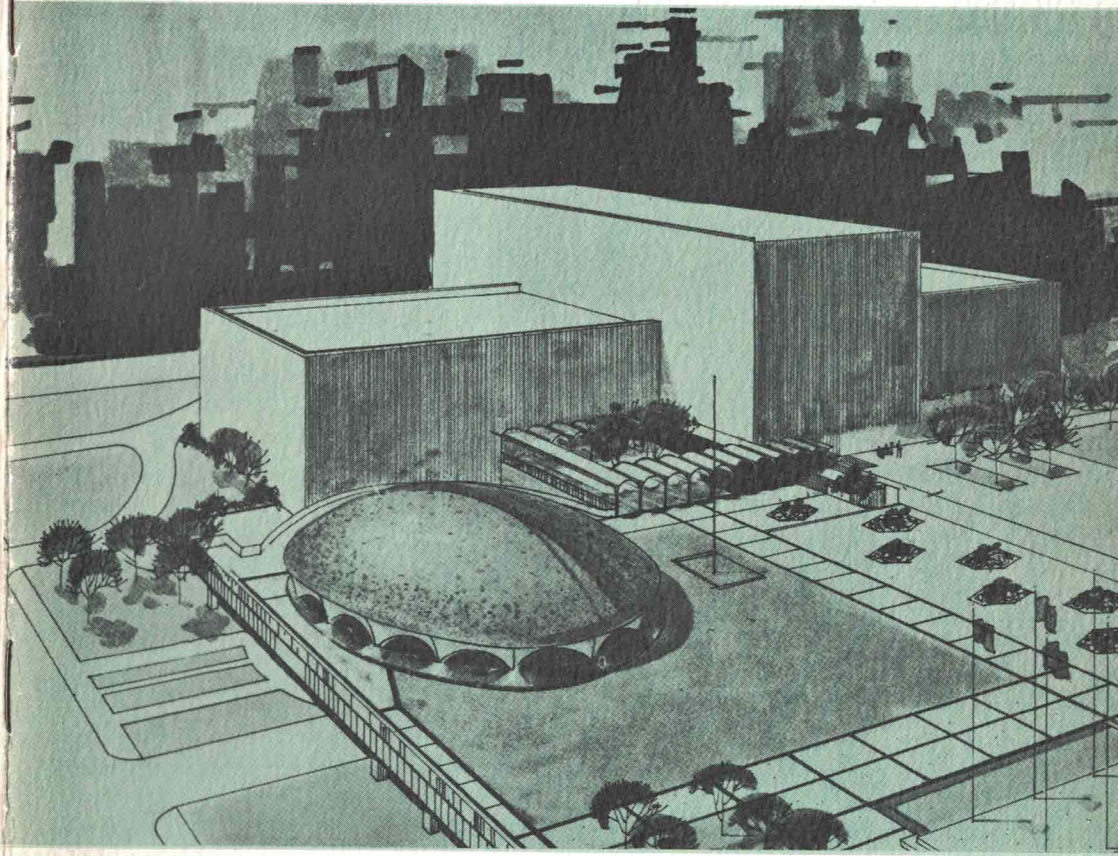


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# LORE



SPRING, 1968

# LORE

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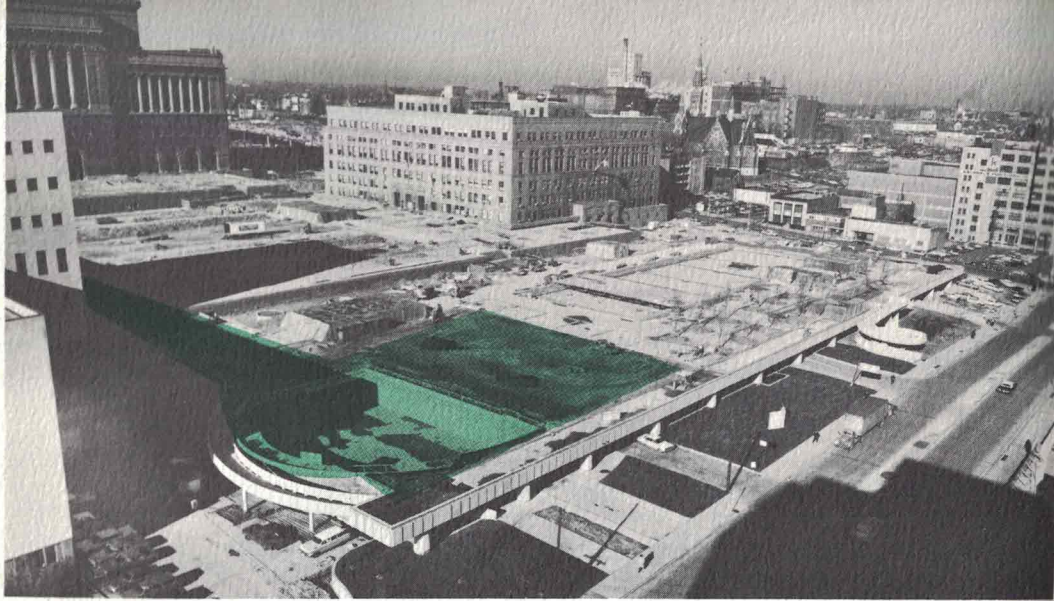
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MacArthur Square, looking northwest  
Space Center, lower left



## THE WISCONSIN REGIONAL SPACE CENTER

by **BARBARA E. KOCJAN**

*Miss Kocjan, a former student aide in the Museum's Reference Library, was associated with every aspect of the planning of the Space Center's development as a stenographic coordinator of the projects prepared for the Space Center in action.*

With the advent of the Space Age, when the first Russian Sputnik was hurled into orbit on October 4, 1957, world-wide economic, scientific and educational planning have been revolutionized. Because satellites and space flights have affected the lives of all Americans, not only scientists and students, but also the average man, it is necessary that the general public understand current space-related activities. A new type of educational facility is needed—a space age science education and research center which would instruct the public, motivate the student and carry on sophisticated scientific research. The Wisconsin Regional Space Center will be such a facility. Connected both professionally and architecturally with the Milwaukee Public Museum, the Space Center will complement the

Museum, the latter looking back at man's ecological history on earth up to the present, the former exploring his future in space. At the Space Center, traditional subjects such as biology, chemistry, mathematics and astronomy will be given modern interpretation as they are combined with history, classical mythology and humanities in order to present a richer and more complete picture of man's environment than traditional planetariums could possibly do. These exciting new approaches will involve oceanography, geology, and the study of the moon and planets, explored from a "new vantage point—Space." That is, instead of looking at space only from the viewpoint of the earth, the facilities of the Center will allow the universe to be seen from any point in our solar system as far out as Saturn. Therefore, the observer can see the earth and its time related position in space as an astronaut would view it. The entire concept of the new space vantage point thus gives a radically different perspective to the study of the earth and its surroundings.

To properly use the Space Center at its fullest potential, the visitor should have a background of the traditional concepts which can be gained first from visits to the more earth-oriented planetariums located throughout the seven-state region. Workshop programs have already been held with planetarium directors in the region, so that they can work together with the Center. Although the Wisconsin Regional Space Center will be flexible enough to give the visitor this background, the main purpose of the Center is to give special and intensive instruction that could not be obtained elsewhere. Education would thus be an important part of the Center. An initial curriculum program for elementary and secondary schools through the university and professional level has already been planned in addition to public events in the form of workshops.

In 1966, it appeared as though the Federal Government (through the Office of Education) might pay the extra cost of construction, equipment, program development and operating expense up to the completion of the project. This hope was not realized because of numerous policy changes and national budgetary cut-backs made necessary by military commitments and civil disturbances. However, a planning grant for \$74,000 was given to the Milwaukee Board of School Directors during 1967 for use in planning the educational program. When the Center is in operation, other federally funded assistance may be available to explore new teaching programs.

Robert A. Thompson, the Director of the new Space Center, has a background ideally suited to its purposes. He received a degree in electrical engineering from Case Institute of Technology in 1958. On graduation, he became involved in the design and operation of the SOHIO Satellite Tracking Station (which was then in its original stages) and served as its director for the last two years of its existence. He served as director of the Warrensville (Ohio) Planetarium and Space Science Program. He was also employed by the Cleveland Board of Education during this time in the fields mathematics and physical sciences. He served as chairman of the Cleveland Public School's Secondary Mathematics Curriculum Committee and, during the 1965-66 school year, as the planning phase director of the Cleveland Supplementary Education Center Science Division.



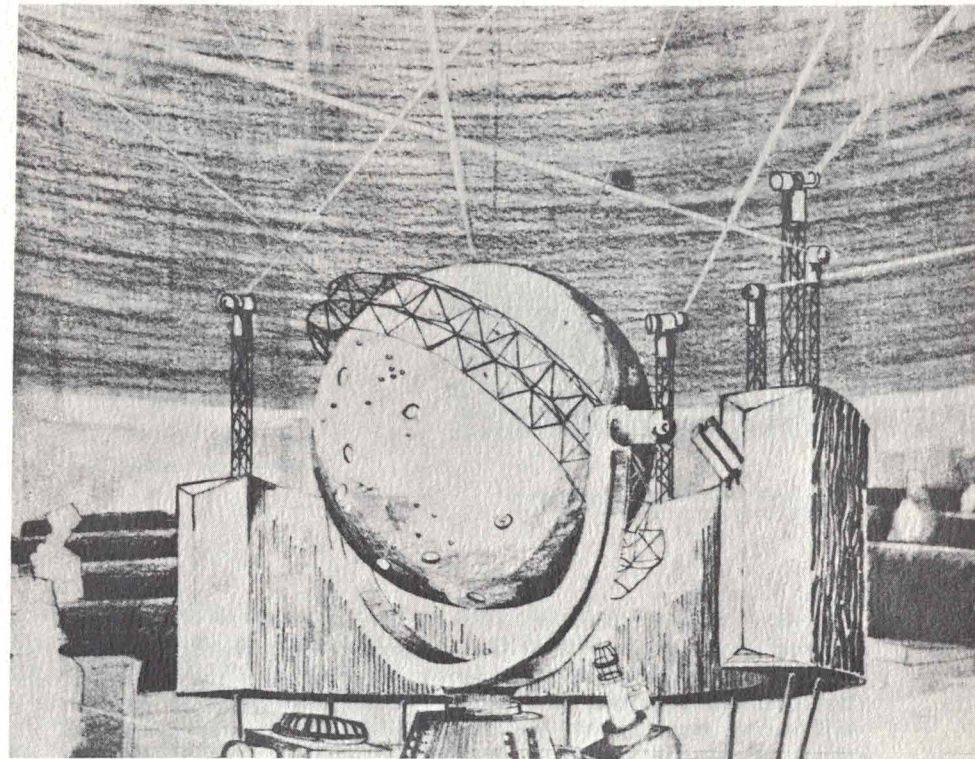
Mr. Thompson is the author of numerous scientific and educational publications and is a member of many professional societies. He immediately took charge of the Space Center including both its scientific and public relations aspects. Mr. Thompson was assisted by interpretive specialist M. Theodore Branchik who, by presenting new material to over 10,000 students, provided the major experimental link between Milwaukee School planetariums and the Space Center. Neal D. Eigenfeld supervised curriculum development which would tie in the existing curriculum of the school system to future Space Center concepts.

