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ABSTRACT

The 15 museums featured demonstrate the convergence of two ideas--the development of new kinds of museum experience, especially for the young, and the ongoing search for significant out-of-school educational opportunities. These museums provide students with educational experiences typically not possible within the schoolhouse. The purpose of these case studies is to render more visible the museum-education idea, to show the variety of programs and facilities that have emerged from disparate beginnings and yet have similar purposes, and to suggest some issues, facility implications, and funding sources for those planning such facilities.
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HANDS-ON MUSEUMS: partners in learning

A Report from
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FOREWORD

This report was undertaken by EFL to demonstrate the convergence of two ideas—the development of new kinds of museum experience, especially for the young, and the on-going search for significant out-of-school educational opportunities. Hands-on museums such as those discussed provide school students with educational experiences typically not possible within the schoolhouse. It's clear that those communities fortunate enough to have such places, cherish them, and hopefully more communities will see to their creation.

Hands-on museums also seem to be changing the nature and purposes of museums generally. Witness the places started as children's museums, and now serving a broader constituency.

EFL's purpose is simply to render more visible this museum-education idea, to show the variety of programs and facilities that have emerged from disparate beginnings yet all with similar purposes, and to suggest some issues and facility implications for those who might be tempted to go and do likewise.

Information gathering, site visits, and basic report writing were undertaken by Bob Feild, architectural designer and consultant, with support from EFL. The costs of producing the publication were provided by the Architecture + Environmental Arts Program of the National Endowment for the Arts as part of a larger EFL-NEA effort to develop useful information on facilities for the arts.

Finally, EFL would hasten to point out that a few school districts have created manipulative, experience-based museum-like centers on their own. One of the most extensive and creative is Cleveland's Supplementary Education Center; another is Dayton's New Visions, housed in part of an 1880 school building.

PREFACE

In the past, museums earned the reputation of being the somewhat stodgy keepers of our culture's most prized objects. Docents led schoolchildren through the museum's halls with occasional admonishments to be quiet and orderly. On weekends, families arrived; the parents pulling kids along to expose them to a genuine cultural experience.

But today there exists a small but growing number of museums that are experience-oriented rather than object-oriented. These institutions are primarily concerned with bringing the visitor and the museum's resources together in such a way that learning can occur. A concept basic to this approach is that the visitor can learn the most through an experience in which he is an active participant. Such participation may take the form of touching artifacts or live animals, trying out an experiment, measuring your own pulse rate, going on a fossil dig, or playing a game with a computer. In short, it's a hands-on, get-involved approach, rather than a hands-off, just-look approach.

It's difficult to categorize these hands-on museums. Some call themselves children's museums. Others are labeled youth museums, junior museums, nature museums—there's even an Exploratorium. And, to make categorization more difficult, these institutions share some characteristics with

the typical museum. Most have a few exhibits that are locked away in glass cases; some information is communicated by the written word, not by direct experience.

But however they are categorized, these museums are making a vital contribution to their communities. They have become independent learning centers that serve school systems, families, teachers, and anyone who delights in learning. Each museum has established strong ties with school systems in its region and is expanding its educational programs.

This concern for education is no accident. Many of these museums were founded by teachers and parents who were concerned with the quality of education in their community. They found the typical classroom experience to be cut off from the real world; books and filmstrips were no substitute for live animals and real artifacts, actual demonstrations and field trips.

This insight led to the design of environments that allow the visitor to get into the dynamics of a given situation, rather than stand apart and simply observe. The Boston Children's Museum explains the result with a simple example:

"A simple pair of Eskimo snow goggles can tell us volumes about the harsh demands of the arctic, of relief from

squinting at ice floes in the glare of the low spring sun, the craftsmanship of the Eskimo and even the shape of his face. But the goggles will not tell their story while locked inside a glass case, even when 'explained' by a neatly typed label. Snow goggles are not to look at . . . they are to look through."

With this concern for direct experience, these museums have expanded their range of subject matter to include the stuff of everyday reality: how our bodies function, the principles of photography, how to make things out of industrial scraps, the ecology of an ocean beach, modern jazz. The Boston Children's Museum organized the Centre St. Fair in 1973, a joint effort between the museum and merchants along a nearby commercial street. Stores, restaurants, a bank, a printer, a barbershop, all organized events and invited visitors in to see how they operated. Clearly, these museums emphasize a process of learning, not a specific product.

While some of these institutions are new, others have been around for a long time. For example, the Brooklyn Children's Museum was established in 1899. Through the 1950s, its focus was on after-school clubs and programs for local children. But like other hands-on museums, it was uniquely qualified to respond to the issues of the 1960s: increased attendance in schools, a disenchantment with traditional curricula, the lack of motivation found in media-blitzed kids. The museum responded with a new building of radical design, an experience-oriented exhibit environment, and a stronger emphasis on teacher workshops.

Museums of science and technology have also contributed to the development of these experience-oriented museums. Founded in 1926, the Chicago Museum of Science and Industry is a prime example. With its operating coal mine and its captured German submarine, the museum has pioneered the development of exhibits concerned with contemporary experience. Science museums were the first to develop demonstrations activated by the button-pushing visitor, a first step toward participatory exhibits. Many science and technology centers have developed into independent educa-

tional centers with a full range of educational programs.

To date, these museums have received little notice. They are not in crisis, threatened with extinction; rather, they are growing rapidly. Attendance has increased dramatically; programs have expanded, and public support has risen. Each museum reports an increasing number of inquiries seeking information about starting an experience-oriented museum.

In releasing this report, EFL has chosen to document a success story. EFL feels that the experience-oriented museum may have an increasing role to play in the education, not just of children, but of individuals of all ages. These institutions are evolving rapidly and are independent of any single source of support. They have proven that they have the support of their communities—not just the big donors but thousands of local subscribers.

Yet they are often looked upon by people in the museum field as junior members of the club operating on the fringes of the profession. They require no trained eye; they are concerned less with high culture than they are with popular culture. Consequently, they have existed as an isolated phenomenon with little research or support at the national level.

There are signs that this may be changing. In 1962, directors of a number of youth museums banded together to form the American Association of Youth Museums (AAYM), a sub-group of the American Association of Museums (AAM). In 1973, 17 institutions created the Association of Science-Technology Centers (ASTC). To date, the AAYM has limited itself to annual meetings of the directors prior to the AAM annual meeting. ASTC has had a more active meeting schedule and has received grants from the National Science Foundation, the National Endowment for the Arts, and the National Museum Act. Linking the world of museums and the world of education, experience-oriented museums are being considered in many communities. As with any emerging institution, the new can learn from those who have gone before. Hence, these brief case studies, and some observations, especially about the evolution of facilities.

CASE STUDIES



The Fort Worth Museum of Science and History

Fort Worth, Texas

The average visitor may think of a museum as just a pleasant place to stroll on a Sunday afternoon. But over 6,000 people a year are doing much more than that at the Fort Worth Museum of Science and History. They are enrolled in the largest museum school in the country taking classes and workshops in everything from film making to comet watching, fossil collecting to soap carving. And some of the offerings seem distinctly out of place—dog training, bicycling, pantomime, archery, and guitar lessons. In addition, during 1973 nearly half a million visitors used the museum's facilities in less structured ways. But it's all part of the client-oriented approach taken by the museum's director, Helmuth Naumer. If 10 people are interested in a course and the museum can find a teacher, they'll offer the course. Naumer feels that the museum has a unique and marketable product: a teaching environment that is rich in objects that have meaning.

The most striking demonstration of the success of this approach comes once a year when parents wait in line for hours to register their children for the museum's preschool program. And it's not just a matter of being popular or fashionable. Paid teachers and assistants work with groups of under 20 children in classrooms located in a wing of the museum. A two-hour session for three year olds will feature a specific theme that ties together the museum artifacts, musical instruments, animals or whatever that are brought into the classroom for that session. Rather than lecture to the three year olds, the teacher waits until the children ask a question about the new museum pieces in the course of their play. This preschool program, with its object-oriented approach, has expanded to serve over 750 children per year.

What was to become the Fort Worth Museum of Science and History was begun in 1939 by a group of teachers who persuaded their principal to let them have a classroom to house objects used in their teaching. By



1945, the collection was moved to a large house and became known as the Fort Worth Junior Museum. The museum moved to its present location in 1954 after the city passed two bond referendums that provided a total of \$800,000 for the new facility. Subsequent additions have brought the floor area up to 88,000 sq ft containing exhibit halls, classrooms, and a planetarium.

Included in the above additions are the Dr. May Owen Hall of Medical Science and the Hall of Physiology. The medical science hall details the progress of medicine from stone age man to the present, while the physiology hall demonstrates the various systems of the body. Sponsored by the local medical association, physiology hall was not too successful, so the museum staff evaluated the exhibits and decided to rebuild the hall with new exhibit designs that required visitor involvement.

