may expect that such species as the beautiful silky Aster (A. sericeus), will re-seed within these 35 acres, provided the roadsides are not sprayed with 2-4-D. Now that grazing has been stopped and occasional burning is practiced, the prairie should rival the sedge meadow in color and abundance of flowers.

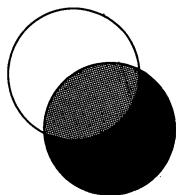
Many of the flowers listed by Muir were not seen. Of the Michigan Lily (Lilium michiganense), there was only one plant, and that in a roadside ditch off the grounds. The many orchids that Muir listed may still be there (or possibly on the other side of the lake which is still in private hands), and we shall look for them at an earlier season next year.

With his backyard containing such a great diversity of plant life, only a small portion of which is listed above, it is not surprising that young John Muir received the great stimulation that enabled him to become one of America's most influential naturalists and conservationists. It is therefore highly fitting to preserve this spot, not only for the inherent richness of the flora, but also as a memorial to a man with much wisdom and vision. The many interested persons and organizations of Marquette County, and all the others responsible for setting aside this living monument, deserve our sincere thanks.

###

ACKNOWLEDGMENTS in addition to those mentioned elsewhere--

The picture of John Muir at 23 years of age on page 57 is used with permission from the frontispiece of Vol. I of the Houghton Mifflin Publishing Company's copyrighted book (1923) by William Frederic Badger, "The Life and Letters of John Muir." The bronze bust of John Muir on page 59 is from the frontispiece of The Badger, Vol. 32 of 1918. ... Photo of the marble bust on page 58 is by George Richard, Editor of the Wisconsin Almanus. ... Aerial photo on page 54 by Tom Burgess of the La Crosse Tribune and photos on pages 64 and 69 (that of Frederick Logan) from the U.W. photographic laboratory. ... Photo of cover painting by Warren Schilder.



SOLAR ENERGY RESEARCH AT THE UW ENGINEERING EXPERIMENT STATION

By J. A. Duffie, Director
Solar Energy Laboratory
and W. R. Marshall, Asso. Director
Engineering Experiment Station

Late in 1953, the Engineering Experiment Station of the University of Wisconsin undertook an extensive program of studying engineering methods for utilizing solar energy in collaboration with Professor Farrington Daniels, Chairman of the Department of Chemistry, Professor V.E. Suomi of the Department of Meteorology, and other interested faculty members. The program is administered through the Engineering Experiment Station, and research is carried on in several departments of the Engineering College and in other laboratories of the University.

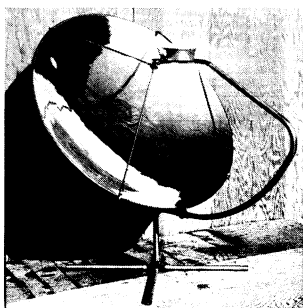
In the spring of 1955 the University received a grant of \$250,000 from The Rockefeller Foundation for studies of utilization of solar energy with particular reference to the undeveloped areas of the world where sunlight is abundant. This grant has permitted an accelerated research program which now has two major aspects: first, fundamental studies of methods of utilizing solar energy together with fundamental studies of measuring and recording solar radiation, and second, studies relating to the development of solar operated devices for use in non-industrialized areas.

At the present time, the Solar Energy Laboratory in the College of Engineering is engaged in the following studies:

1. The measurement and recording of solar radiation data, both as continuous records and as integrated values. Studies and interpretation of available radiation data are being conducted in cooperation with the Meteorology Department. These studies are important in designing solar devices for various parts of the world.
2. In an attempt to develop a low cost solar engine in the 1 to 5 horsepower range, emphasis is currently placed on studies of reflective type steam generators, and several non-conventional types of prime movers. These devices would be expected to find use for irrigation of land where water is required in moderate amounts at low pressures.

3. Absorption cooling for food coolers and for comfort cooling has received considerable attention, including consideration of intermittent absorption refrigeration cycles, studies of properties of various absorbent-refrigerant binary mixtures, and design studies of cooling units, specifically adapted to solar generation. If food could be refrigerated in tropical countries by solar energy, living and eating habits could be markedly improved.
4. Extensive studies of direct reflective type of solar cookers have been made, and a design incorporating a simple altazimuth mounting and plastic reflector has been developed. This device is shown in the figure. Field testing of solar cookers of the type shown has been started in Mexico and Colombia with the objective of obtaining information on the sociological problems involved in their acceptance and use, as well as on technological problems of design, materials, maintenance, and operation. Field test cookers have been placed in the hands of typical families in various parts of Mexico and Colombia where sunlight is generally prevalent, and progress in their use is being observed by personnel of The Rockefeller Foundation or cooperating agencies in these countries.

The current cooker design is the result of extensive studies of various materials of construction and methods of fabrication of reflectors. These studies and the collector so developed will also find use in the development of a solar steam generator, and solar absorption refrigeration. A 5 ft. collector of precision design is also on hand to obtain temperatures of several thousand degrees where the sun is focused to a spot only a fraction of an inch in diameter.



The cooker shown in the figure concentrates the sun's energy to an area about 3 inches in diameter. The reflector is about $3\frac{1}{2}$ feet in diameter. In bright sunlight, the concentrated energy will quickly ignite a piece of paper, and the heat is sufficient to bring a quart of water to boil in about 15 minutes. To ensure this rate of heating, however, the pot or kettle must be blackened to minimize reflection. Blackened pots were found to be readily available in the homes of the

families where the cookers have been installed. It is estimated that these cookers may reduce the family fuel consumption from 30 to 60% in certain areas of Mexico and Colombia. This is a significant economic advantage to the families which must pay 40% of their wages for firewood, or must spend two days a week collecting firewood at considerable distances from their homes.

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"SIFTING AND WINNOWING" PLAQUE REDEDICATED



On February 15 the famous "sifting and winnowing" plaque at the University of Wisconsin was rededicated. A copper chest, filled with historic books and documents, was sealed in the wall of Bascom Hall behind the plaque. Shown above are Prof. HELEN C. WHITE, chm. of the UW English Dept. and president of the Amer. Asso. of Univ. Professors, (principal speaker), and HELEN REHBEIN, Appleton, pres. of the Student Senate. Standing (L to R) are former Gov. OSCAR RENNEBOHM, a regent; JAMES S. THOMPSON, retired pres. of McGraw-Hill Book Co., of the 1910 class which presented the plaque; Prof. MERLE CURTI of the UW History Dept.; HAROLD KONNAK, Racine, Chm. of UW Board of Visitors; F. RYAN DUFFY, chief judge of US Court of Appeals, 7th Circuit, and president of the Class of 1910; ALFRED LUDVIGSEN of the governor's staff; LAWRENCE FITZPATRICK, pres. of the Wis. Alumni Asso.; Dean MARK H. INGRAHAM of the UW College of Letters and Science; Gov. VERNON W. THOMSON; and UW Pres. E. B. FRED.

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A GLIMPSE AT THE STATUS OF WISCONSIN ARCHEOLOGY

By Warren L. Wittry
Curator of Anthropology
State Historical Society

For obvious reasons, the areas occupied by prehistoric Indian cultures do not conform to modern political areas. Nevertheless, there has been a strong tendency to organize archeological field research by states and we would use the term Wisconsin archeology as a convenient reference to the study of prehistory in the area, knowing that it is intimately bound up with the archeology of neighboring states and ultimately with that of the New World as a whole.

Progress

However desirable it would be, an adequate history of archeological work in Wisconsin or a summary of the present picture cannot be given in this short space. There is a need, however, for some sort of resumé of past work and the results of it in order to point up the more serious gaps in our present knowledge and the major problems involved. This note does not pretend to entirely meet the need. Since progress in any endeavor can only be measured in terms of its aims and goals, we will set forth, briefly, the objectives and responsibilities of the students of Wisconsin archeology.

Specifically, they seek to determine what prehistoric cultures occupied the area and their distributions in time and space. They also want to know the nature of each culture and the relationships it had with other cultures and with the geographical environment. Simply stated, the final goal is to reconstruct as accurately as possible, what happened in Wisconsin during the 10,000 years when Indians were the sole occupants and how these developments figure in the broader picture of human history.

Most of this information can only be obtained through scientific excavation of archeological sites. It follows that the first task is to locate sites. This phase of the work was initiated by Increase A. Lapham in 1836. Many people, the majority of whom were not professional archeologists, have since contributed to the records of site locations and descriptions. Although there are sites in every county, our knowledge concerning the number and types of sites in each is extremely spotty. Several counties have been rather intensively surveyed, others are virtually unknown from an archeological standpoint. Coverage is best for the southern and eastern portions of the state.

Over 11,000 burial mounds have been recorded, with estimates for the total number running as high as 15,000. Although many have been destroyed, no other state can claim as many as Wisconsin. Some 200 have been excavated and the results reported in publications of the Milwaukee Public Museum and the Wisconsin Archeological Society.

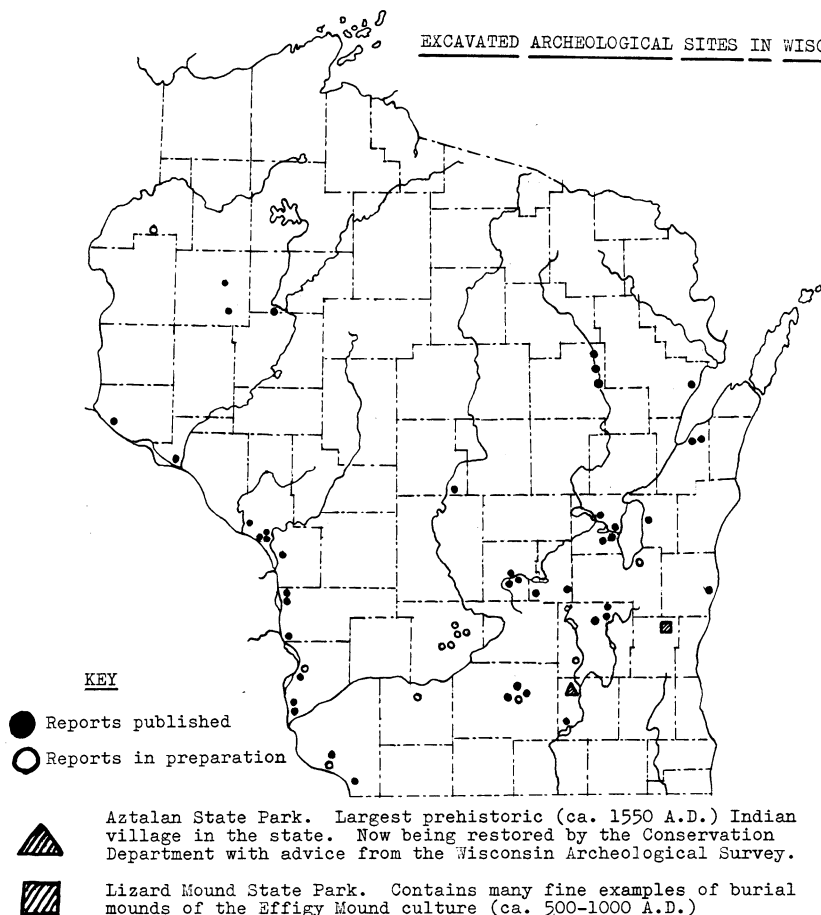
The accompanying map shows the locations of sites of all types where scientific excavations have been conducted. It covers the period from 1917 to the present. It is a bit misleading in that a single dot or circle may represent one mound or a group of mounds, a cemetery, a village site, or a rockshelter. In addition, at least six different cultures are represented but not differentiated. The map does serve the purpose, however, of depicting the locations and areas which have received subsurface investigations and which have not. A great deal of the work shown was done by the Milwaukee Public Museum under the direction of S. A. Barrett and W. C. McKern.