Architectural design of the Wisconsin Regional Space Center is in the hands of Donald L. Grieb and Associates. The Center will take the form of a floating ellipsoidal dome. The main entrance on Seventh Street will lead to a lobby where information can be obtained and sales items will be located. Escalators will take the visitor up to the Spherical Projection Chamber, which is the focal point of the Center. The domed chamber will be round, soundproof, and have a dome approximately 70 feet in diameter which will extend down to and below the floor. The viewer will thus be placed in the center of the presentation and will have the sensation of being surrounded by the oceans, mountains, clouds or the starry background of space. This area will seat about 500 people. Unique features of the chamber are:

**The Space Transit Simulator.** Traditional planetariums allow the receiver to see the universe only as we see it from any point on the earth. The Space Transit Simulator would make it possible to assume travel through the Universe, and thus view it from any point in the solar system which is visible from Earth—from the moon, Jupiter, Mars, as far out as Saturn. Since the Space Transit Simulator can simulate a space flight between the earth and the moon or any of the visible planets in space, hook-up with the National Aeronautics Space Administration monitoring facilities is being explored for the 1970 Apollo moon flight, so that the participant can, by means of projected closed circuit television relay, experience the same sights and sensations of pitching and rolling as the astronauts, in addition to following the simulated "flight" in the chamber.

**Demonstration Platform.** The domed chamber will also contain a demonstration platform which will make lectures clearer and add information to them. The lecturer will be able to perform experiments while being watched by a closed-circuit color television camera, so that everyone in the chamber can "look over the shoulder" of the experimenter through the eye of the television camera which projects its view onto the dome. Tapes of the experiment could be stored for future use.

**Panoramic Radial Projector.** The projection of film taken from sea bottom vessels, earth-based cameras and airborne units can produce special effects. To cite only one example, the chamber could be transformed into a ship which is lost at sea. The participants would try to find their location by means of clues: visual aids in addition to the star background projected on the dome, sound equipment to reproduce the sounds of the sea, and air jets to simulate wind of proper odor, temperature and direction of air and water currents. The participant would be given hints as to what these clues mean. For example, the sighting of a certain species of birds, certain stars, the measurement of the temperature and color of the water and

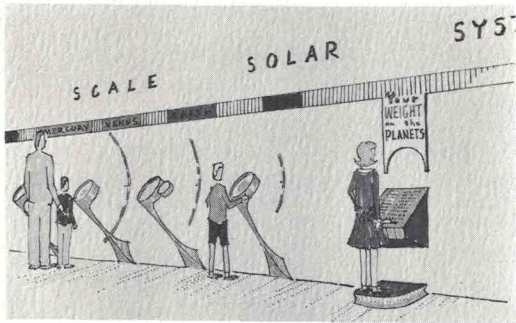


Space Transit Simulator

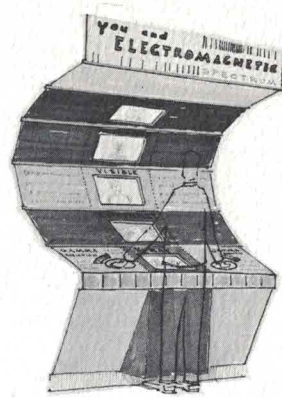
proper identification of an odor would all indicate a certain location, but the participant must identify the clues correctly, put them all together and use his reason to determine the correct location.

In delivering a lecture, the speaker would be able to walk freely through the chamber, using a microphone. A lecturer would use many materials, including multiple slide projection and three-dimensional wide angle movie projection. Remote television would relay demonstrations from other parts of the building when it would be too dangerous or awkward to bring them to the chamber's platform. Television would also be used to video-tape actual astronomical happenings. It also would be possible to find how much of the material the students have understood by means of a button unit, similar to the push button telephone, to be located at each seat. The student would push it when requested to indicate comprehension of the material presented. This would have the advantage of obtaining a truthful response, as only the individual would know his own answer. Electronic tabulation would give the lecturer an idea of the degree of understanding of his material, so that he could immediately expand points which were not clear and improve future lectures where necessary.

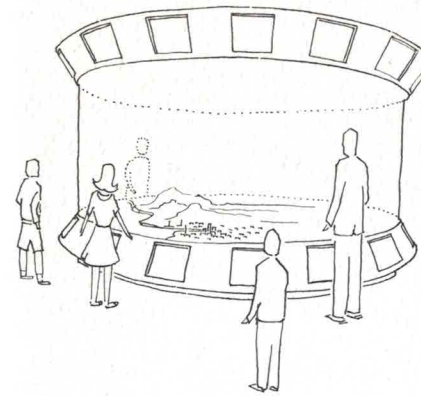




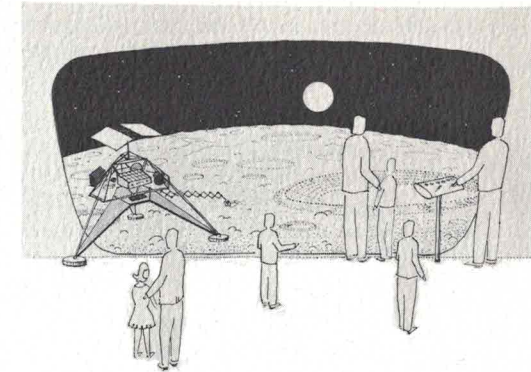
Scaled Solar System (portion) Unit



Electromagnetic (portion) Unit



Hydrologic Cycle and Pollution Unit



Lunar Probe Remote Sensing Unit

Possibly the most exciting and original area in the Space Center will be the **Demonstration-Participation** units, which are under the engineering supervision of Fred C. Cousino. The Demonstration-Participation Units will involve the visitor in an active educational experience using all five senses. The participant will use the information which he has acquired from the Units to make decisions. Although the casual observer will not benefit as much as the visitor who actually used the unique Space Center facilities, he should be able to learn as much as he would from any top quality display.

Demonstration-Participation units, (called "Dem-Par" Units by the staff) will be divided into three main areas. **Space—The New Vantage Point** section will give the visitor a different perspective on the earth and surrounding planets and new insights into oceanography, navigation, and geology and meteorology, incorporating technology developed in response to space-age needs of our society. An example of such a unit would be a device in which conditions within a space ship were simulated. In another unit, participants would try to rendezvous and dock their ship with another, maneuvering the "spacecraft" by means of controls which would produce motion going up, down, sideways or around an axis, technically called pitch, yaw and roll.

Other Demonstration-Participation ideas would incorporate an originally designed, scaled solar system, giving size, distance and motion in proper perspective; experiencing of weight and strength as they would be on other planets; sensing materials comparing the surfaces of different planets and monitoring of Milwaukee's air, water and their pollution, as well as live monitoring of satellite orbital photography.

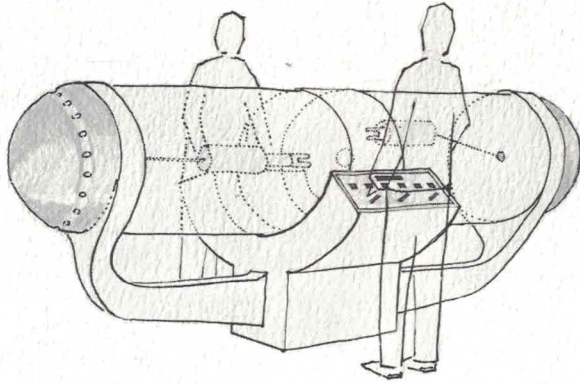
The **Biological-Environmental** section would be a second major area. It will deal with the problems which man faces when he leaves *terra firma* to explore the oceans and outer space, besides medically monitoring the

human body and its diseases here on earth. Since the human body has such a small range of adaption, man must take his environmental shell with him wherever he goes. When he ventures to live on the moon, he must contend with the hostile environment; the extreme temperatures, radiation hazards and lack of atmosphere, food and water. A Demonstration-Participation unit will show the present technological adaptations to this strange environment, such as harnessing solar energy to power devices which produce water, oxygen, nitrogen and food. The visitor to the unit would be able to see the environmental chamber in operation, walk in a lunar garden, feel temperature changes, and experience the (compressed) two weeks of alternating sunlight and darkness which comprise a lunar day.

A third Demonstration-Participation area will explore the topics of matter, and energy, including the electromagnetic spectrum. Classification, use and conversion of energy, production and detection of light involving the nature and perception of color, x-rays, gamma rays, ultra-violet, infra-red radio and microwaves, will all be included. A unit illustrating the ten common forms of energy and showing how each can be converted into one or more of the other forms is conceived. "Visitors will be checked out on their operation of the Dem-Par Units, similar to pilots of aircraft," said Thompson. "This gives visitors a sense of accomplishment and allows them to instruct others they bring to the Center in turn."

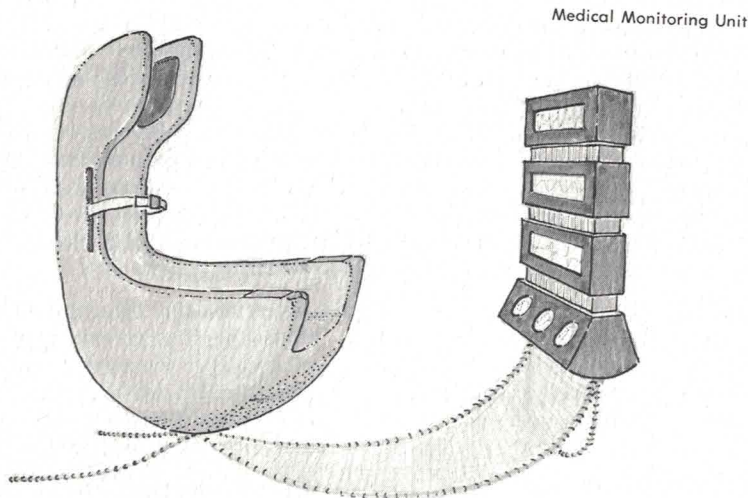
In addition to the Demonstration-Participation areas, laboratories will be available for use by both members of the staff and talented high school and college students for research in biology, chemistry, physics, astronomy and mathematics. A library and multi-purpose assembly area are also planned. The assembly room could be used for short term traveling exhibits, group meetings, eating facilities and short term workshops. The room will have movable partitions and storage in the wall area similar to proposed lunar living areas. Because education is such an important function of the Space Center, several workshops are being





Rendezvous Simulation Unit

planned under the direction of Bolling B. Smith. These workshops will reinforce and supplement classroom learning. Among workshops for elementary and secondary students would be one especially designed for children from disadvantaged areas. They would participate in field trips and laboratory activities which would hopefully increase both their scientific interest and pride in themselves. Workshops for Milwaukee area students would explore geology, biology, hydrology, physics, mathematics, astronomy and related humanitarian subjects in more detail. Some workshops would study topics such as lens grinding, telescope making and electronic apparatus assembly and rocket design. The staff would not only guide, but also challenge the students. The unique facilities of the Center would be a valuable supplement to classroom study of these subjects. Workshops would also assist in retraining teachers in the newer concepts of the space age. The teachers would receive in-service credit



Medical Monitoring Unit

for attending these workshops. Students would be given certificates of accomplishment, since certain workshops would be prerequisites to others that are more advanced.