Funding for museum operations comes from several sources; the city of Fort Worth provides close to 40% of the annual budget with a slightly smaller percentage coming from visitor and student fees. The United Fund and the county provide the remaining percentage. The Fort Worth school system provides a full-time school coordinator based at the museum. The museum has tour packages designed for the various units of the state curriculum. The coordinator lines up the appropriate tours for school groups and schedules them into the museum.



The Corpus Christi Museum

Corpus Christi, Texas

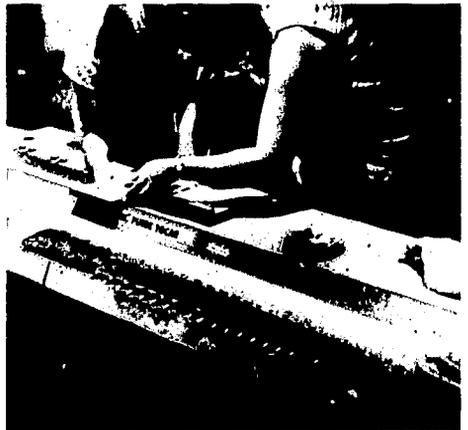


On any given Sunday afternoon, the Corpus Christi Museum is filled with an enthusiastic crowd of visitors—old, young, white, black, and Mexican-American. Located one block from the Gulf of Mexico, many of the exhibits are concerned with the ocean and marine biology. The new Phase Two Building just completed houses exhibits that reveal the heritage of Corpus Christi's ethnic groups. Thus, Corpus Christi's large Mexican-American population is reflected in a prominent exhibit on Mexican culture. The Greek Orthodox, Jewish, and Czech communities are also represented by exhibits.

This concern with aspects of the local community is matched by a concern for face-to-face interaction between the museum staff and visitors. The director, Aalbert Heine, describes how a good staff person could introduce a small group to information about history, anthropology, mechanics, antiques and much more with just a rusty nail as the object of investigation. Heine sees the museum as a set of props for story telling and information exchange; he demonstrates the effectiveness of this approach every

—a half hour of Heine and two youngsters discussing an object or animal, brought from the museum.

The museum got its start in 1957 when the local chapter of the Association of Childhood Education returned from a meeting in Fort Worth convinced that Corpus Christi should have an institution like the Fort Worth Children's Museum (now the Fort Worth Museum of Science and History). The museum subsequently started operations in a former USO club that was provided rent free by the city.



The Corpus Christi Museum quickly grew into an institution with a comprehensive program and an active group of supporters. Unlike Fort Worth, the museum chose to not limit itself by calling itself a children's museum, junior museum, or youth museum. Corpus Christi (population 200,000) had no history or science museum and so the new museum filled those needs, as well as providing hands-on experiences for youngsters.

In 1964, the museum's board of directors asked the city for a site for the construction of a new museum, and \$400,000 for the construction of the Phase One Building. The city provided the site, a bond issue was passed, and the museum staff joined the city payroll. Completed in 1968, the one-story Phase One Building contains 26,000 sq ft of exhibit space, workshops, and offices. In 1973, the Phase Two Building was completed—again 26,000 sq

ft, essentially a mirror image of Phase One with a connecting entry lobby. A gift from an individual financed the Phase Two Building; however, a jump in construction costs from \$15.50 per sq ft to \$25.00 per sq ft necessitated another bond issue to complete the building.

As city employees, the museum staff may lack their earlier freedom to speak out on environmental and conservation issues. The support of the city council is vital to the operation of the museum and its rapid growth necessitated such support. The school system provides a full-time school coordinator to the museum and over \$15,000 per year as a direct grant. Director Heine has worked to establish the museum as an independent institution concerned with creating a thirst for knowledge, not merely as a caretaker of objects that augment a school curriculum.



The Museum of Science and Natural History

Little Rock, Arkansas



The old arsenal building in Little Rock was constructed by the federal government in 1838, as the headquarters building for a munitions assembly complex. Since 1941 it has been the home of the Museum of Science and Natural History and the land surrounding the museum is now MacArthur Park, also the site of the Arkansas Art Center. Since the arrival of director John Preston in 1968, the museum has developed an environmental education program that operates out of community centers in the summer and takes artifacts and specimens into the classrooms during the school year.

This emphasis on an outreach program is due, in part, to the limited facilities available in the old arsenal. With about 10,000 sq ft of exhibit space, basement corridors have turned into exhibit areas and the mechanical room has become the home of two owls, four snakes, and a number of other specimens. Preston feels that the present program needs at least six classroom spaces, to operate effectively; obviously, a new facility is



A feasibility study has been completed that looks into the possibility of such a new building. The study recommends the planning and design of a new building to be located in MacArthur Park and the reuse of the arsenal for more appropriate museum exhibits. Because of citizen opposition to additional buildings in the park, the study calls for an underground facility with a botanical garden covering 15 acres above the museum. The 70,000 sq ft building is estimated to cost \$3 to \$5 million.

Financing such a construction program will be difficult. At present, the museum provides its services on a budget of just over \$100,000 per year. Although the school systems benefit directly from these services, they have not contributed funds to the museum. Now that the museum has a number of years of service to the school systems under its belt, the systems may begin to pay for the museum's outreach programs. At present, most of the museum's operating costs are provided by the city through the Department of Parks and Recreation.

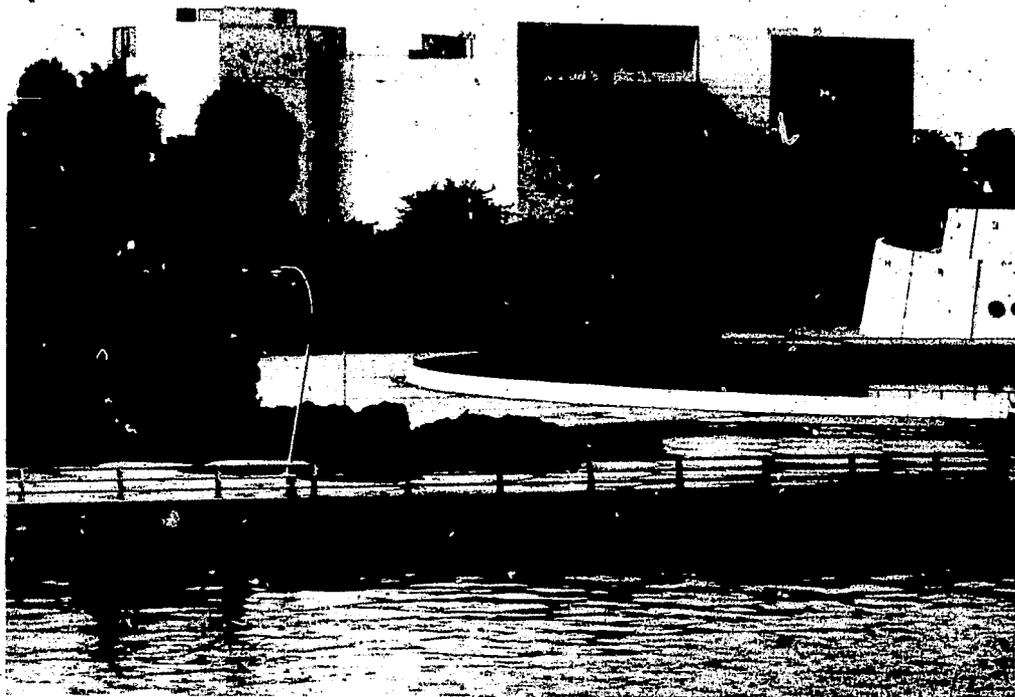
For the museum to undertake a multi-million dollar construction program,

support will have to come from the state level. Since the new facility will develop its exhibit program around the natural sciences in Arkansas, state support seems quite appropriate. In addition, the planning study calls for the museum to broaden its constituency, to develop adult programs and family activities as well as student-oriented programs. The governor recently signed a bill giving \$100,000 in state support for the operation of the museum. This will enable more education programs to be added and help toward the creation of a museum of science and history that will truly serve the whole state.



The Jacksonville Children's Museum

Jacksonville, Florida



From the outside it is fortress-like, with imposing concrete towers at the four corners of a compact, concrete cube. Inside, it is clearly for children as kids climb all over a sculptured lion reclining in the center of the entry space and queue up for a showing of a science fiction film in the planetarium. The 26,000 sq ft new building, completed in 1969, is located on a site in St. John's River Park leased from the city for a \$1 per year.

Unlike most museums, the exhibits are designed as total environments, not just as artifacts in a glass case. The health exhibit features a huge human mouth and throat that kids crawl through to see a presentation on nutrition. Like most children's museums, Jacksonville has an Egyptian mummy but here it is reached through a narrow passage lined with hieroglyphics and bathed in an eerie light. Other exhibits deal with African culture, prehistoric animals, the history of photography and film making, and Indian tribes.