Since 1947, archeological work has been under the auspices of the Wisconsin Archaeological Survey. The present membership is composed of representatives of the following institutions: the State Historical Society, University of Wisconsin, Milwaukee Public Museum, Neville Public Museum (Green Bay), Beloit and Lawrence Colleges, Rock County Historical Society, Wisconsin Conservation Department, and the Wisconsin Archeological Society. Survey sponsored excavations have been conducted at Aztalan State Park, and in Pierce, Oconto, Dodge, Fond du Lac, Winnebago, Sauk and Iowa Counties.

Problems

The interested student could define many problems, but there are two which are particularly worthy of mention. The first is concerned with the rapid destruction of antiquities. Up until the turn of the century, agriculture was the principal grim reaper, leveling mounds and churning up village sites. Though the damage by the plow has continued, construction work has become an equally serious problem. The expansion of cities, the building of roads and dams, and the mining of gravel for materials are a few of the worst destroyers.

The second problem is actually a series of problems, all relating to how we can best go about achieving the objectives outlined above. We have the results of past work upon which the orientation of future work is partly based. A major weakness of the present picture is concerned with the dating of remains and the establishment of a more precise chronological outline of our prehistoric past. The recently developed radiocarbon method for the determination of absolute dates is the best technique

EXCAVATED ARCHEOLOGICAL SITES IN WISCONSINKEY

- Reports published
○ Reports in preparation



Aztalan State Park. Largest prehistoric (ca. 1550 A.D.) Indian village in the state. Now being restored by the Conservation Department with advice from the Wisconsin Archeological Survey.



Lizard Mound State Park. Contains many fine examples of burial mounds of the Effigy Mound culture (ca. 500-1000 A.D.)

In addition, mounds are preserved in Devils Lake, Nelson Dewey, and Wyalusing State Parks, and in many county and city parks.

at hand. So far, three dates have been determined on archaeological materials in Wisconsin. But the high cost of this method precludes a very extensive use so other means will have to be more fully utilized.

Prospects

The Federal-Aid Highways Act of 1956 contains a provision for the salvaging of archeological remains which



Excavation of deep stratified deposits found in some rockshelters in the Driftless Area will provide a good basis for a local chronology.

made for the seven major cultures now known to have inhabited the area. Recent work at stratified rockshelter sites promises to add clarity to the local chronology. Finally, archeologists are beginning to raise their heads out of their excavations. In doing so they have looked about and noticed that progress has also been made in related fields of botany, zoology, geography and climatic history. In the future the students of these fields should increase the cooperative studies already started toward the common aim of determining more about Wisconsin's prehistory.

#

WHAT IS OUR SOIL WORTH?

It is sometimes said that soil is Wisconsin's most valuable natural resource. Its worth in terms of dollars may be forcibly expressed by comparing the cash value of what it produces to that of some other natural resource. For example, if all of the world's gold mines were concentrated within the borders of Wisconsin, how might the production value...compare with that of her present soil? Startling as it may seem...the annual value of the agricultural products produced...greatly exceeds the annual market value of the world's gold production. Moreover, gold mines peter out...while soil when properly managed lasts indefinitely...-- Emil Truog, Devil River News, Brown County, August 28, 1956.

will be destroyed by the construction of highways under the program. The Wisconsin Archaeological Survey hopes to take advantage of this provision and salvage important information that otherwise would be lost forever. Apart from highway construction, there are still many sites destroyed each year which warrant investigation. At the present time there is very little facility to do this important work. It is estimated that already over half of our antiquities have disappeared and it is certain that those remaining are disappearing at an ever increasing rate.

On the brighter side, enough work has been done to construct a skeleton outline of Wisconsin's prehistory. Preliminary definitions have been

INTRODUCING — ARTHUR W. GREELEY

Regional Forester



ARTHUR W. GREELEY recently took over as regional forester for the North Central Region in the U. S. Forest Service.

Greeley, who came to Milwaukee from a similar position in Juneau, Alaska, is an old hand in the Service, though still a relatively young man. After graduating from the University of Washington, and from Yale, he started his career as a junior forester in the West where he worked in several Rocky Mountain states. He later saw duty in the office of the Chief of the Forest Service in Washington, D. C. From there, he went to California where he was supervisor of the Lassen National Forest, followed by an assignment as associate director of Forest Service research programs in the Pacific Northwest. It was from this position in Portland, Oregon, that he was promoted

to that of regional forester for Alaska in 1953. While in Alaska, Greeley played a leading role in the negotiating of timber sales that will finally make available much of the best timber resources of the southeastern part of the territory and which will result in much of that area being placed under active forest management for the first time.

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FREDERICK M. LOGAN — NEW ART EDITOR

FREDERICK M. LOGAN is the new Art Editor for the Review. At present Chairman of the Department of Art and Art Education at the University of Wisconsin, he began his career at Milwaukee State Teachers College in 1941. Appointed Head of their Division of Art Education in 1944, he came to the University in 1946 as assistant professor of Art Education. He served as chairman of the department from 1947-49 and from 1952 until the present. He became a full professor in 1954. A member of several Art Education societies, he is a Council Member, National Committee on Art Education, Museum of Modern Art. He has lectured extensively before State Art Education associations in other states and at several State universities. His book, "Growth of Art in American Schools," was published by Harper's in 1955 and he is also author of several articles and reviews. He was Editor and a contributor to a volume on the Arts for Child's World.



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In Memoriam

Rollin Henry Denniston 1874-1957

ROLLIN HENRY DENNISTON, Emeritus Assistant Professor of Botany, died January 27, 1957 in Winter Park, Fla. He was born at Campbellsport, Wisconsin on March 21, 1874. In 1911 he married J. Helen Dobson, who survives him. He is also survived by a son and a daughter.

After graduating in Pharmacy at the University of Wisconsin in 1897, Denniston completed work for the degree of Bachelor of Science in 1899. Continuing academic work at the University, he received the M.S. degree in 1901. Stimulated by the eminent cytologist, Professor R. A. Harper, and under his direction, Denniston in 1904 completed work for the doctorate in botany. His first teaching assignment was that of assistant in pharmacy, a position which also included responsibility for the Drug Museum--largely a collection of botanical pharmaceuticals housed at that time in North Hall. In 1903 he was made instructor in Pharmaceutical Botany, then instructor in Botany, and in 1907 Assistant Professor of Botany. For many years he gave instruction in the microscopical examination of foods and drugs of plant origin--a course designed primarily for pharmacy students.

In addition to his regular teaching duties extending through more than 40 years, he organized and offered various correspondence courses in botany for the Extension Division when that function of the University began to flourish. Among the professional scientific societies of which he was a member were the AAAS, Botanical Society of America, Sullivant Moss Society, and Sigma Xi. He was a charter member of the Wisconsin chapter of Sigma Alpha Epsilon. He joined the Academy in 1905, served as Treasurer from 1908-11 and became a Life member in 1948. Denniston was an enthusiastic participant in the activities of the Mushroom Club and the local Audubon Society, which group he served for a time as president. He can also be numbered amongst those who were responsible for the founding of the University Club and Memorial Union.

Professor Denniston's botanical interests were broad, and his own work as well as that of many senior students whom he guided reflected these varied interests. With an encyclopedic mind, he was a ready source of widely varied and miscellaneous botanical information. The result of one of his enthusiastic endeavors was a large collection of lichens to which he added continuously for years. It became a part of the University Herbarium upon his retirement. Besides various anatomical and taxonomic publications he was co-author of a widely-used textbook of general botany.

A kindly man, his colleagues and students vividly remember "Denny" as a beloved teacher and friend whom they deeply respected. MEMORIAL COMMITTEE: George S. Bryan, Herbert M. Clarke, Emma L. Fisk, Lowell E. Noland, John W. Thomson, Richard I. Evans, Chm.



WISCONSIN'S PORT RESOURCES IN PREPARATION FOR THE ST. LAWRENCE SEAWAY

By Harry C. Brockel, Municipal Port Director
City of Milwaukee

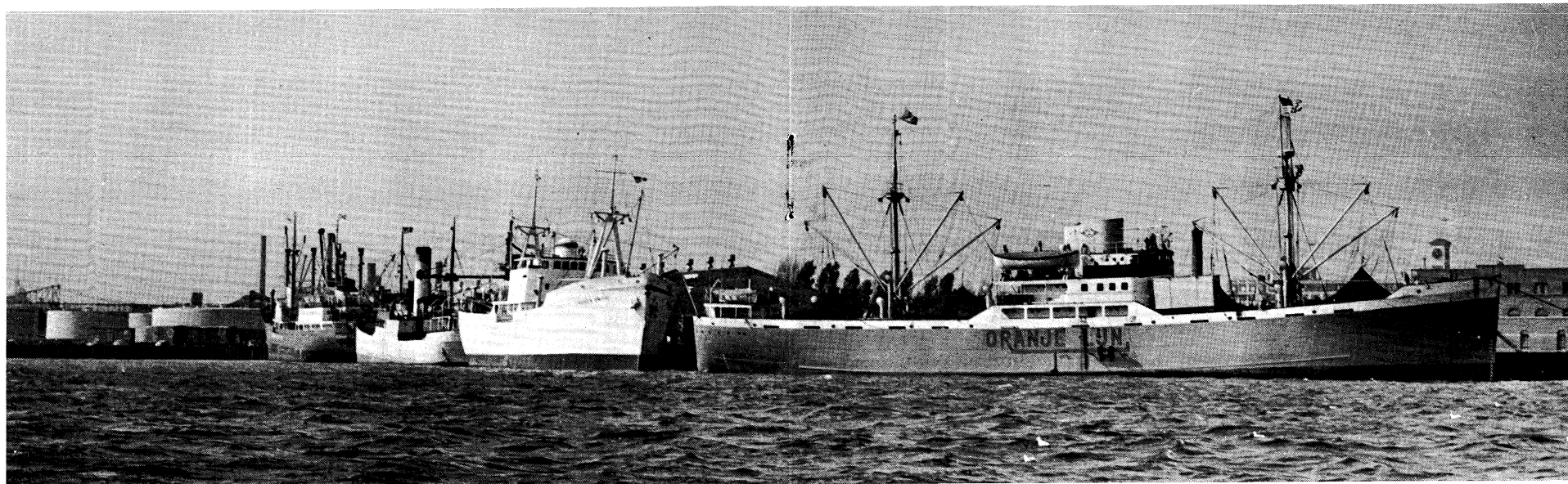
Wisconsin's vision of the St. Lawrence Seaway project, an economic objective of our state since 1919, is approaching realization. After decades of controversy in the halls of Congress and of negotiation with Canada, the monumental engineering task of building the Seaway is approaching the half-way point. Authorized by Congress in May, 1954, by August of that year the great shovels were at work in the valley of the St. Lawrence, and one of the greatest earth-moving and construction jobs in the history of the world was under way.