At present, the workshops are being brought into the school classroom. When the Center is operational, classes will be able to come either for a single visit (with optional follow-up visits) or for the after school workshops. Elementary and secondary level workshops would be held after school hours and on Saturdays, and teacher workshops would take place after the school day. Sundays would be available for special projects, field trips or research.

Because the Space Center will serve such a large region, an effort was made to develop an "outpost" or extension in the form of a Science Camp for especially talented students. Since the Center did not desire to go into the camping business, it was necessary to locate it in an already existing camp structure. The desired atmosphere was one of creativity and freedom which could be channeled into disciplined study and research effort. The program would need to attract talented students throughout the region and would be open to all, regardless of social and economic background. Eligibility would probably be determined by the Scholastic Aptitude Testing Program in science, an interview or both. The student would work on a project with guidance provided by specially selected instructors. Hopefully the ratio of instructors to students would be one to six. The Hull House Association of Chicago has received this idea enthusiastically. The Association operates the Bowen Country Club Hull House Camp in East Troy, Wisconsin. This camping facility emphasizes creative art, music, drama and writing. Four hundred acres of wooded areas and a large lake offer an excellent natural laboratory for geological, geographical and biological study, as well as a stimulating setting for astronomy and other scientific research. Athletics and an opportunity to meet others talented in different disciplines would also be part of the program. The Hull House Board of Trustees and the University of Wisconsin-Milwaukee have committed themselves to cooperation with the Space Center on this project. It is hoped that a program of this type could soon be made available on weekends throughout the year, as well as during the summer, for adults as well as young people.

All these concepts—the Domed Chamber, the unique Demonstration—Participation areas, the workshops and science camp—offer exciting possibilities. In the words of Dr. William M. Lamers, Assistant Superintendent of the Milwaukee Board of School Directors and President of the Milwaukee Public Museum Board of Trustees:

The Wisconsin Regional Space Center promises to be unique, not only for the fact that it is the first facility of its kind in the world to bring together space age discoveries, but also to interpret the space age to the general public and to the student and scientist as well. The project, its physical make-up, staff and curriculum will provide the whole Middle West with a highly effective teaching laboratory that can readily be tied into the on going programs of tens of thousands of elementary and secondary schools and hundreds of colleges and universities. It would attract world-wide attention to the city, state and nation.



MAXIMUM PRESSURES IN DEEPEST PART OF BASIN, OIL, GAS AND WATER—EXPRESSED FROM SOURCE SHALES INTO RESERVOIR SANDS—MIGRATE TOWARD AREA OF ZERO PRESSURE AT EDGES OF THE BASIN

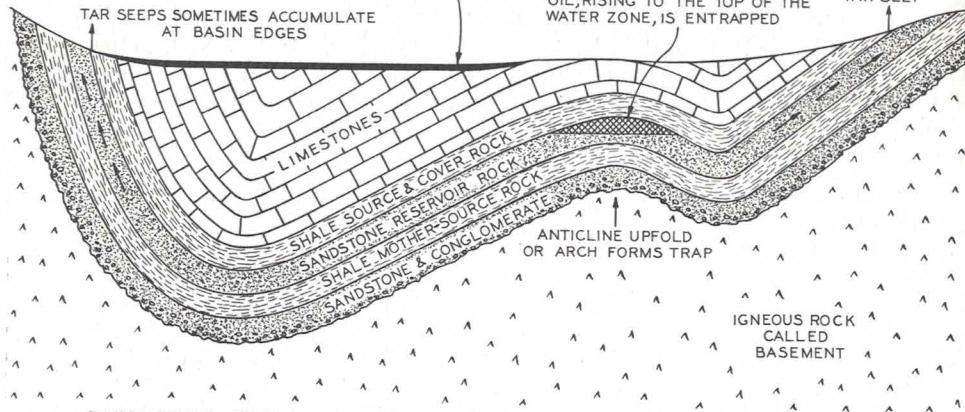
BEDROCKS ARE EXPOSED AND CAN BE STUDIED IN THE RIM OF THE BASIN IN THE UPLANDS

BEDROCKS ARE COVERED BY ALLUVIUM IN THE CENTER OF THE BASIN

AS THE OIL AND WATER MIGRATE THROUGH THE ANTICLINE, THE OIL, RISING TO THE TOP OF THE WATER ZONE, IS ENTRAPPED

TAR SEEP

TAR SEEPS SOMETIMES ACCUMULATE AT BASIN EDGES



DIAGRAMMATIC CROSS SECTION OF HYPOTHETICAL BASIN SHOWING THICK SEDIMENTARY MARINE FORMATIONS TAR SEEPS AND AN OILFIELD ENTRAPPED IN AN ANTICLINE

## EXPLORING FOR OIL PETROLEUM FIELD GEOLOGY IN EGYPT, KANSAS AND VENEZUELA

by **GEORGE J. GAENSLEN**, Asst. Curator of Geology

Mr. Gaenslen is a graduate of West Division High School and the University of Wisconsin where he majored in geology. He spent thirty years in the petroleum industry, 1937–1966, where his assignments included field laborer, field surface-mapping, and concessions appraisal and evaluation. He worked in Gulf Coastal Louisiana and Texas, West Texas, Egypt, Kansas, Venezuela, and Southern France. In late 1966 he returned to Milwaukee and has joined the Museum staff as an Assistant Curator of Geology.

Before describing the life and work of a field geologist, it might be of interest to know what principal geologic features are necessary for the accumulation of petroleum in nature.

Crude oil is found primarily in sedimentary rocks which were laid at the bottom of the sea. Ancient seas at different times have transgressed over most parts of existing continents and deposited thousands of feet of marine sedimentary rocks, such as sandstone, shale, and limestone. Such ancient epicontinental seas might be compared with the Black, Caspian, Baltic, and North Seas, or Hudson Bay. The sites of accumulated sediments are called "basins." The first requisite to find oil, then, is to find a basin with thick sedimentary strata. Basins range in size from small, like the Los Angeles basin which is 63 square miles, to large, like the Alberta basin in western Canada which is 340,000 square miles. More typical is the Illinois basin, 58,000 square miles, and Maracaibo basin in Venezuela, 20,000 square miles. For comparison of the size of these basins, Wisconsin has an area of 56,000 square miles.

The thickness of sedimentary strata in basins often totals 10,000 to 20,000 feet or more. They usually consist of sandstones, shales, limestones, and sometimes thick sequences of strata left by evaporation, including salt, gypsum, and anhydrite.

Once a basin is found, four important factors will control the entrapment of crude oil or natural gas in commercial quantities. First, thick formations of mother-source rocks must be present in which were buried the remains of large masses of sea life. Such source rocks are typically grey or dark-colored shales or lime-muds. It is believed that fats and oils from entombed sea life are expressed out of the shales and lime-muds by pressures built up as overlying sediments accumulate.

Second, porous and permeable sandstone or limestone must be present into which the expressed fats and oils can escape and be reservoired. Sandstone reservoir formations usually have a porosity of from 10 to 20 percent. It is this 10 to 20 percent of the sandstone or limestone into which the oil is expressed from the shale or lime-muds.

Third, the reservoir formation must be deformed or obstructed in some manner to entrap the oil and gas. One such deformation may be an upfold or arch called an "anticline."

Fourth, the reservoir rock must be covered with an impermeable roof rock so that the oil and gas will not escape upward into the overlying formations.

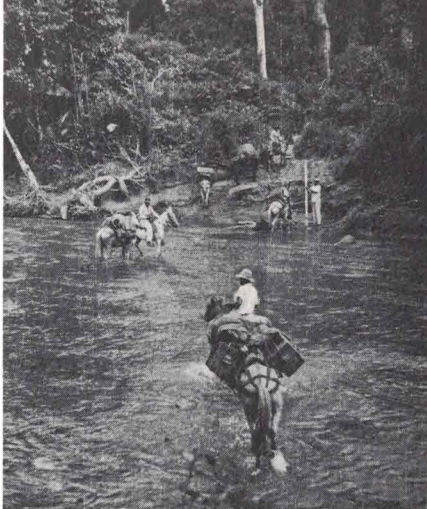
The cross section of a hypothetical basin accompanying this text illustrates the principal factors necessary for the accumulation of oil and gas.

In a well-ordered exploratory program, the first task is to find favorable basins in which to work. This search is begun by studying the geologic maps of the region in which one expects to search. Basins are selected which appear to have thick formations of grey or dark-colored shales with interbedded sandstones or porous limestones. Evidence is also sought on the maps which might indicate the existence of possible traps, such as those which are created by the folding or faulting of the strata.

Field geologists are sent into selected basins. They have several tasks. First, they must measure the thicknesses of the formation in the basins and describe the formations. The thicknesses and qualities of the forma-



Geological field party fording Rio Misoa, Maracaibo Basin, Venezuela. Such parties may include up to thirty mules.

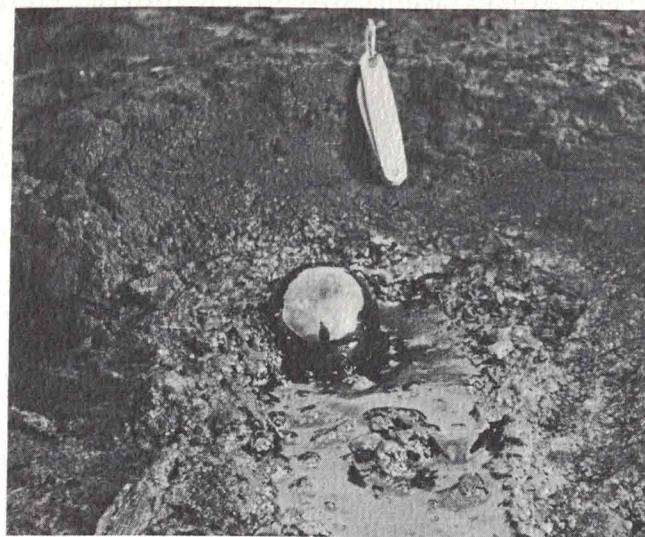


tion change, so that they must be measured and described at many localities. A good geologist soon develops a sense for finding the direction in which thicknesses and qualities tend to improve. Since vegetation and soil usually cover up the rock strata over large areas, river valleys are explored with particular care. In the river bottoms the soil and gravel tend to be swept away, so that in humid areas the river bottoms are the best places for oil geologists to work. Typically a basin will consist of a rim of uplands or mountains, and a center of flat alluvium. Rock strata are exposed in the uplands along the rivers which run down the mountain sides. The geologist measures and describes the strata along each of these rivers, a technique which is called "measuring sections." The thickness at each river can be plotted on a map for office study. Thicknesses measured in the upland-rim of the basin, where the bedrocks are exposed along the rivers, can be extrapolated into the alluvium-covered center of the basin where no bedrock is exposed.