It all began in 1935 when several elementary school teachers, who were interested in teaching with artifacts, began developing a teaching collection that they eventually exhibited in the windows of a local bank. It wasn't until 1945 that the museum was officially chartered and a board of directors selected. With support from the Junior League, the museum bought a large old house, renovated it, and opened the Jacksonville Children's Museum in 1948. By 1954, the museum was receiving financial support from the city, the county, the school system, and the Community Chest (now the United Fund).

Inevitably, the old house became too small for the expanding programs of the museum. Planning began in 1965 for the new building that was financed entirely by private contributions. A total of \$750,000 was raised with the largest single donation of \$100,000 coming from the Junior League. Designed by architect William Morgan, the new building was completed for the remarkably low cost of \$16 per sq ft. The four towers house classrooms, office space, a planetarium, and



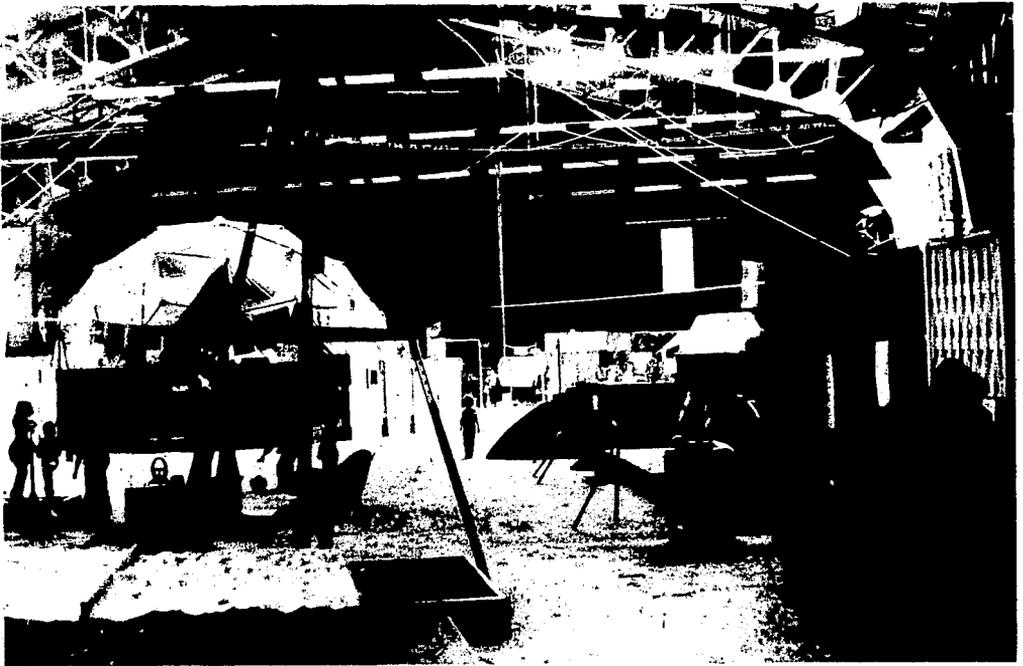
fire stairs. The four levels of the central cube contain exhibit spaces grouped around a central stair. The building was designed to allow for an additional increment of exhibit and classroom space to be added on at a future date.

Operating on an annual budget of \$120,000, the museum also receives the salaries for three curators and the director from the county school board. Of the \$120,000, roughly 40% is provided by the city with the remaining coming from the United Fund, donations, and other private sources.



The Exploratorium

San Francisco, California

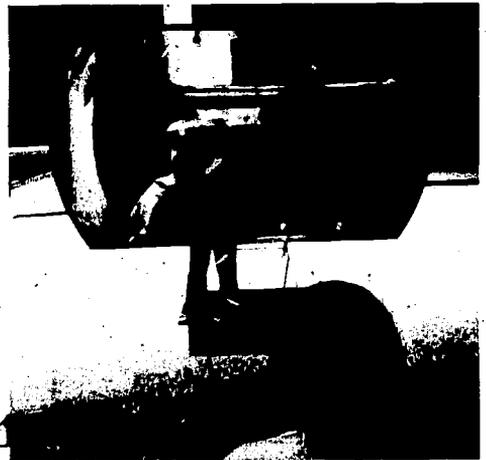


Frank Oppenheimer first became involved with exhibits in the early 1960s when he was a professor of physics at the University of Colorado. There he developed a “library of experiments”—80 different experiments, set out on tables, that students could do at their own pace. A trip to England in 1965 and discussions at several conferences convinced him that there was a need for a science museum that dealt with basic principles. Oppenheimer followed a hunch that San Francisco had the right mix of people and funding sources to nurture the new institution.

Opening in 1968, the Exploratorium was indeed a unique creation. With a grant from the San Francisco Foundation and a lease from the S.F. Department of Recreation on a renovated exhibit hall, the Exploratorium started with several exhibits using material furnished by HEW and NASA. The exhibit hall was a beaux arts confection created by Bernard Maybeck for the 1915 Panama-Pacific Exposition located in a park-like setting close to the Golden Gate Bridge.

Since the 1968 opening, the Exploratorium has developed over 200 exhibits,

each dealing with an aspect of perception. By focusing on the specific topic of perception, the exhibits achieve an overlap that Oppenheimer believes is necessary to convey the essence of basic principles. The focus on perception is also most appropriate for an interactive exhibit environment; visitors are manipulating demonstrations that increase their understanding of their own senses. Light, sound, color, the physiological mechanisms of the eye, and the brain's response to perceptual stimuli are all covered in exhibits that have evolved in response to visitor reactions.



For those visitors who want additional information, red jacketed Explainers are scattered around the hall. These Explainers are high school students recruited through job counselors of the San Francisco Public School system. They receive credits and \$2.10 an hour. Every four months, 18 new Explainers are recruited and trained, then put out on the floor to demonstrate exhibits and answer questions. And, of course, as the Explainers explain, they also learn.

In addition to school tours of the exhibit hall, a program called the School in the Exploratorium brings fourth, fifth, and sixth graders to the building for either five all-day sessions once a week or eight 2-hour sessions once a week. College students trained at the Exploratorium lead the sessions using the museum's exhibits to teach a course about light and sound. The children work in groups of under 15 per leader and make some of their own exhibits; they might dissect a pig's eye, make an ear harp they can take home, and have plenty of time to explore other exhibits.

The physical setting for the exhibits is simple, no frills added. But the sheer size of the space with its steel trusses spanning over 100 ft makes it impressive. To the right of the entrance is the museum workshop space with its lathes and power tools. Visitors often lean on the low barrier that separates it from the exhibits and watch the craftsmen at work. Director Frank Oppenheimer and his staff work out of two trailers located in the midst of the exhibits. Unlike other museums, this exhibit workshop becomes an exhibit itself. The workshop is not

treated as a behind-the-scenes activity; it is brought out front, thus making explicit that the exhibits are always in a state of change.

The big, simple space with its asphalt floor and concrete walls has been an appropriate space for the Exploratorium with its informal, participatory exhibits. Although Oppenheimer would like better toilet facilities, some bright colors, and classroom space, all of the available funding has gone into exhibits and related programs. The city has provided only a small amount of the funding; the bulk has come from foundations, corporations, private contributions, the National Science Foundation, and the National Endowments for the Arts and Humanities.



The Oregon Museum of Science and Industry (OMSI)

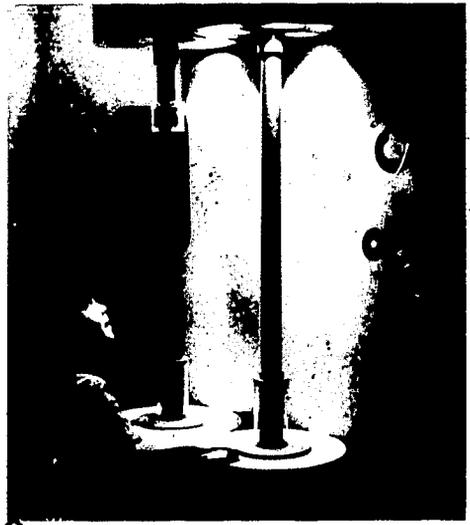
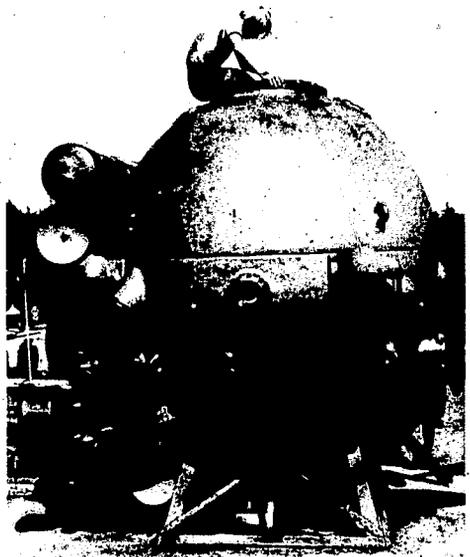
Portland, Oregon

Although its legal name is the Oregon Museum of Science and Industry, it prefers to be known simply as OMSI. The staff feels that calling OMSI a museum is inappropriate at this point; when pressed, they prefer to describe OMSI as a science education center. And that does seem to be a better definition.