In April of 1959, the great new locks and canals of the St. Lawrence project will be opened to world commerce. For the first time in history the largest lake vessels will be able to move from the Great Lakes to tide water, and some 80 or 90 per cent of the world shipping fleets will be able to penetrate the fresh waters of the Great Lakes and to aid in the transformation of lake ports into sea ports.

North America is not likely to see again an engineering project as huge in scope and in cost as the billion dollar Seaway. As this monumental engineering task nears the half-way point, the businessmen, the economists, the transportation executives, and the men in the street, in Europe and Canada, in the United States, and particularly in Wisconsin, are asking, "How will the Seaway affect us?"

In the great dominion to the north, Canadian public opinion is almost unanimous that the Seaway will be the greatest single force in the development of Canada and the harnessing of her natural resources. Shipping executives in Europe, South America, and in our own country, are busily planning, forecasting, and designing ships for the unique new waterway extending 2400 miles into the heart of a continent.

Wisconsin, with its deep convictions concerning the merits of the Seaway, was a driving force and a major factor in ultimate approval of the project. The Seaway will probably be a decisive factor in the future economic development of our state, and of the Great Lakes area generally.



Four ocean vessels berth at Milwaukee Municipal

The Great Lakes area might well be described as a businessman's dream because it has so much to offer in the way of natural resources, climatic advantages, skilled labor, the world's largest supply of fresh water, the world's lowest-cost transportation, and a concentration of industrial and agricultural wealth which is the envy of the world. The Lakes themselves have been the great unifying force, and this natural highway has brought together smoothly and efficiently the region's rich resources of coal, iron-ore and limestone. These three basic raw materials, combined with fresh water supply and low-cost water transportation, made possible the greatest concentration of steel production and manufacturing enterprise found anywhere in the world.

In spite of the limitations of the existing 14-foot Seaway route, soon to become a 27-foot channel from tide water to Milwaukee, Green Bay and Duluth-Superior, a flourishing ocean trade is already developing on the Great Lakes and at Wisconsin ports. For example, 16 regular lines of ocean steamers are now serving the Port of Milwaukee, and a goodly number of new services are in the planning stage. Milwaukee Harbor had 225 sailings of ocean ships marked up in 1956. In ten years, ocean traffic at Milwaukee multiplied forty times in volume, from 2000 tons in 1946 to 82,000 tons of high-value commerce in

Transit Shed #1.

(Milwaukee Journal Photo)

1956. Cargoes have moved directly from Milwaukee to about 100 overseas ports on four continents since 1946.

The Wisconsin bank of Lake Michigan is beyond question the most strategic single area in relation to the Seaway, because of the deep and productive hinterland served by the ports on the west bank of Lake Michigan. During 1955, the three ports of Milwaukee, Green Bay and Chicago handled 60 per cent of the ocean commerce of the entire Great Lakes. No stronger evidence is needed to show how favorably Wisconsin is situated geographically to take advantage of the Seaway; to serve farms and industries lying between Lake Michigan and the Rocky Mountains; and to prosper from freight rate savings by use of direct ocean shipping as compared to the traditional rail-ocean routings through seaboard ports, with multiple handlings and multiple costs.

An infinite variety of raw materials, manufactured goods and farm produce already use the Seaway to link Wisconsin with overseas markets. Many basic raw materials and consumer goods reach the people of Wisconsin by ocean carriers. Manufactured goods and farm produce are already moving in impressive volume from Wisconsin farms and factories to overseas buyers.

During 1955 and 1956, the Port of Milwaukee alone served the import and export traffic of 120 cities in 18 western states between Wisconsin and the Rocky Mountains. Green Bay enjoys a modest volume of Seaway traffic and looks forward to a rising curve of ocean cargoes. Ship-building centers in Wisconsin, such as Manitowoc and Sturgeon Bay, feel that their economic future will be much brighter, with new opportunities to build or repair ocean bottoms, as well as traditional Great Lakes types of vessels.

Several well-situated Wisconsin ports should be prime beneficiaries of the Seaway project. A substantial new commerce of salt-water cargo should move through such ports, with added business for railroads, truck lines, stevedores, warehousemen, steamship agencies, brokers, banks, ship supply firms, and all of the colorful and varied enterprises involved in world trade and maritime activity.

Other Wisconsin ports will have more limited opportunities as Seaway terminal ports, but may well find that the Seaway will act as a magnet to bring new industry to the shoreline area. Waterfront sites for industrial locations will be in demand, and the advantages of lower-cost sites, fluid labor situations, and other factors, may well give the outlying ports and smaller industrial communities a real talking point.

The construction phase of the St. Lawrence Seaway and Power Project has in itself been a considerable stimulant to Wisconsin industry. Wisconsin firms are participating in the equipping of the great power stations which will harness the rushing waters of the St. Lawrence and put them to the service of man. Heavy machinery and earth-moving equipment, for which Milwaukee is famous, are being used in great numbers on the seaway job, and Milwaukee equipment is making a major contribution to the building of the St. Lawrence Seaway, as it did to the building of the strategic Panama Canal.

Briefly, the St. Lawrence Seaway should mean for Milwaukee, and to some extent for other Wisconsin ports, an expansion of port facilities; stimulated growth of rail, water and truck traffic; greatly increased waterfront and terminal activity of many kinds; and vital growth as trade and banking centers. Community income, payrolls and job opportunity will expand proportionately.

Realistic studies indicate that not all of Wisconsin's port cities should aspire to become ocean terminal ports. The smaller ports do not have the concentration of manufacturing and population to attract ocean liner

services. In many instances, the smaller ports will lack adequate channels, port facilities and service agencies for the handling of ocean ships and cargo. It may not be possible for such communities to finance major new port facilities. At most of them, the lines of communication run north and south along the Lake Michigan shore and they lack rail and highway access to the west, and therefore cannot serve any significant trade territory. However, the "out-ports" legitimately may hope for and seek substantial benefits from the Seaway development in the form of industrial plants seeking waterfront locations; by ship building and ship repairing; and by other "fringe benefits" which the Seaway should bring to the Wisconsin area.

As the great new waterway takes form in the valley of the St. Lawrence, remarkable progress is being made in other phases of the great task of opening the Great Lakes to world trade. Early in 1956, Congress with remarkable speed authorized the deepening of the connecting channels of the Great Lakes, to bring 27-foot navigation into Lakes Huron, Michigan and Superior. Congress also authorized a survey to determine the channel requirements of Great Lakes ports, and the U. S. Corps of Engineers with great dispatch has practically completed the first phase of this study, with opportunity for each of the Wisconsin ports to lay before the Corps the local conception of future channel and navigation improvements required to prepare these ports for the Seaway era. The U. S. Maritime Administration has declared the Great Lakes-European shipping route an essential trade route of the United States, setting the stage for American-flag shipping lines to join in serving the Great Lakes, and providing new lines between Lake ports and the harbors of the old world.

These bright forecasts may suggest that Utopia will automatically arrive in Wisconsin with the opening of the

Seaway in 1959. Economic appraisals of the Seaway should be predicted upon

long pull, rather than short-term considerations.

However, practically every economist who has

taken a look at the project seems convinced that the opening of a fourth seacoast along the boundary



waters between the United States and Canada will bring an era bright with promise for the Great Lakes region and for both nations. It seems beyond dispute that opportunity, both for the individual and for new commercial enterprise, will be more diversified in the Great Lakes region than ever before, recognizing the many new fields of activity which the Seaway will spark, and the many new openings for specialized services, as industrial lake ports become metropolitan sea ports. Industrial expansion should logically march hand in hand with commercial expansion.

One small cloud hovers over these bright horizons. The Mississippi Valley, the Chicago Sanitary District, and others who seek to divert waters from the Great Lakes Basin, for a variety of purposes, have at least temporarily complicated the situation with growing demands for use of lake waters to be removed from the Great Lakes Basin to other watersheds. Wisconsin and its port cities are in the front ranks of the fight against the famous, or infamous, "Chicago water steal" which has persisted for more than 60 years. Wisconsin and many other states and communities on the shores of the Lakes view with apprehension rising demands to take the waters of the Great Lakes from their natural beds, and lower the levels of the Great Lakes, at the same time that the efforts of decades are being realized and as new programs go forward to deepen lake channels and harbors and vastly increase the use of the Great Lakes for navigation, industry and human enjoyment.

Thus, while the Lake region marches unitedly toward the objectives of the Seaway, deeper channels, deeper harbors and ocean port status, they are also doing a "bit of family feuding" in trying to achieve an understanding regarding the best and highest use of this precious resource, and how its basic integrity may be preserved.

Author HARRY C. BROCKEL also is Vice-chairman of the Great Lakes Commission and Wisconsin representative on their Committee on Seaway and Navigation as well as a member of the Advisory Board of the St. Lawrence Seaway Development Corporation. This latter agency was created in 1954 to build and operate the St. Lawrence Seaway on the American side of the international boundary. He was one of the authors of the recent booklet published by the City of Milwaukee entitled "The Case Against Chicago's Water Diversion from the Great Lakes," from which is taken the sketch of the lakes used in this article.



DOMAIN OF LETTERS

Distinguished authors inspired to contribute during the celebration of an important anniversary in Madison not long since are Academy member EDWARD T. FAIRCHILD, who retired in January as Chief Justice of the State Supreme Court, and beloved Emeritus Professor CHESTER P. HIGBY of the History Department of the University of Wisconsin. Titles and contents of their contributions on succeeding pages are self-revealing.

The following poem representing a child's naively sagacious point of view is from a recent volume, "Moods and Moments," by Academy member LINDLEY J. STILES, Dean of the School of Education of the University of Wisconsin. It is published by permission. The book demonstrates how through veritable collaboration in writing about experiences intimately shared "one American family has found a way to strengthen ties and build lasting, common memories at a time when close family relationships are most difficult to maintain."

ON TOP

Wherever I am
I never stop
Trying to climb
To get on top.

On top the bed,
On top the chair;
I cannot wait
To see what's there.

I'm never happy
Unless I try
To reach the top
No matter how high.

When I grow up,
Will I ever stop,
Or still keep trying
To climb on top?

---Lindley J. Stiles

LAW AND POETRY

By Edward T. Fairchild
Former Chief Justice
Wisconsin Supreme Court

University Heights Poetry Club! Sixty years! The reminiscences of the only living charter member* give a television view of the Club's beginning. Neighbors braving the evening's dews and damp, guided by the dim and flaring lamp of the old oil lantern days always will be interesting. It may have been primitive, but surely it was legal, normal, and poetical.

We cannot help admiring the organizers of the Club--the sturdy men and their gentle ladies treading over the pathless meadows of The Heights in search of Pan, who by the alarm of Mrs. Browning had disturbed all the gods by proclaiming that he was dead. It was in this effort that this organization may poetically, if not actually, be said to have come into being.

I suppose the natural approach for me would be to express a sincere appreciation of membership in the University Heights Poetry Club. It is one of those creations which no matter what they are designed to do, dispel gathered gloom and furnish enjoyment in the company of congenial souls, and bring relief from trifling or serious daily affairs with an opportunity to look into "the full orb of Homeric and Miltonic Song."

It is not hard to conclude that there is an affinity between poetry and law. Neither seems to have a completed limitation. A person endowed with imaginative powers--emotional, intuitive, capable of expressing his conceptions, passions, intuitions in agreeable and musical language--may be a poet. But in dealing with more certain and definitive terms and with plainer facts, the same person may be a disciple of the law. ...