Other maps are made to show the areas of favorable factors of each formation. The prospective areas, then, are those in which occur a coincidence of favorable thicknesses and favorable rock qualities, such as adequate mother-source rocks, adequate porous-reservoir rocks, adequate cover-rocks, and adequate trap-forming structural deformation.

My first field assignment was in Sinai and the Western Desert of Egypt. The strata there are almost flat lying and the objective of the mapping was to find the slight local structural deformations which might indicate a trap in the strata below. The outcrops in the desert are excellent and travel was relatively easy. We could use aerial photos to excellent advantage and were able to map several anticlines. However, the most favorable province for oil proved to be in the Gulf of Suez where outcrops are limited and where seismograph is better than field geology for finding structural traps. Whatever oil the company found was credited more to seismograph than to surface geology.

The vastness of the desert lent charm to our field life. The desert is very clean and the air crystal pure. From time to time we would find lonely Roman or Greek ruins, and occasionally would even find a few ancient coins in the sand.



Gas bubble in oil seep, Mene Grande Oilfield, Maracaibo Basin, Venezuela.

The desert afforded, of course, no resources whatsoever in the way of food or drink. We had to carry several week's supplies and soon ran out of fresh food. We lived on rice and lentils, and strangely enough, ducks which survived longer in the desert than chickens. Canned food was not available.

One Christmas Day in the desert, my Egyptian companion, a Moslem, surprised me with a big Christmas cake which he had the thoughtfulness to buy in Cairo weeks before. The cook has been hiding it in our food supplies for five weeks for the big occasion.

My next assignment was in Kansas where a boom was under way. Oil had just previously been discovered by means of surface-geology-mapping and the race was on. The type of work was similar to that in Egypt—to map slight structural deformations in the strata exposed at the surface, which might indicate a structural trap in the strata below. The goal was to map in detail one square mile a day. This included much survey work. Consequently we would often work far into the night calculating surveying notes so as to be ready to start off again the next morning. The pressure was considerable, for not infrequently competing geologists would simultaneously work the same pastures and fields.

The two years in Kansas were the ones which allowed the most family life for the field geologist. I could usually be home at night, and on Saturdays I would take my son on field trips or watch him ride the tractor or the horse on the farm where we lived. Oddly, rattlesnakes in Montana (where I did a few short jobs) and the farm dogs in Kansas offered worse hazards than any snakes or wild animals in the jungles of Venezuela. The Kansas community where I worked was rural America at its best. It was probably the high point in my son's childhood.

In Venezuela oil has been known for centuries. Seepages of tar and asphalt were called "menes" by the Indians who used the tar to calk their boats, as did the Spaniards after the conquest. Many of the richest oil-fields of the world have been discovered through prospect drilling in areas



Geologist reading amount of dip of strata. The instrument is a Brunton Compass.



where seeps indicated that oil or gas existed underground, and Venezuela is an example. When I arrived in 1950 the positions and sizes of the principal basins, and the locations of numerous traps in these basins, had long been known and adequately mapped. Still undone, however, was the task of measuring the thicknesses and describing the qualities of the sedimentary rocks in relatively unexplored portions of the basins. It was necessary to know where the qualities of the rocks were most favorable for oil and where the favorable rocks were the thickest. Such studies, which are concerned primarily with the sequence of formations and what they consist of are called stratigraphic studies. These stratigraphic objectives in Venezuela contrasted with the objectives in Egypt and Kansas where we had been looking for structural deformation in the rocks, which would indicate traps.

My assignment was on the southeast border of the Maracaibo basin in the Venezuelan Merida Andes Mountains. It was part of a major basin-wide program by my company, Standard Oil of New Jersey, to refine our interpretations in the Maracaibo basin and thereby to find new oil. The program included two other geological field parties and two seismograph geophysical parties.

Numerous deep wells had been drilled by 1950 in the alluvium covered portion of the basin and in Lake Maracaibo. The thicknesses and qualities of the formations penetrated in these wells had been carefully mapped, but the relations and correlations of the formations in the wells with the formations exposed in the upland rims of the basin were not well understood. Development of known crude oil deposits had reached a point where it had become necessary to correlate correctly the subsurface formations in the wells with the surface or "outcrop" formations in the upland areas.

Inasmuch as the mountainsides as well as the bottom lands are covered with rain forests and jungles, the river beds were the best places to find the bedrock exposed beneath the thick vegetation. My first task was to wade up one mountain stream after another, measuring and describing the succession of sedimentary strata exposed in each.



Geologist planning his day's work with aerial photos and stereoscope.

The party consisted of myself, two assistant geologists, a cook, a mechanic to keep our vehicles rolling, three laborers, thirty fine mules, two jeeps, and a three-ton truck. Our program was to work in the field eight weeks, followed by one week in Caracas for supplies and office work. All families resided in Caracas. Travel between the field and Caracas was largely by plane and jeep.

If our field work was near a town we would rent a house as our office-living quarters. Rather complete drafting facilities were necessary in order to keep our maps current with all the new data we were gathering. Each geologist would spend perhaps one day a week in the field office on the maps.

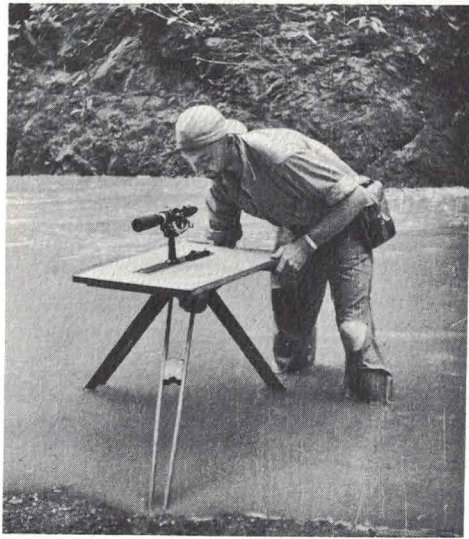
If the work was farther than thirty miles from the closest town but near a road, we would put up a camp of seven tents, five for living quarters, one for office-mess-kitchen, and one for mule gear. If the roads were not available, but if we were in an area of mule trails, we would transport our gear on the thirty mules. About 20 percent of our time was spent in rivers along which neither roads nor mule trails existed. In these areas we had to back-pack our supplies. Such trips were necessarily of limited duration, perhaps three days, and usually included our worst "forced marches." Such forced marches were necessary to cover as much ground as possible with the limited supplies.

Perhaps our most direct participation in finding a new oil field occurred, strangely enough, in an area of no outcrops in the alluvium-covered central portion of the basin. We found new seepages in an area where none had ever been reported before, in the vicinity of an old abandoned unsuccessful well or dry hole. Geophysical maps indicated in the subsurface formations structural anticlinal deformation suitable for the trapping of oil. We interpreted that the seepages were oil which had accumulated at the old abandoned well and had seeped up to the surface along the well bore and along neighboring fissures.

On the strength of these new seeps we would be able to strongly recommend drilling on the anticline which had been indicated on the geophysical maps, if we could demonstrate that porous potential reservoir



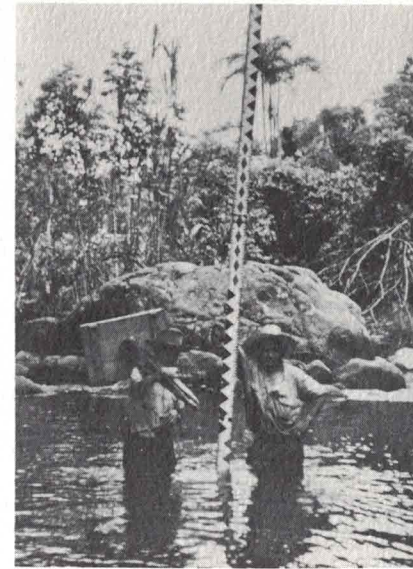
Setting up the alidade preparatory to surveying rockoutcrops along the river bed.



beds existed in the subsurface. We had already mapped such favorable porous beds in the mountain rim-rock of the basin, fifteen miles removed from the prospective area and the seeps. The problem was to trace these porous beds to the prospective anticline in the alluvium-covered central portion of the basin. This could be done in part by studying the subsurface formations as revealed by well cuttings from exploratory wells between the rim-rock and the prospective area. However, such correlations can be made with more certainty if careful geophysical seismograph work has been done and if good seismograph records have been obtained from the work. In this particular case we, the surface geologists, the geophysicist seismologists, and the subsurface geologists who had studied the subsurface formations by means of the well cuttings were all three able to collaborate and correctly correlate the potential reservoir beds exposed in the mountains with subsurface strata indicated in the geophysical seismograph record. The assurance that these important potentially productive horizons existed in the subsurface basin-center justified further exploratory expenditures which led ultimately to a new important discovery.

It was in my river work that I had an unusual opportunity to know the countryside and the people of Venezuela. This was a privileged experience because at that time most of the areas in which I worked were inaccessible except by mule-train, and not infrequently only on foot, by carrying one's bedding and food on one's own back. Thus the country folk were interested in meeting our little party and accorded us the friendliest greetings. Later on, as roads and easy transportation were introduced, the empathy in our contacts was mutually reduced.

The types of people as well as the vegetation tend to vary with the different elevations. Above the tree line the settlements are sparse, and fog and snow often cover the summits. Below the tree line in the wheat and vegetable fields of the high mountains, the Andino mountaineer, clad in his poncho, is a striking figure. He represents the Indian Spanish



The alidade is used to ascertain the position and elevation of the rod. In this instance the rod is placed merely to fix on the map a curve in the river. More typically the rod is placed on a bed of rock in order to fix its position.

mixture. In the lush banana and coco plantations of the coastal plains, Negro types and customs are more evident, together with immigrant types from Spain, Portugal, and Italy. The oil fields along Lake Maracaibo are little cosmopolitan communities with a high percentage of North Americans.