Beginning after the war as a natural history museum housed in temporary quarters, the museum suddenly expanded in the late 1950s in response to a renewed interest in science education due to the first Sputnik. The museum obtained a \$1 per year lease from the city for a site in Hunter Park—an estate left to the city for educational, cultural, and recreational purposes. OMSI has since been joined by the Portland zoo and a National Forestry Association exhibit center. OMSI obtained private support from thousands of individuals for the new building. Local labor unions donated labor, and businessmen donated materials. OMSI ended up with a building worth \$650,000 and a mortgage for just \$50,000. This kind of local support has allowed OMSI to remain independent of public funding for its operation.

OMSI is unique among museums in the emphasis that it places on field trips as part of its educational program. The field trips became part of OMSI's program when a local high school teacher proposed a series of field trips to explore the variety of environments that make up Oregon. Since then, OMSI's camping and field trip program has expanded to include four summer camps, and a year-round research center, Camp Hancock. A full-time staff member is based at the camp in the eastern desert region of the state. Student research teams, teacher workshops, and individual researchers work out of the camp studying paleontology, geology, and botany.

Equally innovative is OMSI's Community Research Center, initiated in 1967. The center was an outgrowth of local science fair sponsored by



OMSI. Realizing that high school students are capable of doing meaningful research, the OMSI staff planned a facility that would allow a select number of high school students to do individual research projects. The center became a reality when the Hill Foundation provided the funds necessary to include space in the Hunter Park complex. Since then, students have issued project reports ranging from "A Preliminary Report on Deficiencies of the Element Selenium in the Diets of White Rats" to "A Study in Computer-Composed Music." Working with the center's computer, a group of students interested in computer programming set up a nonprofit corporation, The Software-Development Group, and have marketed their own programs to over 300 computer facilities here and abroad.

In addition, OMSI has many of the programs found in other museums—a kindergarten at the museum, a planetarium, and a variety of exhibit halls. Recent additions to the exhibits include a hall devoted to demonstrations of fluid mechanics and a hall presenting the basic principles of electricity. Classrooms in the building allow OMSI to operate a variety of seminars and workshops in response to local interests.

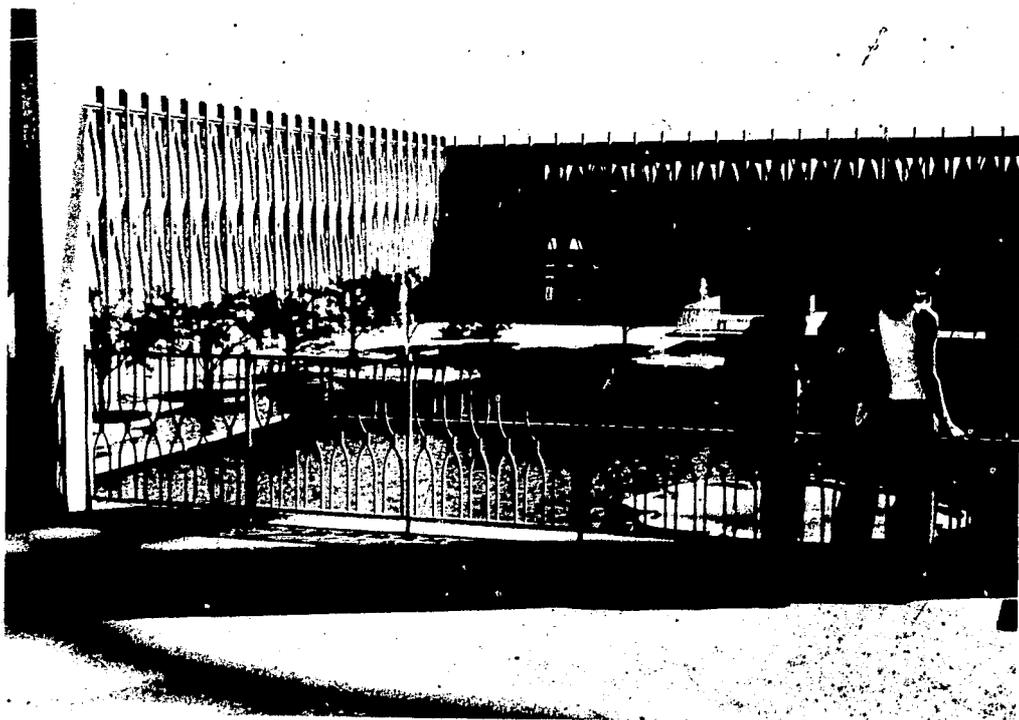
While OMSI operates an extensive school program, it is manned by volunteers who schedule and guide class groups through OMSI. OMSI

prefers not to contract with the local school system for museum programs that fit into the school curriculum. Instead, OMSI bases its support on private donations and the receipts from the annual OMSI auction that brings in over \$150,000. The staff feels that this community support is the best test of whether the museum is providing an effective service. This policy, in turn, allows OMSI to initiate new programs without any bureaucratic red tape.



The Pacific Science Center

Seattle, Washington



Before the Seattle World's Fair of 1962 was over, a group of Seattle's civic leaders proposed that the U.S. Science Pavilion become a permanent community institution—the Pacific Science Center. With the help of their congressional delegation, the group convinced GSA to lease the building for a nominal amount to the new nonprofit corporation. The architect of the pavilion, Minoru Yamasaki, also encouraged GSA to use the pavilion for an exhibit center, rather than holding it for federal use.

With over 50,000 sq ft of exhibit space in six interlocked structures, the Pacific Science Center bypassed the typical museum's growth process.

No temporary quarters in a warehouse for the Pacific Science Center. Not only did the center start with a multi-million dollar exhibit building, but it began with a sophisticated set of exhibits left over from the World's Fair.

For its first three years of operation, the Science Center operated with the existing exhibits and planned new programs. By 1966, the center had renovated one of the structures to become the Regional Mathematics Learning Center, funded by the Sloan

Foundation and the Carnegie Corporation of New York. The learning center contained not only exhibits but also a classroom, library, office, and workshop. These facilities were designed to provide visiting classes with an in-depth experience of mathematics, as well as giving visitors access to additional information. Many of the exhibits used in the math learning center came from IBM's "Mathematica," designed by Charles Eames and first exhibited at the New York World's Fair. The math learning center encourages visitor participation; there are sand pendulums to try out, computer games, mathematical puzzles, and soap bubble demonstrations.

Other changes have occurred since 1962. One building now houses a comprehensive exhibit on aerospace technology and the moon missions. Another building now contains a series of exhibits dealing with the life sciences. Here an Indian Ceremonial House contains Indian artifacts while other exhibits deal with man and the environment.

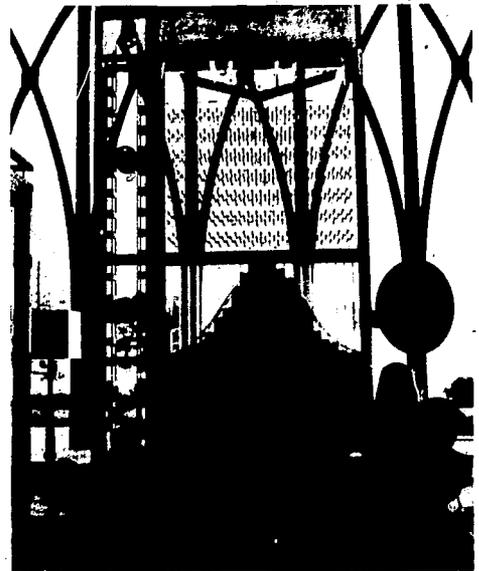
All of these new programs support the staff's conception of the center as being essentially an educational fa-

cility. In 1968 the center began offering teacher workshops in mathematics education; participants receive credit from the University of Washington and Western Washington State College. In 1970, a teaching intern program was initiated that featured graduate students working with visiting classes for credit.

The Pacific Science Center also receives support from the state's Department of Public Instruction, the county school district, and the city of Seattle.