The sum and substance of these definitions seem to be that poetry is an attempt to peer into life's surroundings--seen and unseen, seeking opalescence and its play of colors in search of faith, inspiration, confidence, in search of something responding to our inborn aspirations, soul longings, as we reach for an understanding that will enable us to know the intangibles that weave themselves into the fabric of existence--material and spiritual and substantial--the source of contentment.

The urge of the poet somehow by means of or through his art finds expression in lyrics, epics, songs of praise--in comedy, tragedy with a very real and affirmative pressure as he touches the chords of hope incidental to faith and longing. It is thus we find the jewels of memories, diamonds of brilliance and inspiration, opals of golden thoughts transformed and made real by fashioned phrase, measured with feet and meter bringing self-contemplation and stimulated courage.

* - Mrs. A. K. Knowlton, now of Portsmouth, New Hampshire.

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On the ceiling of the Wisconsin Governor's Office antechamber appear these thoughts embellished in artistic lettering: "The Progress of a State is Born in Temperance, Justice and Prudence" and "The Will of the People is the Law of the Land."

HISTORY OF THE UNIVERSITY HEIGHTS POETRY CLUB

By Chester P. Higby
Professor Emeritus
Dept. of History, UW

The University Heights Poetry Club was founded in the autumn of 1896. ... At that time Madison was a town of about 16,000 inhabitants, but like most Western cities, was growing. Shrewd businessmen were organizing companies for the sale of lots. In 1893 such a company was formed to sell lots on University Heights. A distinguished university professor, RICHARD T. ELY, bought the first lot. In 1894 Mr. and Mrs. BUELL erected the first house in the new suburb. In 1895 the HILLYERS and the KNOWLTONS built homes there.

For the celebration of the 50th anniversary of the founding of the University Heights Poetry Club, Mrs. Knowlton, one of the original members, wrote down her recollections of the early days on the Heights. The sidewalks were wooden planks. At night people went around with the aid of lanterns. Windmills supplied most of the water. Soft water for laundering and for washing babies was obtained by melting lake ice. Most families had cows and horses.

In spite of the primitive conditions and the lack of modern gadgets America was astir intellectually. American society was reaching out for the new culture. Academic people were organizing national learned societies. Others sought culture through the Lyceum Movement with its lecture courses and discussion sessions and the Chautauqua Movement with its summer assemblies, home reading courses, and correspondence studies. Among those touched by the new intellectual currents were undoubtedly the new settlers on University Heights.

Probably the exact story of the founding of the University Heights Poetry Club will never be known. The writing of history is a difficult art and historians differ in their conclusions. Thanks, however, to one of the early members of the Club, the late Professor FLINT, there is a record of both the founding and the transactions of the club. According to this account the organization of the club was the result of a conversation between Professor Hillyer and Mrs. Buell. At first membership was confined to nine persons from five families on the Heights--the SMITHS, the HILLYERS, the BUELLS, the KNOWLTONS, and the ELYS. The first formal meeting was held on Hallowe'en at the home of Mr. and Mrs. Buell. Through the influence of Professor Smith the club decided to read British poetry. So the first evening Mr. Buell read aloud Robert Burns' "Tam O'Shanter."

The first members of the University Heights Poetry Club were a select group. AMOS ARNOLD KNOWLTON had been born in Boston and had spent his boyhood on a New Hampshire farm. He had graduated from Phillips Exeter Academy in 1882 and from Bowdoin in 1886. Later he had studied two years abroad. He had come to Madison in 1890 and was a member of the English Department of the University for ten years. His advice and his knowledge of English literature were of great advantage to the Poetry Club during the first years of its existence.

Professor RICHARD T. ELY was born in Ripley, New York. He had graduated from Columbia in 1879. When he came to Wisconsin

in 1892 he had already been a distinguished professor at Johns Hopkins for 11 years. He was one of the founders of the American Economic Association and first president of the American Association of Labor Legislation. He was an outstanding professor at the University of Wisconsin for 33 years and at Northwestern University for eight years.

CHARLES FORSTER SMITH was originally a Southerner from South Carolina. He had graduated from Wofford College in 1872 and later had studied at Harvard, Leipzig, and Berlin. Professor of Greek and Classical Philology at the University of Wisconsin, he was to be president of the American Philological Association in 1903 and later lecturer at the American School of Classical Studies at Athens. His wife had died in 1893.

Mr. and Mrs. BUELL were not officially connected with the University. He had been born at Sun Prairie. He had been a teacher and administrator in the public schools during the years he was getting started. Later he had graduated from the University of Wisconsin Law School. He was to practice law with great credit to himself for 43 years. His wife, who came from New York, was active in many of the social organizations of the city and state.

HOMER WINTHROP HILLYER was also from Wisconsin. He had been born at Waupun in 1859 and had attended Ripon College, the University of Wisconsin, and Johns Hopkins University. In 1896 he was an assistant professor of organic chemistry in the University of Wisconsin. Later he went into industrial chemistry.

The new poetry club prospered. During the first year of its existence five additional members were taken into the new society. Among them was A. S. FLINT, professor of astronomy, and his wife. They were the first members of the club who did not come from University Heights. By 1900, 27 more names had been added to the roll and seven members had withdrawn from the club. By 1914, 75 had joined and 24 had dropped out. Among the new names was that of JULIA F. SMITH, who came into the club in 1910.

The new members included many people of real distinction. Three of them were members of the State Supreme Court, but Judge STEVENS never attended many meetings. A surprising number of them were scientists. Among the names added, I personally noted WILLIAM B. CAIRNS, PAUL S. REINSCH, HENRY B. LATHROP, Mrs. AMOS P. WILDER, Mr. and Mrs. BEATTY, Mr. and Mrs. MCGILVARY, Mr. and Mrs. TURNEAURE, Mr. and Mrs. HOHLFELD, Mr. and Mrs. CHASE, Mr. and Mrs. ROE. The FAIRCHILDS joined in 1935, the NOLANDS in 1941, the INGERSOLLS in 1942. ...

During the last 60 years a great deal of poetry has been read by the club. From 1896 to 1915 it read Wordsworth, Browning, Tennyson, Keats, Shelley, Coleridge, Gray, Milton, Byron, Arnold, Pope, Dante, Meredith, Shakespeare, and a large number of Greek plays. Shakespeare was read twice, Arnold and Tennyson three times, and Browning four times. Later the Iliad and Odyssey of Homer, Shakespeare, Amy Lowell, William McDonald, Walt Whitman, Petrarch, Kipling, Goethe's Faust, a large number of Greek plays, Scott, Corneille, Racine, and Virgil's Aeneid were read.

The Poetry Club, however, was made up of very human people. At first Shakespeare was not read on the ground that amateurs could not do justice to the great plays. At one time the reading of Chaucer was abandoned because the language was too difficult

for club members. Another year the reading of Spencer's Faerie Queen was given up for no assigned reason. At one point in the records Professor Flint noted with evident satisfaction that "the reading of Paradise Lost and of Wordsworth's Excursion.... may well be regarded as marked achievements of the club. We have heard so much for many years past of the burden of reading the Excursion; but our members did not seem to find it tiresome, reading one book at each meeting." The same authority says that it was a "tradition fairly well maintained, ... that the selections assigned to be read shall not be so long as to weary the members who are listening." On another occasion there was what is described in the records as a revolt against reading Paradise Lost, but after considerable discussion the reading of the poem was continued.

From the first the Poetry Club recognized that man cannot live by poetry alone. Throughout its history food has played an important part in the sessions of the club. From the beginning refreshments of some kind were served to members at each meeting and the records are full of notices about buffet suppers, picnics, and more formal dinners. ...

On Saturday, November 2, 1946, the Poetry Club celebrated its 50th anniversary with another dinner at the Madison Club. The committee on arrangements consisted of ALFRED FLINT, Mrs. KNOWLTON, Miss UPFIELD, and Mrs. INGERSOLL. Judge FAIRCHILD arranged to have the dinner at the Madison Club. The program seems to have included the reading of letters from former members, the reading of selected poems by Mr. ROE, the reading of eight original poems by Professor NOLAND, and reading of Mrs. KNOWLTON's recollections of the early days of the Club.

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REDUCED PRICES - BACK ISSUES OF TRANSACTIONS

Back issues of the TRANSACTIONS of the Wisconsin Academy of Sciences, Arts and Letters are available through contact with Professor Charles L. Fluke, Room 206, King Hall, U.W., Madison 6, for the following prices, f.o.b. Madison:

- 1) There are seven complete sets of Vol. 1 through 45 which are available at \$100.
- 2) A run from Vol. 2 through 44 may be purchased for \$50 (the first volume is sold for \$50 as it is quite rare).
- 3) The following volumes are \$5 each because there are so few of them left: 2, 20, 29, 35, and 38
- 4) The following volumes are \$3 each because our supply is less than 50 or 60 copies: 34, 36, 37, and 39. Also Vols. 43 to date inclusive--the most recent ones--are \$3 each.
- 5) The remaining 32 volumes are available for purchase at 50¢ each.

The 50¢ per volume price on these 32 TRANSACTIONS is possible primarily because more copies than necessary are in stock. Members are urged to check the contents of these volumes and secure the ones they want before the surplus is liquidated due to the problem of storage.



JUNIOR ACADEMY NEWS

JUNIOR ACADEMY REPORT

By John W. Thomson, Jr., Chairman
Junior Academy Committee

The full series of spring meetings is now programmed for the Junior Academy. March 30 was the date for the northeastern district meeting at Appleton; April 13 was busy day with three district meetings, those at Milwaukee, Stevens Point, and Eau Claire. The state meeting at Beloit College on April 27 will be followed on May 11 by the Statewide Junior High School meeting at Appleton.

Several of the AAAS academy grants have been made by local committees thus far. Through the generosity of Academy member C. M. GOETHE, the AAAS annual grant of \$88 has been matched by a like amount, giving us a total of \$264 available for research support this year. A report on the projects obtaining support will be made at a later date.

The appointment of ROBERT DOUGLAS of Merrill High School to the Stevens Point area committee adds a very active science teacher to that committee. Mr. Douglas has been operating a local science exhibit for several years with some outstanding student science projects being shown at his school and at Junior Academy meetings.

This past February, a conference of Junior Academy sponsors was held at the University of Illinois, Navy Pier, Chicago, under arrangements by the Academy Conference of the American Association for the Advancement of Science. Among the 70 persons attending the conference were Miss MARY A. DOHERTY, Bradford High School, Kenosha, C. EMIL DUWE, Steuben Junior High School, Milwaukee, and JOHN W. THOMSON, University of Wisconsin. Discussions were held regarding communications among Junior Academies, their policies, organization of Junior Academies, interrelationships with other organizations, programs of the Junior Academies, and proposals for their development. It is expected that the results of this conference will be published and made available to those interested.

Wisconsin has another winner of the National Science Talent Search this year. For three years in a row, winners have come from Columbus High School, Marshfield. This year ROBERT ADLER is a winner and also won a \$400 scholarship award. Robert's science project was on electrophoresis of blood and his studies on blood from healthy and diseased patients proved so useful that his advice and help was used in studies at the local hospital. Honorable Mention in the National Search was earned by THEODORE FISCHER of Brillion High School, JOHN VEDDER of Bradford High School, Kenosha, EDGAR KOCH, Pulaski High School, Milwaukee, and MICHAEL NEUMAN, Shorewood High School, Shorewood.