The lack of roads in many areas, until very recently, led to the preservation of a rustic simple life with an indigenous charm. The Andinos maintained an Old World self-restraint and courtesy. Their diversions were homely, often with strong reference to their Catholic faith. Of typical charm, and some pathos, is the "kidnapping" of Jesus in the high Merida Andes during the evenings of the Christmas season. The air is chill and damp, perhaps 40° F. The people are not warmly dressed. The houses are a quarter of mile apart and the dark foot paths between them are all up and down hill. The Christ Child, in the form of an elaborately dressed doll, is "visiting" in one of the thatch-roofed, one-room, mud houses that dot the mountainside. All the neighbors within two or three miles, each carrying a flashlight, form a procession to the house where Jesus is being entertained. After the prescribed social exchanges and formalities have been observed, a "tussle" ensues and Jesus is "kidnapped." The flashlight procession wends its way over the winding mountain path to a new home, where Jesus will be entertained until the next evening when he will be kidnapped once again. The apparent gaiety of the Andinos seems, to a Caracas visitor like myself, in brave contrast to the rather bleak mountainside.

Field geology is of absorbing interest because of the opportunity it affords to know the countryside intimately, both domestic and foreign. The geologist is fortunate to meet and work with such varied types as the Andino mountaineer, the desert Bedouin who offered me water to drink, the Moslem companion geologist who read me the Koran under our tent, and the hard-working friendly American Kansas farmer, still close to the earth and the basic values of life.



# A PLACE CALLED MILWAUKEE

by ELDON G. WOLFF, Curator of History

Mr. Wolff has a manuscript in preparation on "Milwaukee Before the Survey, 1835." Some very interesting facts about the naming of the city and about the tribes which were associated with the area have been turned up in the course of his research. The editors of LORE feel that our readers will enjoy following Mr. Wolff in his exploration of our region's early history.

Should it be spelled Milwaukee or Milwaukie? This appears to have been a burning question just before the city received its charter. A. C. Wheeler, in his *Chronicles of Milwaukee*, called the many debates another case of tweedle-dum and tweedle-dee. If one goes far enough back into the record it becomes questionable whether the city should have been named Milwaukee at all. The original name referred to the river, not to the land. The story, however, is somewhat involved.

James S. Buck settled the matter of Milwaukee to his satisfaction by saying, ". . . as its Indian name implies, THE BEAUTIFUL LAND." In this and several other instances, one begins to suspect that salesmanship and local advertising took a hand. Buck was totally unaware that the name, regardless of its spelling, referred to a river—and not always the same stream. There is some confusion as to which river bore the name originally, because it was not realized by early recorders that three streams come together and contribute to the waters near the outlet into Lake Michigan.

Three sources of information about the matter are currently available: dated maps based upon information supplied by explorers and surveyors; written records of early visitors; and the reminiscences of nineteenth century settlers. Maps, incomplete as they may be in some instances, are actually the most specific and reliable of the records. Early visitors were frequently vague in their references, probably due to the fact that the place was not particularly inviting and served mainly as a stopover. The reminiscences which follow were often hearsay or personal opinion, neither of which are very dependable.

The name or names of the waters at Milwaukee undoubtedly have an Indian origin. It is difficult to determine which peoples to credit, inasmuch as a series of tribes occupied the Milwaukee region over the course of a recorded century and a half, between 1685 and 1835, and before. Who preceded the earliest recorded inhabitants is not known. It is possible that the names ultimately placed on maps or written in diaries came originally from a prehistoric people, but there is no certainty of this.



Portion of a map by Minet (1685) which noted the "melocki R." flowing from a small inland lake into the "lac des Illinois."

In 1685 Minet, an engineer who accompanied the La Salle expedition in its attempt to find the mouth of the Mississippi River upstream from the waters of the Gulf, prepared a map covering the area of the Mississippi Valley and the Great Lakes. In doing this, he had access to a large map made by La Salle, which is now unfortunately lost. On Minet's map one notes the "melocki R." The stream is shown flowing directly from west to east, from a small unnamed inland lake into the "lac des Illinois." It is obvious that La Salle, who originally did the recording, never ascended this river, but possibly saw the Menomonee and concluded that it was the main or only stream. He must have heard the name from the local inhabitants. How else could he have determined it?

Louis de la Porte de Louvigny, a French officer sent to Mackinac by Frontenac when certain Great Lakes tribes were threatening to rebel against the French, is credited with a map dated 1697. Here the writing is a bit obscured but reads "R Mell—akiki." The river flows, as in the previous case, from west to east and enters the "Lac du Michigane ou des Illinois."

Another map by Guillaume Delisle, dated May 1718, shows the "Mel-leki R" flowing into Lake Michigan from the northwest. At the outlet, north of the mouth of the river, a village is indicated which is spelled "Miskouakimina." A later map by Delisle, made after 1718, is similar and shows the river, unnamed, flowing from a lake to the southeast. Miskouakimina is again noted. This can be nothing less than the village on the sand spit, erroneously presumed to be the village OF (not AT) Milwaukee.

"Riviere Milowagues" is shown on the 1778 map by Thomas Hutchins. The map was published in London. As a Colonial, Hutchins was imprisoned in England. Upon his return to America, he joined the southern army under General Nathaniel Green and, in 1781, was commissioned as geographer of the United States.





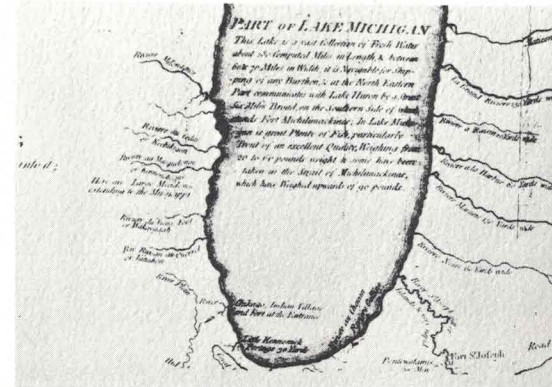
Portion of a map by Guillaume Delisle (1718) showing the "Melleki R." and also the village "Miskouakimina."

Two maps dated 1812 by Thomas Forsyth are in existence. Forsyth wrote to General William Clark on December 23, 1812, concerning the locations, manners, and temper of the Indian tribes in the area depicted on his maps. One map notes "Millwaukee Post and River." The other indicates "Post" only.

Other maps note the name in various ways. The 1815 map of René Paul, city engineer for St. Louis, who did surveying in Indian territories, shows "Melwaukee" with two tepees south of the river mouth. A village and the word "Melwaukee" are shown on the map of John Melish, dated 1819. The map of Joseph M. Street, Indian agent at Prairie du Chien in 1827, indicates the "Millwaukee R." Lucius Lyon, on a map c. 1830, noted as made in conformance with the stipulations of the Treaty of Prairie du Chien, shows the Milwaukee River as "Milwalky R" and the Menomonee River as "Manawalky R."

It is recorded that in 1679 Father Zenobe Membre, who was at that time with La Salle, referred to the *Milleoki* river and the Indians living there. Twenty years later (1699) Father John B. de St. Cosme called Lake Michigan "Mie-sit-gan" and the Milwaukee River "Melwarik." St. Cosme refers to this being the river where there is a fair-sized village. Having seen several days of foul weather the party rested for two days and shot quantities of duck and teal. It is important to remember that the name was applied to the river; the village was not named.

Lieutenant James Gorrell, who describes experiences in 1761 as the representative among certain Indian tribes around Lake Michigan, refers to *Milwacky* in his journal. Major A. S. de Peyster, the British commandant of Michilimackinac during the American Revolution notes, under the date of May 13, 1779, that Langlade "reached Milwackie." On the second of May of the same year, de Peyster had spelled the name "Milwaukee." The Rev. Jedidiah Morse, in his report to the Secretary of War, 1822, of a tour of Indian tribes, spells the name *Milwackie* and also *Mil-wah-kie*. In his



Portion of map by Thomas Hitchens (1778) in which he named the "Riviere Millewaques." Two unnamed streams are shown flowing into it.

journal of a visit to the Mississippi in 1777 to '78, Charles Gautier de Verville, a nephew of Charles de Langlade, noted that "I left . . . a belt . . . for Milwaki." Captain Thomas G. Anderson, a trader in Milwaukee in 1803 to 1806, stated that he was offered the post at *Minnawack* (or *Millwackie*).

There are no dependable dates for the arrival of any of the Indian tribes which have been recorded as representative of the Milwaukee area. In later references to it, the village at the mouth of the river was usually identified as one of mixed peoples. Included in the many notations were Mascoutens, Chippewa, Ottawa, Potawatomi, Menominee, Sauk, Fox, and Kickapoo. Treaties and land cessions between the Indians and the Government merely legalized ownership in the United States and identified the several tribes as previous occupants and claimants. In one form or another, throughout the several occupations, the name which ultimately became Milwaukee persisted.

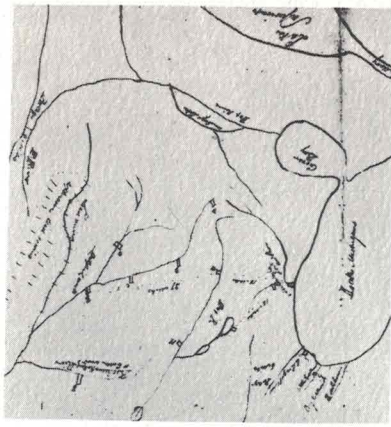
Aside from the map references we have the following. Under the date of November 23, 1674, Marquette wrote, "They were maskoutens, to the number of 8 or 9 cabins . . .," referring to the Indians in the village on the sand spit at what was then the Milwaukee River outlet.

Membre noted in 1678 that Mascoutens dwelt near the mouth of the *Millioki* River. Referring to the same place in 1698, St. Cosme stated that the village had been a large one "consisting of Mascoutins, of Reynards (Foxes), and also some Poux (Potawatomes)."

Minet, in 1685, while identifying the river quite accurately, placed the Mascoutens more in the Chicago region. Allowing for the obvious distortions in the delineation of his map and the crowding of names in the general area, one may be forgiven for suggesting that the Mascouten notation should be interpreted more broadly, particularly in view of the fact that both previous and later references bear out such an assumption.

On a map dated 1688 Jean-Baptiste Louis Franquelin, who served as





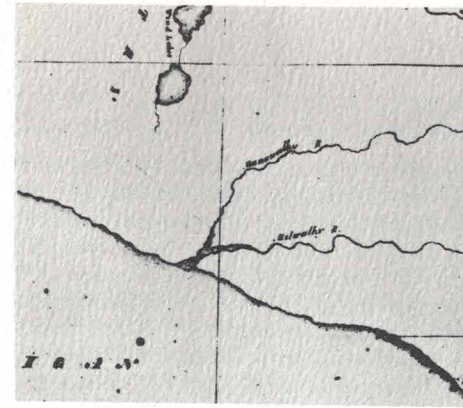
Portion of a map by Thomas Forsyth (1812) denoting the "Millwaukee Post and River." The map is unusual in that it apparently is meant to be read with the direction West at the top of the map.

draftsman to La Salle, showed the Mascoutens in the Milwaukee region, well below Lake Winnebago. Delisle, in 1703, did the same. He produced two additional maps in 1718 in which he showed the Mascoutens as far south as Chicago. This series of references, 1674 to 1718, pins the matter of those people in the area down quite firmly. For almost a century there were no recorded inhabitants except that Gorrell noted that the Ottawa were at *Milwacky* in 1761. The other tribes noted in subsequent U.S.-Indian treaties came in later.