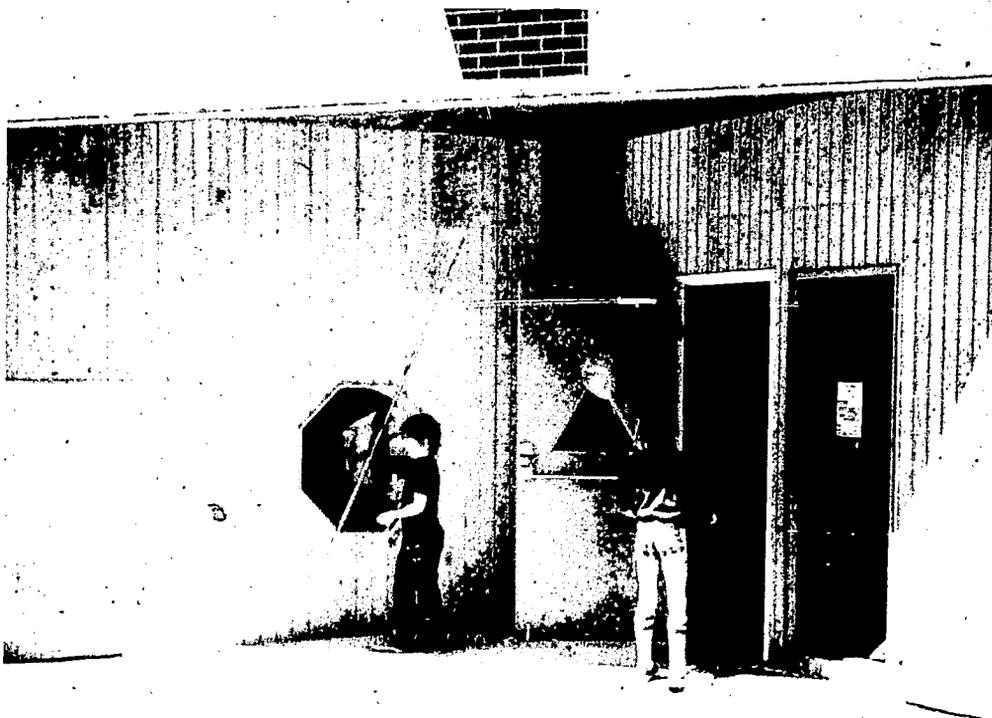
After a series of discussions in 1974, GSA gave the exhibition building to the Pacific Science Center Foundation. Since the buildings and grounds now belong to a private entity, the city cannot legally continue to maintain

the exterior spaces. The foundation hopes to give the surrounding grounds to the city so that the city can continue to maintain them.



A Museum for Children

Denver, Colorado



Opened early in 1975, A Museum For Children inhabits one of three dairy buildings located in the "Golden Triangle" area just south of Denver's business district. The museum leased 10,000 sq ft on the ground level of the brick structure. The renovation was designed by a local architectural firm, ABR Associates, and completed in three months at a cost of \$17,000. The facilities now include an exhibit hall, commons room, workshops, recycled materials center, storage, and rest-rooms. School groups quickly booked up visiting hours for the spring, and visitor reaction seems to be enthusiastic.

But the real story of A Museum For Children concerns the process that brought the group from incorporation to operating the new museum in less than two years. The germ of the idea goes back to December, 1972 when Cynthia and Ed Kahn visited the Boston Children's Museum and thoroughly enjoyed it with their young children. Upon their return to Denver, Cyndi Kahn discussed the possibility of children's museum with a wide

range of people. In March of 1973, a group of interested people began meeting and established a base of support ranging from Congresswoman Pat Schroeder to the major museums in Denver.

During this initial planning phase, it was suggested that the group contact the regional HEW office of child development. This contact sparked the group to incorporate, plan a phase one program, and submit a proposal to the HEW office. By the middle of June, 1973, A Museum For Children had received a grant from HEW "to test the feasibility of developing a public cultural institution primarily for children," as the proposal put it.

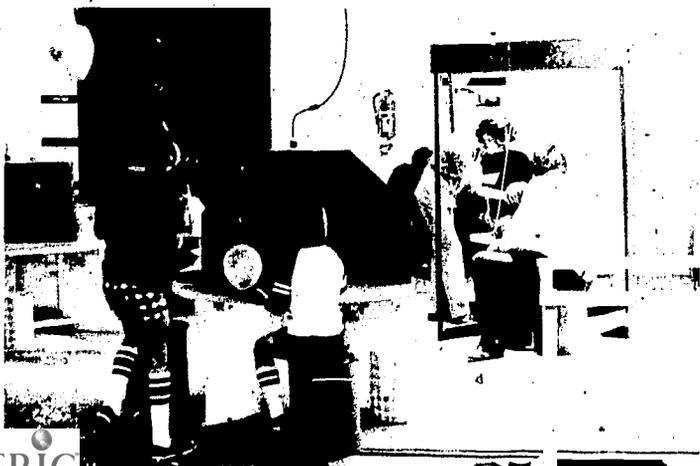
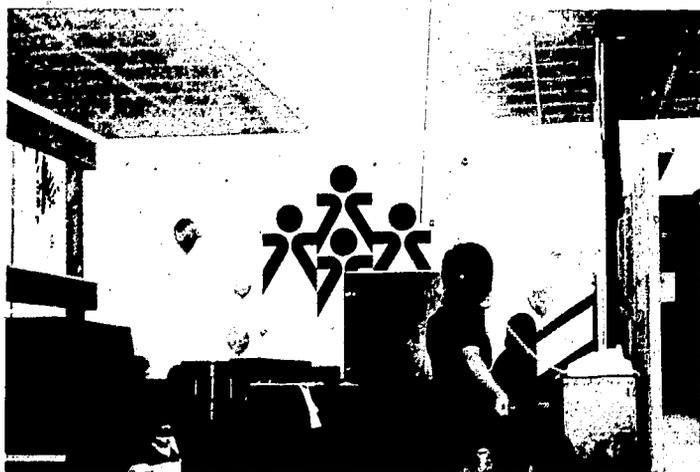
With these funds, the group designed and constructed a series of hands-on exhibits that were taken to eight metropolitan locations in the summer of 1973. Besides providing an educational experience for children, this program tested out the group's exhibit concepts and established a metropolitan base of support for the museum. The response was enthusiastic as the exhibits moved to shopping centers,

libraries, and community centers. The exhibits included portable video-tape units, soap bubbles, crystal growing, and a mini-planetarium.

The HEW grant was renewed for a second year during which the group moved into phase two of their development plan—the housing of the museum in a temporary facility. During this second year, a number of tasks were undertaken: workshops were held for the Central Colorado Library Association, a full-time director was

appointed, and the present building was located.

To date, A Museum For Children has been uniquely successful in obtaining federal support for its program. Eventually, the staff expects support to come from the city, county, and local school systems. The museum's goal is to serve all segments of the community—rich, poor, anglo, chicano, and black. At present the museum charges no admission and memberships are by time contributed, not money.



The Children's Museum of Indianapolis

Indianapolis, Indiana



The Children's Museum of Indianapolis is currently completing the construction of the largest museum for children in the world. With a gross square footage of close to 200,000, the new museum will cluster eight exhibit galleries on five levels around a central circulation core. Exhibits will include a special area for preschoolers, the Indiana fire-fighting gallery, physical science demonstrations, and the Reuben Wells—an 1868 locomotive. A natural history gallery and arboretum will flank the main entrance and there will be gallery space for traveling and temporary exhibitions.

Standing next to the construction site near downtown Indianapolis is the present Children's Museum, housed in a vaguely commercial structure with a few additions. The museum was

started in 1925 when a group of teachers recognized the value of objects to augment the standard school curriculum. Located first in a barn, then a park shelter house, the museum finally arrived at its present location in the early 1940s. Over the years, a series of modifications and additions were made but in 1964 the board of trustees decided to halt expansion until a long range plan could be developed.

Halting the expansion of the museum proved to be more difficult than originally thought. The Reuben Wells, an historic locomotive, was presented to the museum and necessitated the construction of a pole barn tacked on to the back of the existing complex. It wasn't until 1972 that the board completed their long range planning and

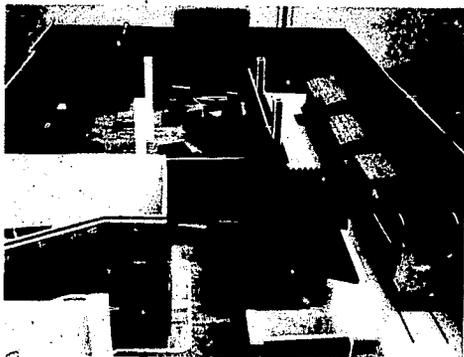
concluded that a new building designed from scratch was necessary.

The physical needs for the new building were developed prior to 1972 over a period of 18 months. A retired industrial engineer worked with the staff to determine what the facility requirements were for each department. The new building contains exhibit galleries, a 360-seat children's theater, a library, a TV studio, an education department, and the necessary administrative and workshop facilities. The resulting program called for a building of 200,000 sq ft at an estimated cost of \$4.5 million. In addition, \$1 million was budgeted for new exhibits and \$1.5 million was to be added to the endowment to cover the increased operating expenses. The actual construction costs of the new building is \$32 per sq ft, slightly higher than the estimates.

With the total budget for the project coming to \$7 million, the trustees decided to hire consultants to do a feasibility study to determine whether the museum could raise sufficient funds to carry out the project. The fund raising was proved feasible when the Lilly Foundation offered a \$3.5 million matching grant for the construction of the new building.