The Seminar Club, Bradford High School, Kenosha, with the help of sponsor MARY A. DOHERTY is making a study of the careers of Junior Academy members. Questionnaires are being sent to all who participated in Jr. Academy sessions and Science Talent Search winners.

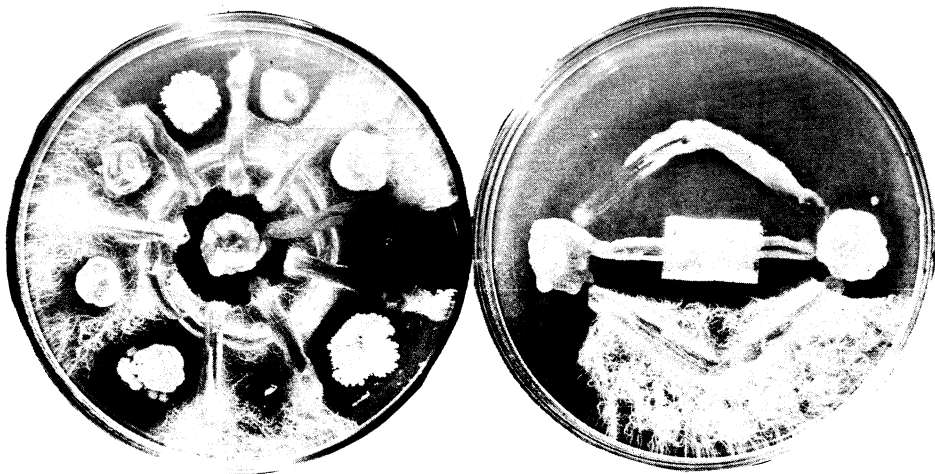
HUNTING ANTIBIOTICS

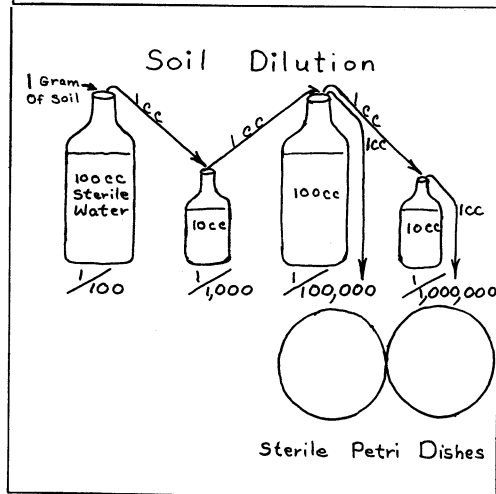
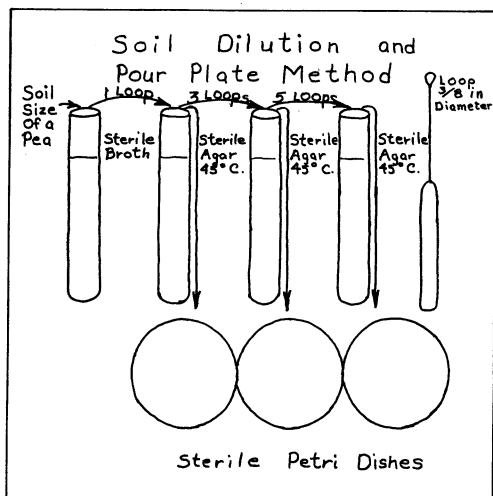
By Thomas H. Corbett
Appleton High School

An antibiotic is a substance produced by a microorganism that interferes with the growth and metabolism of other microorganisms, which gradually die. There are several types of microorganisms that produce antibiotics. They are bacteria, actinomyces, and molds. I have cultured 11 bacteria, and three actinomyce colonies which produce antibiotics. They were cultured from both soil and dust. I will go through the techniques used in obtaining and testing these antibiotics.

Since there are several million bacteria in each gram of topsoil, a dilution system must be used in plating soil. I used two methods for diluting soil. The first consists of diluting by bottles of water. One gram of soil is placed into a bottle containing 100 c.c. of sterile water. This bottle is then shaken well in order to shake the organisms loose from the soil. Then 1 c.c. from this suspension is poured into 10 c.c. of sterile water, flaming the lips of the bottles before making the transfers. This process is continued until dilutions of 1 to 100,000, 1 to 500,000, 1 to 1,000,000, and 1 to 10,000,000 are made. Then 1 c.c. from each is poured into sterile petri dishes. Then sterile melted agar cooled to 45 degrees C. is poured over the diluted soil and swished around in order to get an even distribution of organisms throughout the plate. Care must be taken in controlling the temperature of the agar, if the agar is cooler than 45 degrees C. it will solidify and if it is much warmer, it could be injurious to the organisms. The plates are then allowed to solidify, inverted, and incubated at a temperature from 25 degrees C to 37 degrees C.

The second method used is diluting directly into the test tubes of agar. A small amount of soil, about the size of a pea, is placed into a test tube of sterile nutrient broth. This is then rolled in order to accomplish the same purpose as shaking the bottles of water. Then one loop of this is transferred into a test tube of sterile melted agar cooled to 45 degrees C. Three





loops of this are transferred to another test tube of agar and five loops from this test tube into a third test tube of agar. These test tubes of agar are then poured into sterile petri dishes, allowed to solidify, inverted and incubated. In order to avoid outside contamination in this method, the lips of the test tubes are flamed and they are also held on a slant.

In plating dust, sterile melted agar is poured into a sterile petri dish. It is then allowed to solidify. The lid is raised slightly and a small amount of dust is blown into the petri dish. The dish is then inverted and incubated.

After the colonies develop a ring can be observed around an anti-biotic colony if there is a spreading bacteria in the plate or if the colonies are close together. If the colonies are too far apart to observe a ring, a weak spreading test bacteria can be inoculated into the petri dish and inoculated into another petri dish, and then tested against a spreading test bacteria. You cannot expect to find an antibiotic in every

plate and even when one is found it is many times too weak to be of any use. Also many times the antibiotics are overrun by a type of mold which is present in soil and dust that produce hypha. This plating process must be repeated over and over again using different kinds of agar, different kinds of soil, and different dilutions.

I use three types of agar for my work. They are nutrient agar, with a pH of 6.8, the same agar only adding 1%, 2%, or 3% glucose or dextrose to it, and Sabouraud Dextrose Agar with a pH of 5.6. One thing I have noticed is that a colony will not always do as well on one type of agar as another type of agar.

When an antibiotic colony is obtained, the next step is to make a pure culture of it. Sometimes when a colony develops in a petri dish it is not in contact with any other colony in the plate; in this case you can be reasonably sure that the colony is

pure. However, to make sure a colony is pure it is diluted and replated on the type of agar most favorable for its growth. There are two common methods which I use for this purpose: first, the pour plate method, and second, the streak plate method. The pour plate method is the same as the soil dilution method of diluting into the agar. The streak plate method consists of streaking a small amount of the mixed culture back and forth across two sterile petri dishes.

After a pure culture of the antibiotic is obtained it is then tested on several types of test bacteria. This I do in two ways. The first is placing a portion of the pure culture near the edge of a petri dish, then streak several types of test bacteria up to the streak. Some bacteria will be more resistant to the antibiotic and thus will grow closer to it.

It is quite easy to distinguish an actinomyce colony from a bacteria colony. An actinomyce colony is very tough and is not easily broken apart and also adheres to the media, whereas a bacteria colony is soft and doesn't adhere to the media. Further examinations are done under a microscope. Bacteria appear in three common forms although I have found them in only two. They are bacilli, rod shaped, cocci, round, and spirilla, comma shaped cells. An actinomyce cell appears long and threadlike, showing considerable branching. In identifying a microorganism further they are run through a series of tests. According to the results of these tests they are classified in the Bergey's manual.

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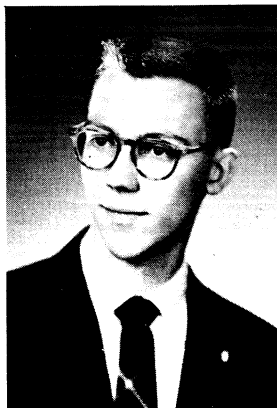
A CONTINUOUS CLOUD CHAMBER

By R. W. Stubbe

Washington High School, Milwaukee

Introduction: As a fulfillment of a physics course requirement by Mr. Suchy of Washington High School, I decided to construct a continuous cloud chamber to render visible the tracks of sub-atomic particles as they passed through a super-saturated aerosol.

Apparatus: The cloud chamber proper consisted of a lucite tube with aluminum plates placed at the top and bottom to conduct heat. In order to insure airtightness, rubber aeronautical "O-rings" were placed in the top and bottom plates in contact with the edges of the tube. At the top inside of the chamber, fastened to the top plate was a $\frac{1}{2}$ inch thick piece of vellum to prevent direct contact of the alcohol-containing felt.



Methyl alcohol was placed in the felt which was attached to the top plate by a pipe tap located in the top Al-plate.

There were two heating elements. The first was placed on the top-outside of the top plate to warm the top plate. The second, a pencil-shaped element, protruded directly through the

Al-plate and the felt. This was the element responsible for the major vaporization of the alcohol. It was separated from the Al-plate by a transite tube. The alcohol then vaporized and traveled downward through the air-tight container. Since the chamber rested upon a cake of dry-ice, the aerosol became super-saturated by the time it reached the bottom of the chamber. When sub-atomic particles passed through this super-saturated aerosol, they caused tracks which were made visible under moderately powerful illumination.

A magnetic sweep field was supplied by two coils containing a total of 1300 turns of #24 Cu wire, giving a resistance of 36.7733Ω . The coils were wound on paper to facilitate easy removal and were covered with black plastic tape.

The radioactive source employed was a sample of Ra-salt mounted on a pin which was stuck in a cork of a glass vial. Around a covering tube were placed 500 turns of #30 Cu wire (Ohmage--17.1717).

Procedure: Because the interior of the chamber acquired white blotches in early trials due to the use of commercial rubbing alcohol, the interior wall was first coated with a thin coat of mineral oil.

A cake of solid CO_2 , approximately 1x4x5 inches, or 1 lb. was wrapped with three thicknesses of newspaper. The chamber with the top plate removed was then set upon the insulated dry-ice, and allowed to remain for about 10 minutes. After this time, the felt on the top plate was thoroughly saturated with methyl alcohol and fastened to the top of the chamber.

Heating element #1 was turned on until the top plate became warm and was then shut off. Heating element #2 was then turned on for but a few seconds whereupon the whole chamber became filled with a cloud. (A cloud did not form using only heat from source #1.) After this formation, heater #2 was turned off and the chamber allowed to rest for about $1\frac{1}{2}$ minutes to quiet the convection currents. Upon application of a moderately powerful light source, the tracks became visible.

Although ethyl alcohol in the form of commercial rubbing alcohol was first used, it caused damage to the tube by causing blotches and thus impairing visibility. Therefore, in subsequent trials, methyl alcohol was used and the interior wall coated with mineral oil.

At this point the magnetic circuit is set up with an ammeter to make the tracks assume curved tracings. However, I have not performed this operation as yet. In future trials, I also intend to try two other experiments:

1) To use CO_2 gas instead of air with the methanol as described by Langsdorf in A.E.C. Report UCRL-2412, Part B. "A Diffusion Cloud Chamber of Unusually Large Dimensions (thesis)".

2) To use polarizers and a carbon arc to determine the best illumination for viewing the tracks.