Regarding the Mascoutens, Alanson Skinner noted the fact that there were differences in language and general ethnology between the Potawatomi of northern Wisconsin and the Mascoutens, whom he identified as Prairie Potawatomi. He stated that the name was applied by the Potawatomi to one of their minor bands only, but that it gradually spread to all bands lying south of Milwaukee. Unfortunately, Skinner included no dates for these statements. One might ask how different the languages were when Membre visited the *Millioki* River.

According to Andrew J. Vieau, Sr., his father Jacques arrived at Milwaukee in August 1795 and at the mouth of the river met a "large number of Pottawatomies, but mingling freely with them were Sacs and Foxes, and a few Winnebagoes, who had married into the other three tribes." Antoine Le Claire, Jr., the son of the well-known trader, stated in his remarks to Lyman Draper that, when his father came to Milwaukee in 1800, a village, apparently on Walker's Point, was composed mainly of Potawatomi and, although a few Ottawa were among them, there were no Chippewa. Captain Thomas G. Anderson, a trader here in 1803-06, stated that he was offered the post at *Minnawack* (or *Millwackie*) and that he went "among the Kickapoos." By context there can be no doubt but that he meant these were located at Milwaukee, although this presents a question of tribal occupation. He later stated that "The Indians—Pottawatomies—in this locality were docile, and easily managed . . ."

In this connection, Franquelin, on his laterally distorted map, showed the Kickapoo on what appears to be the Rock River which he called "R. des Kicapoux." Allouez stated in his account of 1667 to '70 that the Kick-



Portion of a map by Lucius Lyon (1829) showing two streams, the Milwaukee River as "Milwaukee R." and the Menomonee River as "Manawalky R."

apoo ". . . formed a village with the Kitchigamisch and both spoke the Maskoutench language . . ." Apparently there was a great difference between this and the other Algonquian languages. Schoolcraft was of the opinion that the Mascoutens together with the Kickapoo were parts of one tribe. *The Handbook of American Indians* identifies the Kickapoo as a tribe of the central Algonquian group, forming a division with the Sauk and Fox with whom they have close ethnic and linguistic connections. The Kitchigami were related to the Mascoutens but were presumably absorbed by the Kickapoo and Mascoutens and lost as an identifiable group. The interrelationship of this division is rather with the Miami, Shawnee, Menominee, and Peoria than with the Chippewa, Potawatomi, and Ottawa.

The Indian land cessions cast some additional light on the question of tribal occupation. The treaty of St. Louis, August 24, 1816, referred to "Ottawa, Chippewa, and Potawatomi residing on Illinois and Milwaukee rivers and their waters." In 1822 Morse remarked that a few Menominee were at Milwaukee on the west shore of Lake Michigan. In addition he wrote, "I have since been informed by some of the old men of the two nations, that the Sauk and Fox nation . . . have since built villages and lived . . . at *Mil-wah-kie*. . . ." The intertribal treaty of Prairie du Chien, August 19, 1825, included a general recognition of the Menominee claim as "extending as far S. as the Milwaukee river. . . ." The cession, dated July 29, 1829, reiterated the names included under the treaty of August 24, 1816. Furthermore, the great Menominee cession of February 8, 1831, at Washington, D. C. included the phrase ". . . Menomonees further cede . . . beginning at the S. end of Winnebago lake and running in a direction to Milwauky or Manawauky river, then down said river to its mouth. . . ." The eastern boundary of the area was Lake Michigan. On September 26, 1833, at Chicago, the Chippewa, Ottawa, and Potawatomi ceded the tract extending from Fond du Lac southwest to Rock River and to the Illinois border; from Fond du Lac southeast to the western boundary of the Menominee cession of 1831, and thence along the lake shore from the mouth of the Milwaukee River to the Illinois border. This substantiated the occupation or claim reference of 1816 made at St. Louis.

Accordingly, while there was no assurance on the part of the Government that those tribes were actually living at Milwaukee, the land claims



were acknowledged and, in agreement with recorders of the time, it may be accepted that actual residence was or recently had been a fact.

Of the many references presuming to identify the meaning of the name, Milwaukee, only a few will be discussed, inasmuch as original sources have been quoted by most writers, some not without error. Peter J. Vieau, one of the sons of the trader Jacques Vieau, said, "Milwaukee is a corruption of *maunahwaukee* (place of the gathering of multitudes)." The Western Historical Company's volume notes that "an old Indian from the head of the Des Moines River says it means everybody's place; that is, where all may or do meet." In the same work Mrs. Victoria Porthier, a daughter of Mirandeau, a resident of Milwaukee who died in the early 1820's, is quoted as claiming that in the original tongue the name was *Mahn-ah-wauk*, which means the great council place; great camp to talk as friends; ground where everybody comes, but on which nobody fights.

From certain unpublished notes of Increase A. Lapham, undated but after 1853, we glean the following: "Milwaukee (Alg); *ake*—Shaunee; *hakes*—Sauk; *ahke*—Chippewa: land, earth. *Woke*—plural number, Chippewa; *kee*—you or thou, Chippewa; *millaw* (Alg)—give it him. Formerly *Mahnawaukee*—Indian languages normally have not the sound of L. Using the Chippewa: 'Plural number-land,' 'the place of many people.'"

Another reference in the Western History's volume stated that a comparatively recent writer who claimed to have been a Winnebago interpreter said that the name should be spelled "*Mee-lee-waug-ee*," which means stinking water. The writer was not identified, but his interpretation would place the swamps of Milwaukee on a par with the shores around Green Bay, occasionally, but erroneously identified as "stinking water," and the low portage of Chicago, sometimes referred to as the "Place of the Skunk." The western shore of Lake Michigan seems to have had a strong reputation. Actually, the name is not of Winnebago origin.

In his *Reminiscences of the North West*, B. F. Witherell, who discussed the years 1818 to 1835, referred to "Mil-wau-kee, pronounced by the Indians *Me-ne-au-kee*: a rich or beautiful land." Samuel Stambaugh, in his *Report . . . of the . . . Wisconsin Territory*, said in 1831 that "The Indians have marked the land bordering on the Manaywaukee river, as being of a superior quality by the name they have given the stream. 'Manaywaukee' signifies 'scarce a good land.' The interpretation into our language means 'the river of good land.'" At least Stambaugh hit the river correctly, if not the meaning of the name. In 1857 Augustin Grignon, a grandson of Charles De Langlade and for years a trader, remarked, "I have also understood, though without placing so much confidence in it as in the other definition, that Milwaukee meant simply *good land*." This reference, published in 1857 and possibly transmitted to others orally even before that date, may well be one of the origins of this tradition which, often enough repeated, became through sheer weight of repetition accepted as fact, any doubt being carefully deleted by later writers and editors.

Grignon's major contribution, the "other definition" alluded to, is the following: "I was once told by an old Indian that its name (Milwaukee)

was derived from a valuable aromatic root used by the natives for medicinal purposes. The name of this root was *man-wau*; and hence *Man-a-wau-kee*, or the *land or place of the man-wau*. The Indian represented that it grew nowhere else, to their knowledge; and it was regarded as very valuable among them, and the Chippewa on Lake Superior would give a beaver skin for a piece as large as a man's finger. It was not used as medicine, but was, for its fine aroma, put into almost all of their medicine taken internally." To this Wheeler added in 1861, "But as there is no valuable aromatic root found in this country that does not grow elsewhere in the State, and as Mr. Grignon, immediately afterwards, states that he also heard that the title meant simply 'good land,' we are compelled to discard the vegetable derivation."

Western History's editor tended to paraphrase quotations and to make changes in quoted records, for which reason the volume is more than a bit suspect when it comes to accuracy. In this case the change is from the beaver of Grignon's memory as the item of exchange, to a bear skin. Could *man-wau* actually have been a medicinal root, something of the order of licorice root, which a trader supplied? The true origin of it could have been lost, and it could have been attributed to Milwaukee as an original source (i.e., grown here) instead of as a place where it could be obtained by trade. Or should the entire matter of *man-wau* be written off as another phonetic dream and forgotten?

There can be little conflict with the idea that the Chippewa, for example, identified the name as meaning something akin to "beautiful place." However, this could have been a rationalization on the part of the informant, an attempt, possibly upon request from a white investigator, to give the meaning in *that* language or dialect, to sounds which preceding peoples had assigned. The old, original name goes back to the Mascoutens, if not to an even earlier people, and translations from recent occupants are questionable. One might be tempted to suggest, as a parallel, an Englishman coming to German-speaking Milwaukee sometime in the 1860's and being impressed with the inhabitants' preoccupation with the small swinging barriers on their fences. *Wie geht's*, by sound becomes *wee gates*. A greeting becomes an item.

Completely ignored by Milwaukee historians is the remark by Alfred Brunson, whose article on Wisconsin geographical names appeared in the first volume of the *Wisconsin Historical Collections* in 1855. He said, "*Milwaukee*.—From the river of that name. It is Indian.—(Will some Milwaukeean give the meaning?)" Brunson may well have been the voice in the wilderness which started the search.

Reduced to its essentials, the name, changed as it was over the years, was originally Indian. Either the Mascoutens or a previous people assigned the name, changes were made as other groups moved in, and finally it was changed into the phonetics of white visitors, cartographers, and historical recorders. If the origin of the name is lost, it is not unreasonable to assume that its meaning is also unknown. Certainly, however, the name is not for the land; it was the river that was so identified. Even so, it is definitely more convenient to say Milwaukee than *Miskouakimina*.



# HOW TO STOP

# THE WORLD

# AND GET ON

by Shirley Marine  
Information Officer



Visitors who enter the bright lobby of the new Milwaukee Public Museum, with its terrazzo floor and marble walls, including two of Texas limestone with fossil imprints, are greeted visually by a large geophysical globe. Rotating at a speed of one revolution every three minutes this globe symbolically represents the trips through time and space and across ecological boundaries that museum visitors can take while within the experience inducing confines of the fourth largest natural history museum in the United States.

The globe rotates in an arrow-shaped setting that points the visitor to A Trip Through Time. By means of flooring—carpeted or tiled, cemented or blocked—the visitor walks a serpentine route from space to the edge of the Old World, from the edge of the New World to the turn-of-the-century and on to the future. Literally he will cross the lobby from the Old World to the New World; figuratively he crosses the ocean with the explorers and the traders of the sixteenth century who made that journey with hardship and courage.

This is the trip that you as a visitor at the museum can take on the first floor with the help of some of the most creative talent in the city and your own imagination.

Start here in the blackness of endless space with the moon to your left and our planet earth revolving in the far distance. This is the way you in a spaceship might see our planet rotating 500 miles away in a setting of stars, other planets and satellites.