The operating expenses of the museum are covered by a variety of funding sources: the local school systems, grants from the city, memberships,

and foundation grants. As the museum moves from its present 18,000 sq ft of exhibit space to over 80,000 sq ft of exhibit space in the new building, the museum is predicting that it will be receiving more than 500,000 visitors by 1990.



The Boston Children's Museum

Boston, Massachusetts



Located in two large houses and a 7,400 sq ft exhibit space, the Boston Children's Museum is entering its seventh decade beside Jamaica Pond in an older suburb of Boston. During the last decade under the direction of Michael Spock, the museum has established itself as a center for innovative programming. The most visible achievement of this decade of development is the renovation of an existing auditorium into a lively, multi-leveled exhibit space. Designed by a Boston architectural firm, the Cambridge Seven, the colorful space has a non-institutional scale that encourages children to enjoy themselves and get involved in the exhibits.

The museum got its start in 1913 when the Science Teacher's Bureau decided to create an educational center for the exchange of ideas and materials relevant to teaching. The museum expanded and pioneered an exhibit loan program for local schools. However, when Michael Spock became director in 1962, the museum was facing serious financial problems. After a series of meetings in 1963, the staff and trustees decided to focus on the creation of an innovative exhibit environment and to expand the museum's services to teachers.

Grantsmanship played a key part in achieving these objectives. The U. S. Office of Education funded a four-year effort, the MATCH Box Project, that produced a series of social studies kits

for classroom use. At a cost of \$460,000, the kits were designed and produced by the museum staff. *Medieval People*, a typical MATCH Box, contains costumes, tape cassettes, quill pens, coins, barley seed, a psalter, filmstrips, books, and much more.

In 1967, the Workshop of Things opened to acquaint teachers with techniques for stimulating classroom learning through the use of real materials. In 1969, a grant of \$100,000 from the Carnegie Foundation assisted in the expansion of the Workshop of Things to become the present Re-



source Center with its learning materials, teacher workshops, and loan collection. A particularly successful feature of the Resource Center is RECYCLE, a self-supporting operation that collects industrial materials for reuse in the classroom. Industrial scraps, by-products, mistakes, and overruns are collected by RECYCLE and sold at a nominal price at the museum.

Beginning in 1969, the museum has developed a Community Services Division that has supported children's educational programs in more than 150 community agencies in the Boston area. Three challenge grants, totaling \$115,000, have been provided by the Wider Availability of Museums Program of the National Endowment for the Arts. Recent activities have included the design of "Citygames," a book of activities for exploring Boston, and an ethnic discovery handbook for communities under contract to the Office of Education. Because of funding problems for the teacher workshops in the Resource Center in 1975, the workshops were consolidated into the Community Services program.

Inevitably, the museum has concluded that it needs a new facility with a center city location. Program development and a search for a site began in 1973. As programmed, the new museum center will have almost 70,000 sq ft, compared with the 30,000 sq ft in the present location. The exhibit space will be broken into three multi-leveled areas, thus keeping the same scale as the present exhibit center. A browsing/reference area will be next to the exhibit spaces with staff members available to assist the visitor who wishes to explore a topic in more depth. The new center will also include expanded workshop areas, offices, collection stacks, an auditorium, RECYCLE, a children's shop, and a teacher's shop. Also being considered for inclusion are a cafeteria and outside play space. A fund-raising feasibility study has revealed that the program for the new center must be cut back. However, a number of existing buildings are being evaluated as possibilities for renovation into a new center and the program is being revised. Also, the museum is studying whether to sell the existing facility or operate it as a satellite center.



The Charlotte Nature Museum

Charlotte, North Carolina



Initiated in 1947 with the support of the Junior League, the Charlotte Children's Nature Museum was first located in a frame house rented for \$1 per year from the city's Park and Recreation Commission. Laura Owens, a biology teacher who had rallied support for the museum, became its first director. She established a hands-on policy concerning the exhibits, initiated field trips, clubs, and discussion groups.

The museum moved in 1951 to its present site on 31 wooded acres within the city limits of Charlotte. The site was donated by the local Lions Club, and the Park and Recreation Commission agreed to provide half of the operating budget of the enlarged museum. The Junior League raised much of the money necessary for the 7,000 sq ft new building.

Since then, the museum has gradually added both its facilities and its

programs. School groups have booked the museum to capacity, year after year. With an increasing number of adult programs, the "Children's" was dropped from the museum's name in 1966. The expansion of facilities includes a 75-seat planetarium added in 1964, and a health-science wing with exhibits on the functions of the human body.

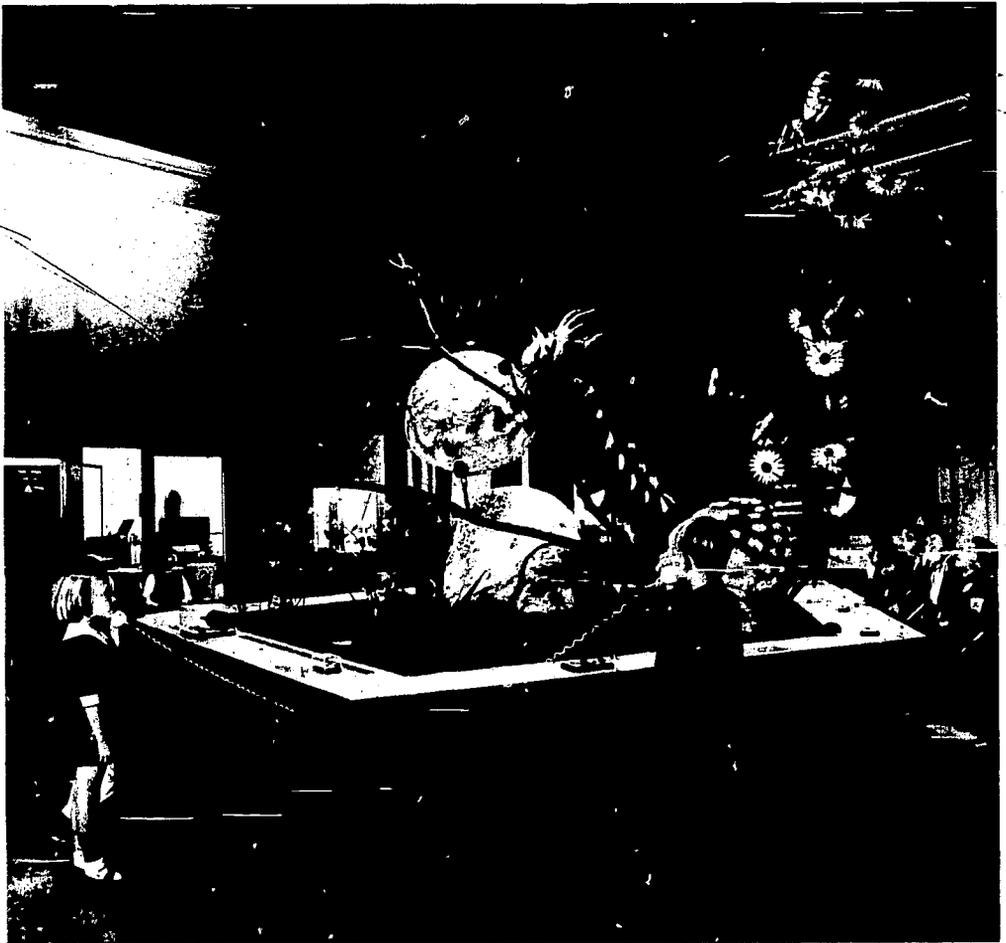
The museum has developed a close working relationship with the city-county school system. The system assigns two school coordinators to the museum and utilizes the museum as an integral part of its earth science curriculum. Thus, 20,000 students a year are visiting the museum and planetarium to learn about the earth in relation to the solar system and universe. In 1974, all ninth graders in the school system began to be booked into the health exhibits as an extension of the school curriculum.

In response to Charlotte's Bicentennial in 1971, the museum opened an exhibit center that presents an automated 15-minute show using three-dimensional dioramas on the 200-year history of Charlotte. The 2,300 sq ft facility is open for both school groups and the general public. Funding for the exhibit and building was provided by the Charlotte-Mecklenberg Bicentennial Commission.