Data: Magnetic Circuit

	<u>turns</u>	<u>length-ft.</u>	<u>area of cross section</u>	<u>R.</u>
Coil #1	925	998.9075	53.4293 sq. in.	26.1714 Ω
Coil #2	375	404.9625	53.4293 sq. in.	10.6100175 Ω
Total	1300	1403.9500	53.4293 sq. in.	36.7835 Ω

Radioactive Source

<u>Content</u>	<u>14 ppm.</u>	<u>material</u>	<u>length</u>	<u>R.</u>
<u>Coil around source</u>				
1		#30 Cu.	163.54 ft.	17.1717 Ω

<u>Material</u>	<u>length</u>	<u>Tube</u>		<u>Thickness</u>
		<u>O.D.</u>	<u>I.D.</u>	
Lucite	5.625 in.	3.9687 in.	3.4638 in.	0.25 in.

	<u>Name</u>	<u>Heat Sources</u>		<u>E.</u>
		<u>I</u>	<u>P-watts</u>	
Element #1.	1V47 Chromolox	2.17 amps	238.67	110 V. a.c.
Element #2.	7173-B	5.96 amps	80.00	17.3V. a.c.

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U.W.-MILWAUKEE GRANTS FIRST DEGREES -- The first 87 students received bachelor's degrees from U.W.-M. on February 9, 1957. They included 77 B.S. and 10 B.A. primarily for Milwaukee area individuals.

SUPPLEMENT to State and Academy News (from page 94)

Organizational Positions - Academy members on the Board of the Wisconsin Society for Ornithology include: President HAROLD G. LIEBHERR, Vice-president FRANK H. KING, Treasurer CARL P. FRISTER, Mrs. R. P. HUSSONG (publicity), J. ALLAN SIMPSON (legal counsel), GERALD A. VOGELSONG (conservation), HOWARD YOUNG (research) and HAROLD G. KRUSE (supply dept.). ... Academy men active in leadership of the Wisconsin Archeological Society include Vice-president D. A. BAERREIS, Director and Editor ROBERT RITZENTHALER and Advisory Council members E. G. BRUDER, W. C. MCKERN, CHARLES G. SCHOEWE and WARREN WITTRY. ... Academy members active in administering the U.W. Arboretum include Executive Director G. W. LONGENECKER, Research Coordinator J. T. CURTIS and Editor of the Arboretum News, H. C. GREENE.

A special sub-committee of the Natural Resources Committee of State Agencies to study water use legislation includes Academy members GEORGE F. HANSON, RAYMOND J. PENN, GEORGE E. SPRECHER, ROY G. TULANE and THEODORE WISNIEWSKI. ... Madison will be host to the 82nd national meeting of the American Forestry Association, Sept. 30-Oct. 3 with WILLIAM J.P. ABERG acting as general chairman and other Academy members on the executive committee including JOHN A. BEALE, ALLAN S. HAUKOM, A. E. SWANKE and FRED TRENN. ... LINDLEY J. STILES recently was elected President of the National Society of College Teachers. ... CHARLES N. LLOYD is an Associate Editor of The Progressive Fish Culturist and Chairman of the Upper Mississippi River Conservation Committee which will hold its 14th annual meeting at Minneapolis, January 7, 1958. ... Academy members on technical committees of this organization include: KENNETH MACKENTHUN (Chm. Pollution), EDWARD SCHNEBERGER (Chm. Publications), FRANK KING (Game) and GEORGE E. SPRECHER (Special Com. on Value of a Law Enforcement Committee). ... CYRIL KABAT is national chairman of the Land Classification Committee of the Soil Conservation Society of America and also a member of the Flyway Management Plan Committee of the Mississippi Waterfowl Flyway Council (technical section).

Publications of Interest: "Oak Wilt" by J. E. KUNTZ and A.J. RIKER (UW Expt.Sta.Bull. 519); U.S. Fish and Wildlife Service Research Reports No. 42 and 44 on "Biology of Young Lake Trout in Lake Michigan" and "Biology of the Sea Lamprey in Its Parasitic Phase;" "Wisconsin vs Other States" by Governor's Committee on Revenue Sources (Gov. Office, Capitol) and "Boating Guide to Wisconsin" from Johnson Motors Co., Waukegan, Ill. (25¢). ... Academy member FARRINGTON DANIELS was one of five UW professors who collaborated on the revision of the textbook, "Experimental Physical Chemistry" (\$6.50--McGraw-Hill Co.) recently.

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THE BOOKSHELF

WISCONSIN'S RENEWABLE RESOURCES

Edited by James A. Larsen

University of Wisconsin
News Service
Observatory Hill Office Bldg.
Madison 6, Wisconsin
1956 160 pp., illus.

(A Report on Research at The University of Wisconsin into the Renewable Resources of Field, Forest, Lake and Stream. Published by the University of Wisconsin with funds supplied by the Wisconsin Alumni Research Foundation)

University scientists have contributed knowledge and understanding of state resources through research, and this attractively designed, handsomely illustrated, flawlessly printed, and readable book is a popularized summation of their work and the background for it. Primeval conditions in Wisconsin are described, various resource problems which have arisen under civilization are discussed; the main theme is the university's predominant part in the research attack on them. The three major parts deal with vegetation and background, wildlife, and with waters and aquatic biology, in that order, with special chapters on deer, grouse, waterfowl, plankton, algae, the Brule River, etc. An attempt is made to summarize existing knowledge on each such subject in a few paragraphs, then to state problems, and tell what the university has done to solve them. The book is evidently arranged to serve as a sort of beginner's text on Wisconsin conservation as well as to present the university research story. Researchers on the campus are engaged in a great variety of projects; interesting, useful, valuable, and deserving of support. On this, readers will agree as they read and profit from science editor Larsen's book.

The book, however, tends to claim the moon for the university, and to be somewhat unfair. The general text includes information from many researches outside the institution, some specifically referred to, some not, under no discernible pattern of inclusion or rejection. "For historical perspective," the writings of early-day naturalists are extensively covered, thereby incidentally bridging a substantial void when the university was little interested in such matters. This perspective is then dropped. The book cannot fail to give most readers an exalted idea of university natural resources work, inadequate appreciation of other Wisconsin work. For example, the Conservation Department is mentioned as having conducted "a great deal of research" on deer, yet no mention is made of individual researchers, nor are their publications cited in the deer chapter references, although their findings are freely used without identification. The list of university references, in fact, shows comparatively little institution field work on deer.

Similar instances are numerous. University research is seldom allowed to stand on its own feet, while the extent to which it leans on other work in Wisconsin cannot be guessed unless the reader has independent knowledge. So little more would have been needed to have made the book comprehensive--to have made it a Wisconsin book--that one wonders why this was not done.

Excess fervor in support of the university characterizes the book. Thus the claim is flatly advanced (p. 58) that "the applied science of wildlife management was born in the 1930's", and also, ("few would dispute") that "its birthplace was Wisconsin." The facts are incontrovertible that the university is wrong on both claims. The applied science of wildlife management was born in the previous decade (in 1925) under the auspices of the then U. S. Biological Survey and a group of private landowners who formed The Cooperative Quail Investigation in the Southeast. Chosen to conduct the work was Herbert L. Stoddard, an adopted son of Wisconsin, then with the Milwaukee Public Museum, never with the university. His pioneering research, in Georgia, Florida, and the Southeast, his application of it to quail increase, showed so much soundness and breadth of ecological approach, and was so mature and modern, that it remains classic work seldom if ever equalled by any university. Stoddard, however, merits one parenthetical reference in the university's book (a then-graduate student confirmed one of his findings), nor is the contribution of Dr. E. W. Nelson, or of others connected with the undertaking, acknowledged as the university seeks to stake its claim on the whole mountain.

Subsequent wildlife management interest at Madison derived from and depended upon the work of the Cooperative Quail Investigation. It is factually impossible to post-date the birth of this applied "science" to the Leopoldian era. Neither his revered name nor the stature of research at the University of Wisconsin need rest on such claims.

Similar fervor (for want of any other explanation) places rural zoning (Chapter Nine) as an accomplishment in the research field, apparently in the same category as the work of Birge and other university greats. The statement (p. 153) "Wisconsin's rural zoning program was the result of practical application of the principles of forest ecology to land" is simply jargon. Whatever one may think of rural zoning (there are two sides to it, although this glowing appraisal presents only one), social planning based almost solely upon urban-minded concepts of "economics" has nothing to do with the principles of forest ecology, which, after all, are not even man-made.

In this connection, there is no reference to Bulletin 358, U. of W. Ag. Exp. Sta., Drainage District Farms in Central Wisconsin, Jones and Packer, 1923, or to other past and present university work proceeding in a quite opposite direction. The fact that the necessity to institute special state programs to preserve prairie chickens and sharptailed grouse is in any manner related to events under rural zoning is not even mentioned. Although there is discussion of "multiple use," the real basics are not discussed, nor is there any indication that the institution has in progress any program of coordination which might utilize the good of Bulletin 358 and of zoning under a balanced plan of action more adequate to the needs of the state. Perhaps of necessity, the book is too compartmentalized to offer any reconciliation of opposed features of the institution's work as a whole.

As a recital of the results of university research (where the presentation permits separation of these from other material)

the book is interesting and will have non-critical public acceptance. It is, however, in some respects disquieting to more specialized supporters of the University of Wisconsin and its work.

-- Wallace B. Grange, Babcock

SPRING FLORA OF WISCONSIN

By N. C. Fassett

University of Wisconsin Press
430 Sterling Ct., Madison 6, Wis.
1957 200 pp., index, illus.
\$2.50

This is the third edition of the popular reference to the spring flowering plants growing without cultivation in Wisconsin. Originally printed in 1931, it was reprinted in 1938 and revised in 1947. The popularity of this book in the past is attributed not only to the author's vast knowledge of vegetation, but also to the simple yet scholarly style in which it is written. Additional knowledge concerning new records of plants in the state as well as nomenclatorial changes made this edition necessary. Professor Fassett was unable to complete this revision before he died. His colleagues, particularly Mrs. Margaret S. Bergseng, completed the task in a manner consistent with his high standards.

To the person unfamiliar with this book, the introductory pages describe classification of plants, use of keys, and collection and mounting of plant specimens. The keys are relatively easy to use, and the illustrations emphasize the diagnostic characters. A glossary is provided to aid in the understanding of botanical terms.

New addition of plants not reported previously include one family, five genera, 20 species and eight varieties. Changes in nomenclature (mostly according to Gray's Manual, ed. 8) affect two families, ten genera, 35 species and 17 varieties. The most extensive changes have been made in the Violaceae (Violet Family). The section pertaining to the stemless blue violets has been revised in the key, and the Viola cucullata complex has been separated into four species.

This edition, although slightly smaller in size than the earlier ones, is printed on the finest quality paper, with improved size and style of typography. The cover, however, is not of the firm quality of the earlier books and may not wear well, particularly with intensive use in the field.