Arriving on earth, you will relive its early days the way the geologist "tells" time, with casts and molds of buried life forms, with rocks and mountain making events. More than 600 million years ago, not Daylight Saving Time but Pre-cambrian Time, algae were the only life forms in eras of volcanic activity, erosion, and glaciers. What animal, plant or marine life is known to man from geologic time, beginning with the Cambrian 470 million years ago, are known as fossils. These fossils are your keys to the Paleozoic Era of invertebrates and marine forms and the Mesozoic Era of reptiles.

Ten and a half feet high stands a stegosaurus, an armored dinosaur of the Jurassic age. The museum's model is as exact as the most painstaking research permits. You stand in front of it with the strange plant life, on which this vegetarian existed, forming the transition from time to time.

Traveling through Cenozoic times, through the age of mammals and modern seed plants, you relive the gradual evolution of the horse, suffer the entombment of mastodons and sabre-tooth tigers in the La Brea Tar Pits of California and anticipate the appearance on earth of that unique mammal called MAN!

You witness a cave painting as it might have been done by Cro-Magnon man 12,000 years ago by the flickering light of a prehistoric fire.

Now you begin the fascinating story of the rise of civilization.

With man's inventiveness and his struggle to control his environment comes agriculture and the domestication of animals, the use of stone, pottery, and wooden and metal tools. You proceed from the Stone Age (2 million years ago) to the Copper and Bronze Ages (2500–1900 BC) and Iron Age (900–550 BC).

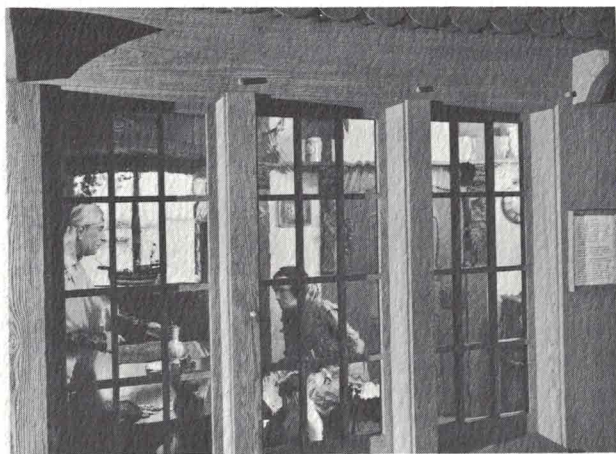


General View of Geology Hall: Stegosaurus on the right



You become a part of ancient Egyptian culture in the temple court of Medinet Habu, built by the Pharaoh Ramses the Third, and in the tomb of two mummies, among other items of Egyptian after-life. In the Near and Middle East many cultures came and went: Sumer, Old Babylon, Kassite, Assyria, Neo Babylon, Persia, Parthia, Sassania, Susa. You can sample their life and the part it played in man's history on earth with the pottery and glass and other artifacts left buried, like geological fossils, by man in his movement in time. You move onto the Hellenic period and Athens and the advancements in civilization that it represents, and then to the Roman period and the conquest and adaptation this Empire brought about. Here you visually step from the atrium into the front room of the Villa of Mysteries in Pompeii. A Dionysian initiation rite is depicted on the beautifully painted walls. The lady of the house, or domina, reclines before you, impervious to your presence or to the volcanic eruption of Vesuvius that destroyed Pompeii. Striped canvas tops a medieval jousting tent that houses the exhibits that tell you about the Holy Roman Empire, the rise of nationalism, the guilds, the church, the crusades, and the art of warfare the time cultivated.

You step into a Counting House of the Hanseatic League, which heralded the Renaissance and the trade, banking and exploration that will encourage you and the explorers of that age to cross the ocean; and the lobby of the museum becomes a step to the shores of the New World.



Hanseatic League Countinghouse

But wait! There are many sidetrips you could still make while journeying through time and space.

Across from the Earth in Fact exhibits are those on crystals and minerals and on the natural processes that continue to shape our planet earth: volcanism, diastrophism, glaciation, weathering and erosion.

With man's appearance on our planet you could view the concepts that have been a part of man's oldest heritage—religion; the various means of communication man has developed in the course of history, from symbols to writing and from the stamping process to the use of the typewriter; and the means of food, defense or death—weaponry, in the form of the museum's outstanding collection of guns.

Cross the Atlantic to the New World now, to witness history as it affected our state of Wisconsin. Take time to visit our state before written history—prehistoric Wisconsin in its rocks and minerals, its various Indian cultures.

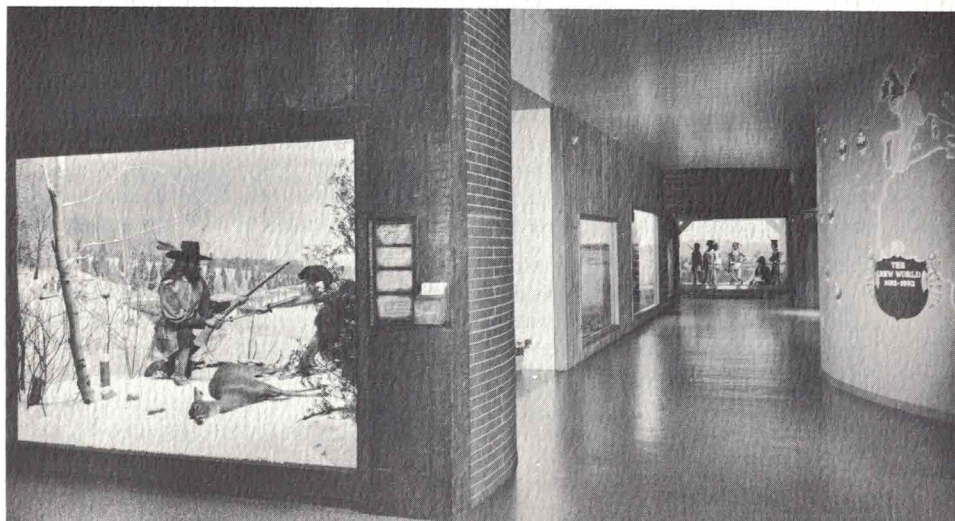
The French regime is represented in the museum with a diorama depicting Radisson and Groseilliers (1659), upstream from the mouth of Milwaukee River, where these French explorers have just killed a deer with a gun, to the wonderment of a Staring Hair Indian. You can visit British Colonial Wisconsin in two rooms of furnishings and additional displays of china and pewter and copper.

The Revolutionary War barely touched the Wisconsin area, but a sloop o'war, the Felicity, did anchor in Milwaukee in search of a defected "British" Indian. Then over the harbor bluff to the year 1822 when Solomon Juneau erected his trading post on what is now East Wisconsin Avenue and the Milwaukee River. You can look south across the marsh to Walker's Point and the meeting of the Menomonee and Milwaukee Rivers.

Now you journey to Fort Crawford and the year 1832, when Blackhawk surrendered, after most of his followers were killed or captured.

Rest awhile in a Wisconsin log cabin from a site in Saukville, representing the 1840's and the immigration that is such an important part of our state's history. To move on to the Civil War period, turn right to look into two windows of elegantly furnished rooms with the chairs, tables and accessories of that era.

From French Period to Blackhawk's Surrender; first floor History Section.







General View of Turn of the Century Street; first floor History Section.

Then take one giant step, with a smile, into the Streets of Old Milwaukee and its turn-of-the-century shops, gaslit streets, nickelodeon, and sweet memories. This is one of the most popular sights in the Milwaukee area. You walk on cedar block, fired brick or granite block, just like Grandma or father used to do. You peer into the windows of the drugstore (apotheker), the candy shop and the general store with its pot bellied stove and countless variety of the necessities of yesteryear. You can wish a good day to the elderly lady sitting on a rocker on the porch of a Victorian frame house or ask directions of the policeman in the call box on the corner of Biddle Street and Grand Avenue.

On the fence next to the lock and key shop, there's a phone on which you can eavesdrop on the conversation between a Milwaukee "hausfrau" and the butcher, and be envious of the prices. For a nickel you can enjoy a silent film, minus the flicker, in the nickelodeon. Every shop window has its special item for each visitor—the remembered rocking horse, the shaving mug, the jar of leeches, the free lunch in the saloon, the hat pin, the roll top desk.

Only your own modern time schedule will move you out of this turn-of-the-century experience to continue your journey in the museum through time and space.

Onward and upward via a very Twentieth Centuryish escalator you head up towards a sunburst on the second floor that points the way to The Great Plains of our United States as it was 100 years ago. Now you have a compass for your guide, for on this floor you have a geographic and ecological path to follow starting at the hooves of a stampeding herd of bison.

Here they come with frightened eyes, forced in their flight by galloping Crow Indians to a path of death. There was more than meat at stake for the Indians, as you will find out in a nearby exhibit. The bison was an integral part of the whole culture of the Plains Indians, whose life and art unfolds before you as your eyes move from item to item, medicine bag to beaded moccasins and blouses, hide painting to spear, travois to ceremonial dance.

Now you can rest again, cross-legged before the fire in a Blackfoot warrior's tipi. Perhaps he will tell you the tales and legend of his proud people, in a sign language you can understand.

Pronghorn antelope and prairie dog direct you to your next journey, which will put you in a prairie schooner to cross the once vast prairie lands of the United States. There were beautiful flowers—purple coneflower, blazing star, prairie sunflower—to make the bumpy journey more pleasant.

The booming noise you hear comes from the Prairie Chicken diorama in which the males court hens in a springtime, early dawn dance.

Discreetly, you move on to the banks of the Missouri River to find you have just missed a boat ride with Lewis and Clark, but that you are in the middle of waterfowl congregated on the shores and in flight.

You step into the Woodlands of Wisconsin to relive the bird and plant life of Horicon Marsh one hundred years ago. Overhead, ducks and geese fly, their taped calls a part of their movement in a simulated sky.

Miniature Wisconsin landscapes depict fen, upland meadow, oak barrens, oak openings, beech-maple-basswood forest, forest margin and the moist sandy beach prairie. These small dioramas are vignettes of ecology—the study of plants and animals in relation to their environmental conditions. With the gravelly soil of the oak opening you can discover the pasque flower, the painted-lady butterfly, and thirteen-lined ground squirrel in an early spring setting. In the beech-maple-basswood forest you might try to locate the brilliant green six-spotted tiger beetle, the eyed click beetle or the mourning cloak butterfly in harmony with a gray tree frog, a wood turtle and the oven bird, among other life beneath or upon the forest foliage and wildflowers.

The white-tailed deer in the nearby large diorama heard you coming and stands poised in a spruce swamp. Wisconsin birds and mammals displayed ahead listen and watch.

In January of 1968 the parade and the dynamics of life were capsuled and displayed with the wizardry and artistry of the museum's preparation division. Here a giant firefly—off and on—lights a dark cave of bioluminescence. A leopard, crouched overhead, stalks you and every visitor emerging from the cave.