In 1969, the museum put an Environmental Mobile Unit on the road taking programs to disadvantaged children at neighborhood centers throughout the county. The unit, staffed by local college students, presents puppet shows,

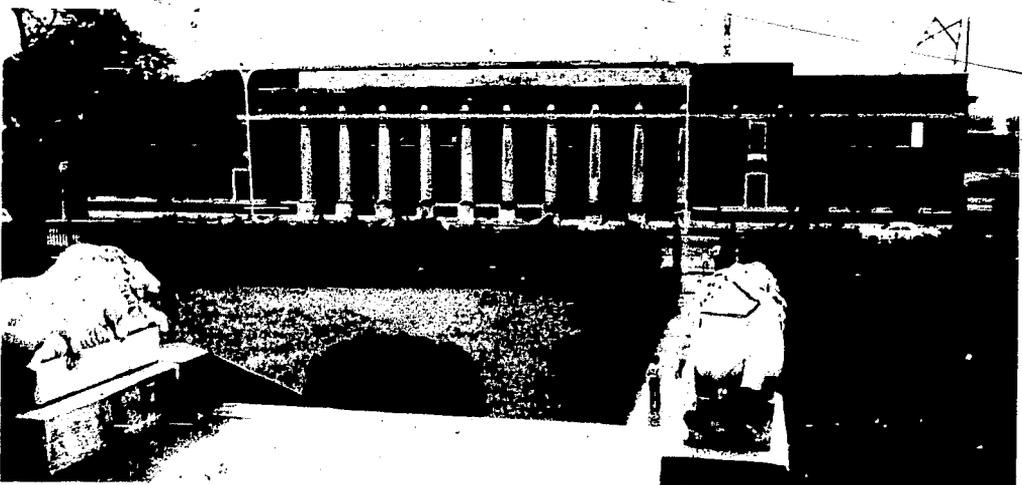
films, live animals, and an African heritage program. The U. S. Department of Labor funded the program through 1973, but in 1974 the program was operated on \$4,000 provided by local sources. The Department of Labor was no longer able to make funds available under its programs.

The museum's current director, Russell Peithman, foresees an expansion of the museum's teacher workshops and services to the school system. In addition, plans are underway for a new museum on a downtown site stressing science and technology, and a 200-acre nature preserve and wilderness area 10 miles from Charlotte.



The Louisiana Arts and Science Center

Baton Rouge, Louisiana



The Louisiana Arts and Science Center has grown through a series of facilities like any healthy youngster outgrowing his jeans. The center began with a doll collection in the basement of the old State Capitol in 1955 and is now undertaking a \$1.5 million renovation of the Illinois Central railroad station for an exhibit center. During this time the museum has become a key cultural facility for Baton Rouge and the surrounding rural area. It is not unusual for a school group to arrive from an isolated rural school 120 miles away and tour the planetarium, the exhibit of contemporary art, and the other collections. Thus, the center provides a rich experience for visitors in a variety of areas: history, science, art, popular culture. any, it's their first museum



experience; as such, it has a real potential for changing a visitor's understanding of the world he lives in.

Like many local museums, the Louisiana Arts and Science Center was initiated by the Junior League. Manned by volunteers, the center got underway in 1955 located in the basement of the old State Capitol. The space had been provided informally by the state to allow the museum to get started. But it was agreed by all that these three rooms in the basement could only be used temporarily. Volunteers used the doll collections as props to describe the history of Louisiana to schoolchildren.

The program was an instant success; the center quickly reached a point where more space was desperately needed. As it was to do several times, the museum decided to solicit funds for a bold expansion. Word had been spread that the state government was going to sell the old governor's mansion for \$300,000. A local attorney who believed in the museum cajoled 248 people into pledging a hundred dollars a year for five years. Although this was not enough to purchase the mansion, the group was not stopped. They convinced the state legislators to give them the building and they used the money collected to renovate the structure.

The center has been a successful fund raiser and has developed a strong program with the local school systems. A Title III grant of \$85,000 supported an innovative program that sent liaison teachers out to rural schools to prepare classes for a visit to the center. After the federal funds ran out, the city-parish (equivalent to a county) took over the program funding and chipped in 50 cents per pupil yielding \$33,000 per year. A new planetarium has been added to the governor's mansion financed by a \$400,000 loan from the city with the money being raised through a municipal bond issue.

To plan their expansion, the center hired the Gulf South Research Institute in the mid-1960s out of Title III funds. The resulting report found the governor's mansion to be inadequate and suggested new exhibits with the Mississippi as a theme. In the early 1970s the search for a new building

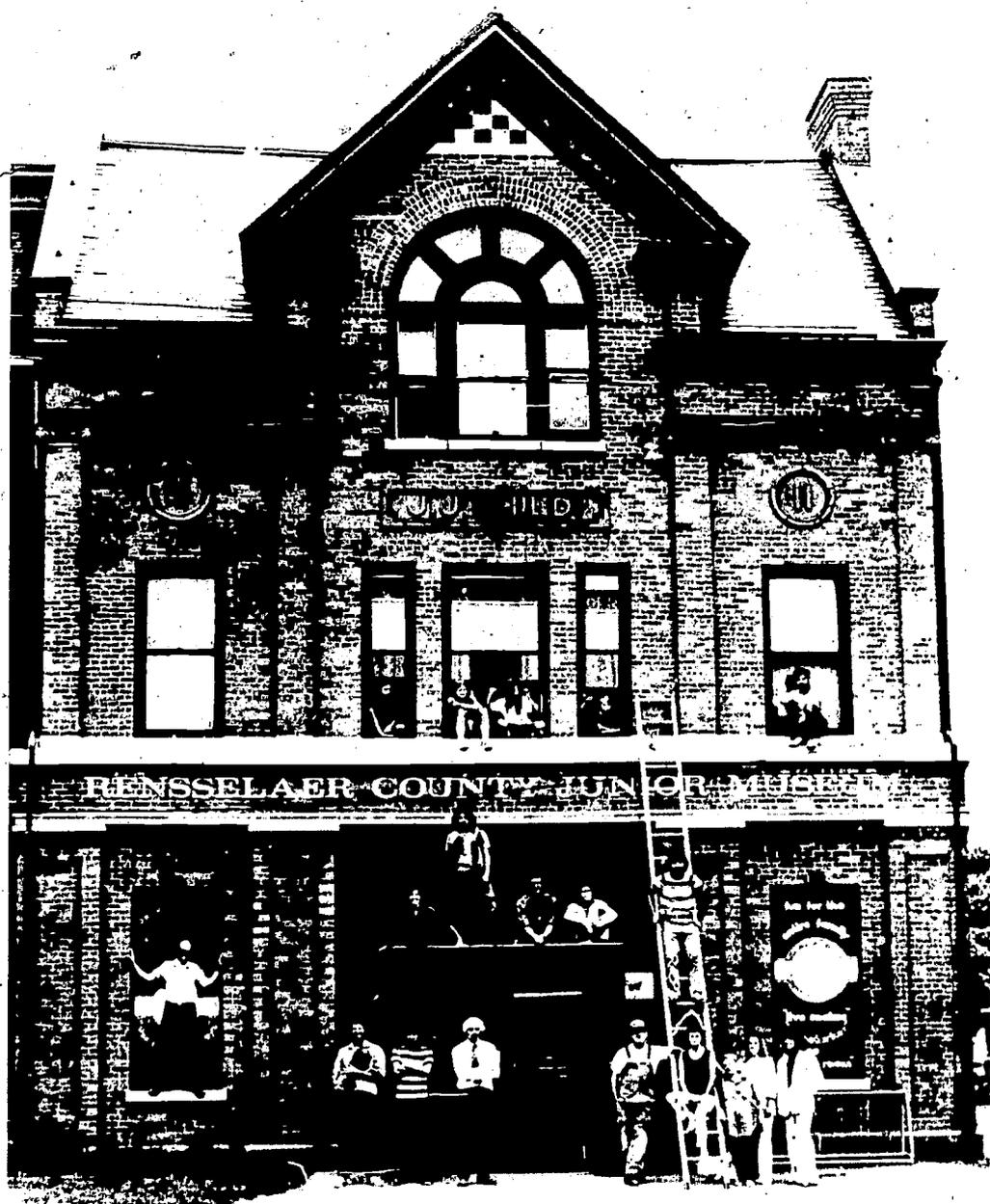
Illinois Central built in 1925. The museum received a 35-year lease from the Illinois Central and \$1.5 million from the city to renovate the building. Located next to the Mississippi, the station will include a river-oriented exhibit, and it will become part of a new civic center funded by Urban Renewal funds.

The key to the center's success has been its forthright admission that Baton Rouge may be out of the mainstream, but it is unique and it can provide vital cultural experiences for the surrounding rural area. And the fact that the center has supporters who aren't afraid to badger friends for money and support hasn't hurt.



Rensselaer County Junior Museum

Troy, New York



This junior museum was established two decades ago by Troy's Junior League in the basement of the County Historical Society. Outgrowing that space, and ready to support full-time staff, it moved in 1960 to a gingerbread Victorian house on an ample city lot in the north end of Troy. Volunteers and a minimum of paid labor, scrubbed, repaired and painted the house, developed gallery and exhibit areas, built a greenhouse, restored the grounds and planted an herb garden, and equipped a modest plane-

tarium, and refurbished the small barn. All this work resulted in a stimulating place for young clients who came by foot and yellow school buses that pulled into the front drive.

The place quickly became a day long, week long center with scheduled school classes during the day, special programs and activities in the afternoons and on the weekends, and periodic special events and exhibits that brought in parents and townspeople to enrich the mix.