The professional botanist will be delighted with the book; the amateur botanist or naturalist, if willing to learn its contents and the use of keys, will find it indispensable in his field work. -- Peter J. Salamun, Dept. of Botany, UW-M

A MANUAL OF AQUATIC PLANTS

By N. C. Fassett

University of Wisconsin Press
430 Sterling Ct., Madison 6
1957 405 pp., over 200 full-page line drawings + others,
newly indexed \$6.50

This is a revised edition of an excellent manual that was first published in 1940 by McGraw-Hill. Professor Fassett* had long entertained the idea of publishing a manual of aquatic plants that would be useful to technicians in the field of wildlife management, forestry, soil conservation, aquatic biology and

* - Late Professor of Botany, University of Wisconsin

related fields. Prof. Fassett, a very competent taxonomist, assembled and compiled simple but accurate artificial keys together with over 200 full-page line drawings and many smaller drawings and photographs which aided the worker in identifying most macroscopic water plants whether sterile or flowering. In writing this book, Dr. Fassett defined an aquatic plant as one "that may, under normal conditions, germinate and grow with at least its base in water and is large enough to be seen with the naked eye." The region covered ranges from Minnesota to Missouri and eastward to the Gulf of St. Lawrence and Virginia. The flora of bogs, small woodland brooks, waterfalls, and tidal salt and brackish water is not included.

Part I includes a general key, based entirely on vegetative characters, which leads to the family, genus or species name; Part II, includes a descriptive treatment which is primarily a key to genera and species under each family. In some cases, the use of flower or fruit characters is needed. A short statement of habitat and range is given for many species.

In the appendix, the aquatic biologist and wildlife manager's interests are considered in a compilation of the uses of aquatic plants by birds and mammals (by Frederick and Frances Hamerstrom) and of the relations of plants to fish (by Carl Leopold and Roderick Huff).

The new edition features a revision appendix by Eugene C. Ogden, State Botanist, New York State Museum and Science Service. He has brought the nomenclature into agreement with present-day usage when keying out plants as presented by Fernald's revision of Gray's Manual, Gleason's revision of the Britton and Brown Illustrated Flora, Muenscher's Aquatic Plants of the United States, and by recent local floras and monographic treatments, including several by the late Prof. Fassett. In addition to this, Dr. Ogden has supplemented some keys (including Potamogeton and Polygonum) and noted the extended range of many species. There is a glossary and the text and appendix are newly indexed. This revision will be welcomed by student and field technician alike.

--- F. R. Zimmerman, Wis. Conservation Dept.

THE CRAFT OF OLD MASTER DRAWINGS

By James Watrous

University of Wisconsin Press
430 Sterling Ct., Madison 6
1957 170 pp., illus. \$10.00
Special Student Edition \$6.50

For considerably more than a decade University of Wisconsin art students have been able to study the practices, as well as the history of the drawing media of the Western world.

Prof. James Watrous, the author of The Craft of Old Master Drawings, conducts a laboratory-history class in which he is never able to accommodate all the students wishing to enroll. This book presents the research developed over the years, which has made that course a unique offering in a department of art history.

The author is a painter and draftsman. He is best known as a muralist, having in recent years completed murals in combinations of painting and drawing media and, more recently, in mosaic in the new Commerce Building. He is just as thoroughly a historian and scholar, else the quality of this volume could never have been achieved.

There are two parts in the book: Part one, the fine drawing

media, and Part two, the broad drawing media. Part one includes metalpoint drawing, chiaroscuro drawings, pen drawings and inks for drawing. Part two deals with chalks, pastels and crayons, and charcoal and graphite. An appendix refers to sources of materials.

In each section a condensed history of the media is presented in such a way as to become also a guide to the range and the possibilities of that particular media for the present-day artist. Each section closes with workshop procedures which present working directions derived from historical background and present-day laboratory research in the preparation of media as well as grounds on which to do the drawings.

This is an important volume on the fundamental craft common to all artists. It is interesting that Watrous offers no observations on contemporary art controversies even indirectly. The drawings selected for illustration, Holbein or Henry Moore, and the direct concentration of the text, admit of no controversy in assuming that drawing has for some time been, and will continue to be, a craft of significance and beauty when it is practiced by artists.--Frederick M. Logan, Dept. of Art & Art Education, UW

THE NATURAL RESOURCES OF WISCONSIN

By Natural Resources Committee
of State Agencies

Bureau of Purchases
State Capitol, Madison, Wis.
Dec. 1956 159 pp. 75¢

This is the first significant publication of the Natural Resources Committee of State Agencies which was created by the Wisconsin Legislature in 1951. It was edited by the Secretary, M. W. Torkelson. Besides its 17 members representing the several State agencies interested in natural resources, 70 other individuals who helped on this project (members of subcommittees, working groups and the agency staffs) are also recognized.

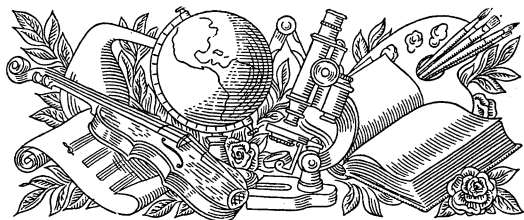
In 1945 the State Planning Board issued their Bulletin 16, "A Picture of Wisconsin," which is expanded and brought up to date by this new report. Illustrated with 39 well chosen photos, 23 maps and numerous drawings of fish and other wild game animals by Charles W. Schwartz, the book also is a storehouse of information summarized in 58 tables. Five main parts deal with general characteristics of the State, statewide public facilities, the land resource, the water resource and conservation education. Subjects include physical geography; climate; recreation and scenic beauty; wildlife; highway, navigation, railroad, aeronautical, natural gas, telegraph and electrical energy facilities; soils; drainage and irrigation; forests; zoning and land use planning; minerals; surface waters; ground waters; sanitation and water pollution control; hydro power; floods and flood control; conservation education and its legal basis, its status and agencies and institutions concerned in this field.

About 33,000 copies were printed but only 2,000 were distributed free to schools, libraries and the agencies concerned. The remaining copies are for sale as indicated above unless a bill now being considered by the Legislature releases more free copies for distribution by the Supt. of Public Instruction and the N.R.C.S.A. Secretary. For anyone interested in Wisconsin natural resources, this publication is not only well worth the price--but it is indispensable.

-- W. E. Scott, Wis. Conservation Dept.

Article Note: AUDUBON MAGAZINE has published, in two parts, "The Return of the Vanishing Musk Oxen," by HARTLEY H. T. JACKSON. Part 1, vol. 58, pp. 262-265, 289, illus., Nov.-Dec. 1956; Part 2, vol. 59, no. 1, pp. 26-29, illus., Jan.-Feb. 1957.

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STATE AND ACADEMY NEWS

NEWS NOTES FROM CARROLL COLLEGE

Collected by Prof. Roy J. Christoph (Review Reporter)



A new \$900,000 commons-union building was viewed by 1500 visitors at an open-house held February 3. The building was designed by FRANK C. SHATTUCK, college architect. Refectory facilities had been in operation since the start of the school year, but lounges, ballroom, book store and meeting rooms were placed in service officially for the first time at the open-house. ... Students in advanced geography courses under the direction of Professor BENJAMIN F. RICHASON have taken to the field for theoretical and practical problems. One group is attempting to determine the existence of a Welsh "cultural island" in the morainal area of western Waukesha county, while a second group is mapping land use in New Berlin township. The latter project is being done for the office of the Waukesha county planner. ... Professor RICHARD L. BURDICK of the education department represented Carroll at an academic conference held March 1, 1957 at Lake Forest college as part of the Illinois school's centennial celebration. Theme of the conference was, "The Proper Function of the Liberal Arts College." ... President ROBERT D. STEELE is now serving as president of the Waukesha Chamber of Commerce.

A committee composed of faculty, trustees and alumni has selected a Schulmerich carillon as a memorial to the late Prof. VINCENT P. BATHA, long-time professor of physics. The unit will be installed in time for use at commencement, June 9th. ... Professor ROY J. CHRISTOPH will be Visiting Lecturer in botany on the 1957 summer session staff of the University of Wisconsin. ... Academic Dean MERTON D. MUNN is leaving in June to assume the duties of Dean of the College of Liberal Arts and Sciences at Silliman University, Philippine Islands. ... "Three Evenings with the Arts" is the title of a cultural series planned for the new commons-union in cooperation with the Commission on Arts of the Association of American Colleges. Argentine pianist Raul Spivak opened the series on March 7th. Harriet Fitzgerald, director of New York's Abington Square painters, lectured on "The Art of the 1950's" on March 21st. Soprano Ann Moray closes the performances with a recital of Celtic songs and legends on April 25th.

NEWS NOTES FROM MILWAUKEE PUBLIC MUSEUM

Collected by Director W. C. McKern (Review Reporter)

The Milwaukee Public Museum will have an expedition in Alaska this fall to collect white Dall sheep for a Museum exhibit, and birds of the area for purposes of scientific record and study. The expedition is being financially sponsored by Messrs. ARTHUR MacARTHUR of Janesville and ROBERT TRACY of Milwaukee, and, in addition to the sponsors, will include the following personnel: Messrs. OWEN J. GROMME, Curator of Birds & Mammals (in charge); WALTER C. PELZER, mammal taxidermist; LESTER J. DIEDRICH, bird taxidermist; and WILLIAM L. SCHULTZ, artist and preparator. In addition to the collecting of specimens, members of the expedition

will record the trip and Alaskan fauna in motion pictures and black-and-white photographs, thus augmenting the Museum's equipment for illustrated lectures, popular publications, and scientific records. The party will leave for Alaska in August, and will remain in the field for about one month. ... MURL DEUSING, Curator of Education and lecturer on nature subjects, has returned from Central America where he spent the months of January and February photographing jungle wildlife at the Barro Colorado Biological Area in the Canal Zone and also native life among the Choco and Cuna Indians of Panama and the San Blas Islands. He also visited the western areas of Panama to photograph in El Valles and Volcan.



NEWS NOTES FROM MARQUETTE UNIVERSITY

Collected by Prof. Scott L. Kittsley (Review Reporter)

Prof. RICHARD J. RUSSELL of the Geography Dept. and dean of the Louisiana State University graduate school presented the Milwaukee Sigma Xi club annual lecture this year. He discussed the "Instability of Sea Level," citing evidence that sea level has been rising for 20,000 years, the recent rise being a result of melting continental ice. ... The only course in Wisconsin which teaches the uses of an electron microscope is being offered for the first time this semester by the Marquette medical school. The course is designed to acquaint graduate students and staff members with the \$25,000 electron microscope and other equipment of the new Bob Quinn Memorial Electron Microscope laboratory. ... Three phases of Marquette's cancer research program were brought before a Milwaukee television audience recently. Dr. IRVIN I. COWAN, assistant clinical professor of radiology, reported results in his concentrated study of cancer of the ovary. Dr. A. F. RIECK, assistant professor of physiology, discussed his study of the process involved in producing a tumor by some agent in epithelial tissue, concentrating on photo recovery. Rev. JOHN O'BRIEN, C.S.V., associate professor of zoology, presented his study on the effect of temperature on the radiosensitivity of skin which is deprived of oxygen during radiation.

Honors and Awards

LEWIS C. FRENCH of the Milwaukee Journal staff received an honorary recognition citation at the recent UW Farm and Home Week banquet ceremony. ... Biographical stories in the state press recently featured Academy members DOUGLAS MAITLAND KNIGHT, President of Lawrence College, and A. W. SCHORGER, UW Professor of Forestry and Wildlife Management. ... WALTER J. KOHLER, Jr. was given the annual "good citizenship" gold medal of the Wisconsin Society of the Sons of the American Revolution. ... President Eisenhower awarded a Young American Medal, authorized by Congress, to the son of CARL STEIGER (William A.) of Oshkosh, for his work in many civic projects. ... In memory of the late FIDELIA VAN ANTWERP the Wisconsin Regional Writers Association has established, in cooperation with the State Historical Society, the Van Antwerp Wisconsin Folklore Collection. ... HELEN C. WHITE recently received an honorary Doctor of Letters degree from Loyola University.