For the moment, your journey ends.

However, in January of 1969 you will be able to continue to explore the North American continent, stopping to watch the Menomoni Indians gathering wild rice, to enjoy the Arizona desert, or to visit a Hopi Indian pueblo.

Future years will also give you passage to the circumpolar regions, Asia, the South Pacific, the depths of the ocean, Central and South America and the African continent.





## PRIMITIVE LIGHTERS FROM INDIA

by R. GORDON WASSON, Honorary Curator of Botany

In July 1967, while in the Simlipal Hills of the Mayurbhanj District, State of Orissa in India, I saw some primitive "lighters" in active use among the aboriginal inhabitants. I sent three of these interesting instruments and some examples of their component parts to the Milwaukee Public Museum in August when I stopped in Italy on my way home.

The Simlipal Hills, in east-central India, are about 2500 feet high, the peaks attaining almost 3000 feet. They are a forest area with some clearings, quite virgin and altogether lovely. While not yet open to tourists, one can visit them with the permission of the local authorities, usually

accompanied (as we were) by an official of the forestry department of Orissa. The Hills cover about a thousand square miles, of which more than 400 will become a national park. The forests are said to contain all kinds of game—wild elephants, tigers, leopards, two kinds of deer, monkeys, wild boar, and many others. But as the jungle is well watered and has an abundance of foliage, the animals are not often seen. We were there for almost a week and did not see any wildlife except bedbugs, scorpions, and a few snakes. We did see the spoor, less than a day old, of an elephant.

The Simlipal Hills are sparsely inhabited. There are the Kharia, a food-gathering people living on honey and selling the wax, who speak Oriya; the Kolha or Ho, agricultural communities who speak Ho, a Munda language. The Bhuyan, Bathudi, and Mahakud, all Oriya-speaking, engage in agriculture and the last also in cattle grazing; and the Kamar are blacksmiths, who speak Oriya and Bengali. There are also the Mahji who speak Santali but deny that they are Santals, and one of their number is designated to perform the ceremonial rites that attend agriculture; the Mahali, a Santali caste who weave fine baskets; and finally the Bhumija and Munda, farmers, who are Mundari speakers (a Munda language resembling Santali and Ho).

All of the natives of the Simlipal Hills that we saw used the homemade lighters. They consist of a piece of bamboo from four-and-a-half to six inches long, open at both ends. Each of the ends is capped by one-half of a silkworm cocoon, to one of which there is attached a piece of iron. Inside that end, when the cocoon cap is removed, there are a number of stones, often of quartz but sometimes of flint. When the cap is removed from the other end, one discovers silk that is gathered from the seed pods of a tree like our cottonwood tree. But what you see is charred from actual use. In some of the lighters there is a reserve supply of silk stored with the stones.

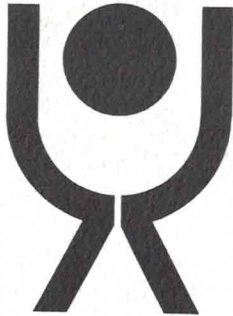
The natives are remarkably proficient at getting a light or flame with these primitive lighters. Holding the tinder side up in the left hand with the fingers gripping the stone close to the exposed tinder, with the right hand (the cocoon top being held within the palm to keep it from swinging) he strikes the stone sharply with the iron. He gets sparks, and after two or three tries, one spark lands on the inflammable tinder and a glowing spot immediately appears. A person unaccustomed to this tries in vain to generate sparks.

The question is how far back the lighters go. As these tribes are without history, it is difficult to determine. Apparently, they are not used in the villages outside the Simlipal Hills. Though I could find no trace of them outside the Hills, it is possible that one could find them elsewhere in Asia. Are they a local invention? And when were they first used? We do not know the answers. However, forms of the same device for producing a flame were used for a number of centuries in Europe. Familiar as we are with the nifty lighters used in the modern world, we naturally jump to the conclusion that the natives adapted the idea to their materials and produced this lighter in imitation. But does this necessarily follow? Could the modern lighter be a perfected device that had primitive forerunners, and is this perhaps one of them?



Project:  
Negro  
Achievement  
October 15-  
November 15, 1967

"The windows of my soul  
I throw wide open to the sun"



In keeping with the suggested theme for the second International Campaign of Museums "The Role of the Museum in the Development of Man," the Milwaukee Public Museum participated in the Milwaukee observance of the heritage and history of the American Negro held Oct. 15–Nov. 15 of 1967.

For Project: Negro Achievement, every major educational institution in the city of Milwaukee was asked to coordinate activities of exhibits, lectures, film programs, television programs, workshops, clinics, and lunches or dinners.

The Milwaukee Public Museum's participation included a special exhibit of West African art objects from the Museum's newly acquired Mam-bila collection and bronze sculptures depicting East African tribal members, weekly film programs on Negro history and African art, a special showing of the film classic "Green Pastures," a lecture by the director of the Museum of African Art in Washington, D. C., and a lecture on African roots of New World music. The opening program for the month long observance was held in the Milwaukee Public Museum with addresses by civic officials and leaders including Henry Maier, Mayor of Milwaukee, and Robert C. Henry, Negro Mayor of Springfield, Ohio. The second part of the program consisted of a reenacted demonstration of a West African naming ritual and drum music and native dancing performed by members of the Milwaukee Chapter of African Students in America Organization.

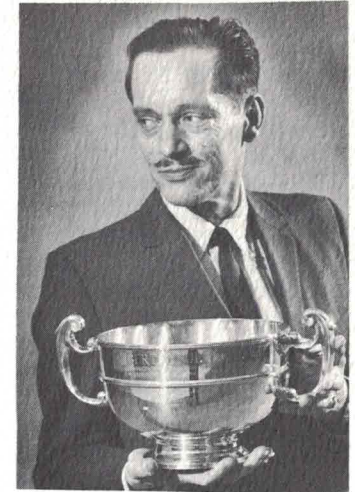
The Milwaukee Public Museum's guiding philosophy for the 1967 International Council of Museums' campaign was to take the theme—"The role of the Museum in the Development of Man"—literally, rather than historically or philosophically. With the urban unrest that afflicts our country, the museum dedicated itself to helping the living man by instilling in him a pride in his heritage and a hope in his future. Its participation in Project: Negro Achievement, was part of that effort.

SHIRLEY MARINE, *Information Officer*



## FULLER BOWL

Milwaukee Sentinel Photo



The 1967 Fuller Award was presented to John Luedtke, acting curator of Classical, Decorative and Oriental Arts, for his many services to the program committee of the Friends of the Museum and to community organizations.

Luedtke has been general exhibit chairman of the Folk Fair for six years. At the 1966 fair, in honor of his contribution, the museum received a \$1,000 Pabst Blue Ribbon Award for contributing the most to the 23rd annual fair.

The Fuller Award, which consists of a silver bowl and \$100, was established by FOM in 1964 and received its name in honor of the first recipient, Albert M. Fuller, former assistant museum director, who retired in 1964. The bowl is a perpetual trophy on which the names of recipients are inscribed.

## BOOK REVIEW

*A Cabinet of Curiosities* edited by Walter Muir Whitehill. Charlottesville, University of Virginia Press, 1967. \$5.75.

An entertaining collection of histories of five early American museums, this book is laced with amusing anecdotes and quotations in the sometimes quaint English of the nineteenth century, drawn from archives and other sources. The American Philosophical Society, the American Antiquarian Society, and the Smithsonian Institution have attained distinguished international reputations, though the first two no longer operate museums. The Western Museum of Cincinnati and the Clark Indian Museum dissolved long ago.

The archives of most societies of the early nineteenth century contain statements of the founder's noble intentions "to promote knowledge" or "to contribute to the advancement of Arts and Sciences." Donations from well-meaning contributors, whose concepts of the value of their gifts to posterity were governed by personal opinion and sentimental circumstances, burdened such bodies with a continuing struggle against the acquisition of "undifferentiated curiosities" and "worthless and trashy articles." Because of this embarrassment of riches, much of their history is



involved with the suitable disposition of their collections. Amusing situations are revealed in the personalities of the men who worked for the institutions. Librarian Haven of the American Antiquarian Society kept his office at a temperature of 80°, while in the stacks the temperature was 40° and in the museum, 20°. Scarcely an invitation for use and visitation. A large part of the history of these museums is the contentions between librarians and museum curators. The long struggles resulted in the final demise of the museums of the American Philosophical Society and the American Antiquarian Society and their ultimate concentration on research libraries. The Smithsonian, however, remained in the museum business.

William Clark, one of the heroic leaders of the Lewis and Clark Expedition, ran a most reputable Indian Museum in St. Louis from 1816 to 1838. His strategic location at the gateway to the West and his influence with many tribal chiefs made his combination museum and council chamber quite outstanding, attracting many distinguished visitors whose journals contained favorable descriptions of the museum and of General Clark as a curator.

A lively chapter describes the Western Museum of Cincinnati which from 1820 to 1867 was the 'Disneyland' of the nineteenth century. Founded with solemn aspirations to cultural and intellectual development, it foundered financially in three years. A superb showman, Joseph Dorfeuille, then assumed its directorship. A learned man, but also practical, he assembled spectacular displays to attract the public. Wax figures, embellished and automated by the artistic and mechanical genius of his assistant, Hiram Powers, soon added a circus atmosphere to the formerly austere halls. The 'museum' disintegrated into a sideshow with macabre displays including a scene of Hell.

The final chapter describes Secretary Joseph Henry's struggles against Congress and his assistants in maintaining his conception of the purpose of Smithsonian, the English donor of the more than half-million-dollar legacy to the United States, to found "an establishment for the increase and diffusion of knowledge among men." To Henry the phrase always meant the establishment of an institution for research. Congress pressed for a museum in which to deposit the national treasures. In the present Smithsonian Institution and the string of museums attached to it, though physically separated from it, a happy compromise was made.

A *Cabinet of Curiosities* provides delightfully sophisticated amusement as well as good background history for anyone interested in museums.

IRENE HANSON, *Museum Librarian*

#### A NEW MUSEUM PUBLICATION

*Bilbao, Guatemala: an Archeological Study of the Pacific Coast Cotzumalhuapa Region I* (Publications in Anthropology No. 11) by Lee A. Parsons. 197 pp., 77 figs., 23 pl.

A report describing the pre-Columbian ceramics of the Bilbao ceremonial site on the Pacific coast of Guatemala. The study was made during excavations in 1962 and 1963 with grants from the National Science Foundation to the Milwaukee Public Museum and the St. Paul Science Museum.

The book may be obtained at the Museum Sales Counter for \$6.50. FOM members receive a 20% discount.

## MILWAUKEE PUBLIC MUSEUM

Founded by  
The City of Milwaukee, 1883  
"To remain . . . as a free museum for public instruction and the preservation of materials and helps for scientific investigation."

President . . . . . Dr. William M. Lamers

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