Note on April Meeting at Beloit

Former Vice-president (Letters) ROBERT H. IRRMANN is Chairman of Local Arrangements for the Academy's annual meeting at Beloit College, April 26-27. His address is Box 34, Beloit College, Beloit, Wisconsin.

WISCONSIN ACADEMY COUNCIL MEETING AND REPORT FROM THE SECRETARY

By Francis D. Hole
Secretary-Treasurer

A meeting of the Academy Council on February 2, 1957 was called to order by President Darling at the University Club, in Madison. Council and staff members present were: JOSEPH G. BAIER, RALPH N. BUCKSTAFF, CHARLES G. CURTIS, S. F. DARLING, C. L. FLUKE, F. D. HOLE, OTTO L. KOWALKE, J. A. LARSEN, FREDERICK M. LOGAN, W. C. MCKERN, KATHERINE G. NELSON, LOWELL E. NOLAND, RAYMOND H. REIS, S.J., A. W. SCHORGER, HENRY A. SCHUETTE, WALTER E. SCOTT, and JOHN W. THOMSON.

New members listed on page 48 of the Winter, 1957 issue of the Academy Review were accepted, together with the following members whose applications have been received since then:

Active:

JOSEPH F. BEIL, Marquette, Mich.
HUGH A. DAGA, Madison
Chief Justice E. T. FAIRCHILD,
Madison
DWIGHT D. FORSYTH, Madison
JAMES B. HALE, Madison
HUGH D. INGERSOLL, Madison
EMIL KAMINSKI, Middleton
Rev. ADRIAN J. KOCHASKI, S.J.
Milwaukee

Mrs. EVA JOHN KUHN, Whitehall
PAUL A. LAWRENCE, Bagley
Mrs. FRED C. MARQUARDT,
Hales Corners
Dr. EARL R. OATMAN, Madison
R. H. ROETHLE, Milwaukee
Dr. CARL SCHILDT, Eau Claire
HAROLD E. SMITH, Wauwatosa
HUBER WHEELER, Madison

Items of business discussed and transacted were:

1. The Council accepted with gratitude the following gifts: \$2.00 from FRANCIS ZIRRER; and for the Junior Academy, \$200.00 from the COMMUNITY TRUST of WEST BEND through NORMAN A. SCHOWALTER, a Trustee; \$100.00 from C. M. GOETHE, and \$50.00 from the A. O. SMITH CORPORATION.
2. The Council discussed at considerable length the uncertain state of the financial prospects of the Academy in view of rising printing costs and our expanding program. The Council recommended that steps be taken 1) to increase our legislative appropriation; 2) to encourage gifts from corporations and other interested parties; 3) to look for cheaper methods of printing without sacrificing quality; 4) to encourage Active members to become Sustaining members.
3. Mr. Larsen, Editor of the TRANSACTIONS, reported that Vol. 45 of the TRANSACTIONS is now at the printer. The deadline for manuscripts for Vol. 46 is June, 1957.
4. Mr. Scott distributed a list of articles planned for the Spring, 1957 Academy Review. The Council expressed its appreciation to Mr. and Mrs. Scott for their enthusiastic labors on the Review.
5. Mr. Thomson reported the desire of the Junior Academy Council that all funds for the Junior Academy be accounted for distinct from Senior Academy funds. The Secretary will adopt this procedure. AAAS research support will come to the state in the form of awards to individual high schools as their Junior Academy groups apply and qualify. Mr. Thomson will attend a Conference of Junior Academies, Feb. 15-16 in Chicago, as our delegate.
6. The planning of the Annual Meetings next April including printing or mimeographing of programs, and call for papers and special

events was placed by the Council in the hands of Messrs. Curtis and Irrmann. Mr. Baier pointed out the need for a permanent Committee of Annual Meetings. At the request of the Council, President Darling appointed the following to serve on this committee: JOSEPH G. BAIER, Jr., Chairman, Rev. RAYMOND H. REIS, S.J., JOHN W. THOMSON, and FRANCIS D. HOLE, ex officio.

7. At the request of the Council, President Darling named the following to serve on the Nominating Committee: KATHERINE G. NELSON, Chairman, Rev. RAYMOND H. REIS, S.J., ROBERT J. DICKE, and FRANCIS D. HOLE, ex officio.

8. The Council adjourned about 3:30 p.m. to meet in April at the Annual Meetings.

Financial Note

Since the Council meeting the following gifts were received for the Junior Academy: \$88.00 from C. M. GOETHE; \$50.00 from ALLIS CHALMERS MFG. CO. through K. W. HAAGENSEN, Pub.Rel.Director; \$25.00 from WISCONSIN TELEPHONE CO., Milwaukee through M. L. DAY, Pub. Rel. The Senior Academy received \$20.00 from DUNCAN J. STEWART of the Barber-Colman Co., Rockford, Illinois.

On February 21, 1957, Professor A. W. SCHORGER, of the Academy Council, and Secretary-Treasurer FRANCIS D. HOLE appeared at the Joint Finance Committee of the Legislature, to explain why the Academy needs the \$6,000 appropriation requested for the next biennium. The Governor had recommended an appropriation of \$3,750. Mr. Schorger explained that the Academy TRANSACTIONS are exchanged with 568 institutions at home and abroad for publications valued at about \$6,000 per biennium. The Academy also publishes papers concerning the physical and cultural resources of the state, and stimulates young people to develop their talents. It is hoped that adequate funds will be forthcoming, in view of the rising printing costs, and the need to maintain a high quality publication, the TRANSACTIONS, for exchange purposes. Exchange items are available for public use at the University Memorial Library.

New Members

Applications for membership since the Council meeting are:

Active:

TRUMAN G. BLOSS, Madison
 RICHARD J. COSTLEY, Milwaukee
 RAPHAEL C. HAWLEY, Milwaukee
 DONALD W. HILL, Madison
 Rev. ROBERT E. HOENE, S.J.,
 Milwaukee
 CYRIL KABAT, Madison
 ARTHUR LENSINK, Oostburg

Mrs. GORDON MacQUARRIE, Milw.
 Mrs. STAR POWERS, Milwaukee
 Mrs. EDWARD PRUSSAK, Chicago
 HOWARD E. SNOW, Spooner

Family:

JAMES A. CLARK, Larsen
 ANNELLE CLARK, Larsen
 OLIVER C. SANDERS, Janesville
 EDITH M. SANDERS, Janesville

LIBRARIES which subscribe to publications of the Academy instead of receiving them on an exchange basis will now receive the Academy Review as well. They are: Akademii Nauk SSSR, Moscow; Univ. of British Columbia, Vancouver; Dept. of Public Printing & Stationery, Ottawa, Canada; Centre de Documentation, Paris; Detroit Public Library, Michigan; Duke Univ., Durham, N.C.; Water Pollution Research Lab., England; Lehigh Univ., Bethlehem, Pa.; Librairie Encyclopedique, Brussels; Univ. of Maine, Orono; Michigan State College, East Lansing; Milwaukee Public Library; N.D. Agricultural College, Fargo; North Texas State College, Denton; Univ. of Pittsburgh, Pa.; Southern Methodist Univ., Dallas; Southern Illinois Univ., Carbondale; Utah State Agricultural College, Logan; Washington State College, Pullman; Alexander Horn, Bookseller, Germany.

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EDITOR, WISCONSIN ACADEMY REVIEW

Walter E. Scott, Madison

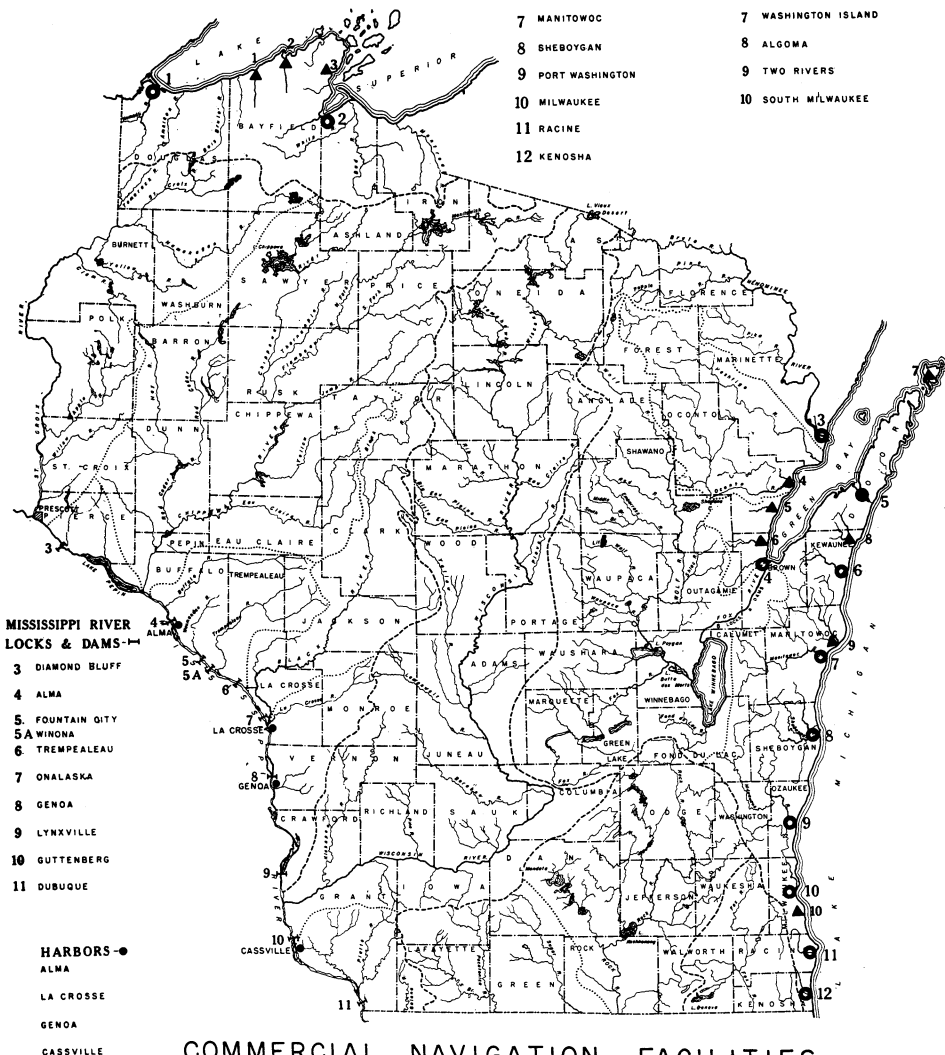
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- 5 PENSAAUKEE
- 6 SUAMICO
- 7 WASHINGTON ISLAND
- 8 ALGOMA
- 9 TWO RIVERS
- 10 SOUTH MILWAUKEE



COMMERCIAL NAVIGATION FACILITIES

This is map No. 3-II opposite page 50 in "The Natural Resources of Wisconsin" prepared by the Natural Resources Committee of State Agencies (Dec. 1956) and available from the Bureau of Purchases, State Capitol, Madison, 1, Wis. for 75¢ per copy.