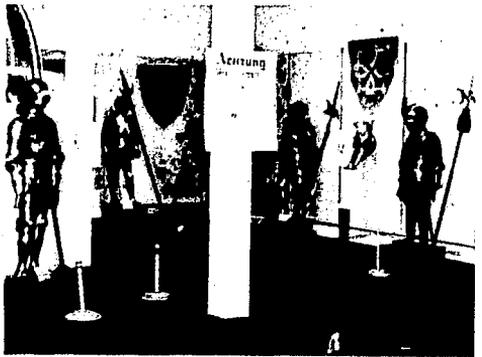
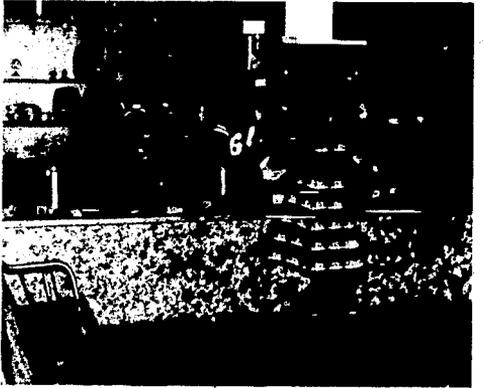
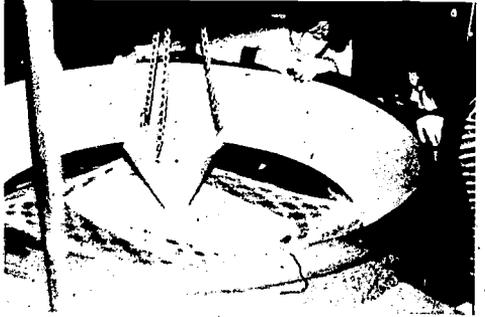
Not satisfied that this should be only a place to come to, the museum began a variety of outreach activities which more than doubled the youth it reached. Portable exhibits and kits of materials, together with a docent go out to schools on a scheduled basis. But other forms of outreach activities were developed as well. For instance, one summer a group of students excavated a Revolutionary War period "glass house" in a farmer's field 15 miles away from the museum itself.

By 1973 it was time to move again, this time to the about-to-be abandoned, but well-constructed and handsome, 1904 firehouse. The museum paid \$8,200 for the property which provided more space, especially large areas allowing for a major expansion of programs and exhibits, better access to public transportation, and the opportunity to demonstrate adaptive use of significant local buildings. An additional \$73,000 went into the conversion which involved the architectural services of a community design center. In addition, some of the labor costs were covered by a college work study program with nearby Rensselaer Polytechnic Institute.

It's expected that in 1976, about 10,000 persons will come through the front door for classes, exhibits and special programs, and an additional 15,000 students will be reached at their schools.

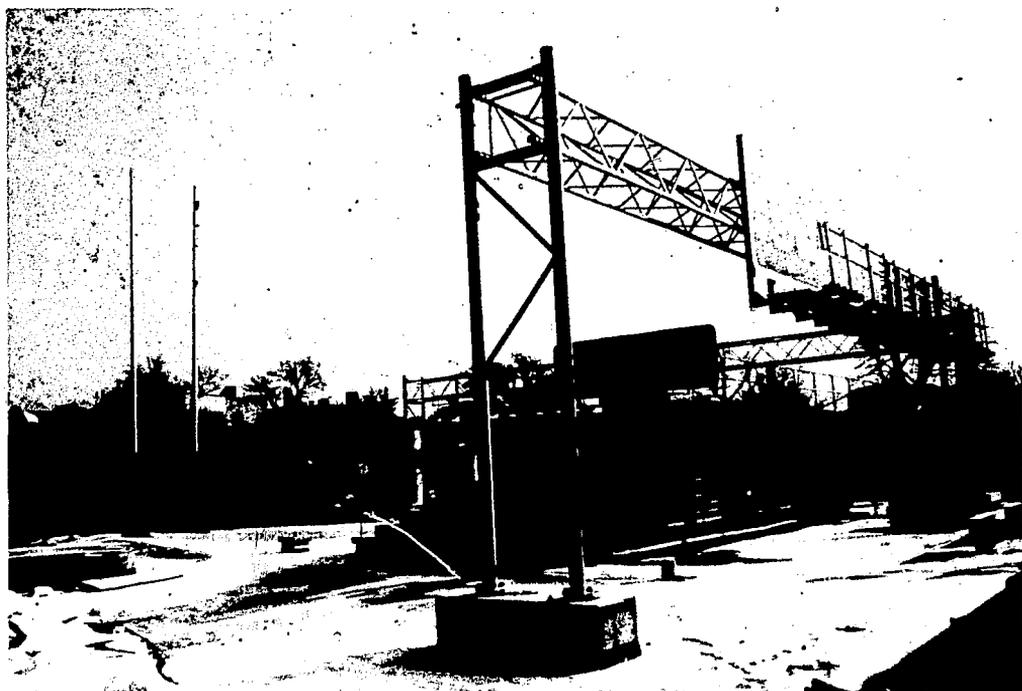
So, two decades later for Rensselaer County the idea of manipulative exhibits and unique museum experiences for youth is more powerful than ever, and in the process of providing shelter for itself, the museum has demonstrated that such institutions can be a force in community renewal.

Todd Pulliam, director, makes an important observation. He feels that the purpose, program, and image of youth museums may limit too severely the constituency they reach, especially in smaller communities. For instance, the place and what it offers must be dejuvenilized if it is to attract high school students for serious study. In other words, a youth museum, which is based on manipulative, experience-oriented exhibits and programs, may be the right solution for communities that would be better with a museum for all persons.



The Brooklyn Children's Museum and MUSE

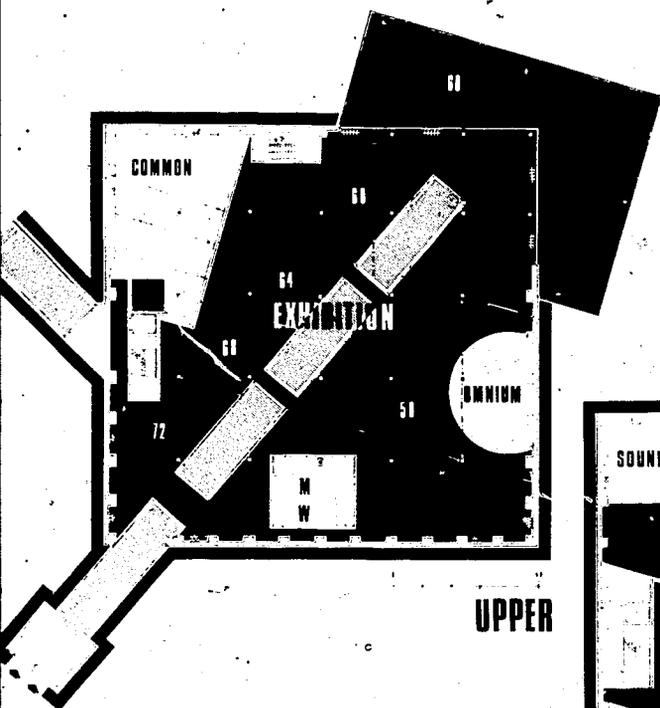
Brooklyn, New York



In a sense, the Brooklyn Children's Museum has had no alternative but to be innovative during the last decade. Begun in 1899 as the country's first children's museum, it had come to inhabit two old mansions in Brooklyn's Brower Park. However, by the 1960s the mansions had deteriorated to the point where they were declared

hazards and were razed by the city

Although the museum's parent agency, the Brooklyn Institute of Arts and Sciences, had promised a new facility in Brower Park, a number of years would be needed for the new museum's design and construction. The interim solution was MUSE, a former automobile showroom renovated to serve as a community museum. On a bare bones \$40,000 budget, Hardy Holzman Pfeiffer Asso-



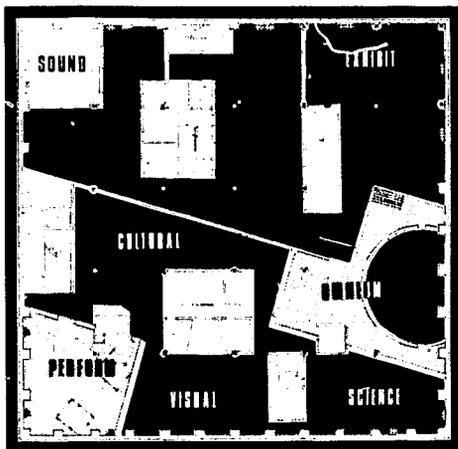
UPPER

ciates designed a renovation that transformed the existing building from an eyesore into a delight for the community's children. The entry was down a curving corridor lined with niches for exhibiting model trains and stuffed animals. MUSE had room for animals, cultural exhibits, a mini-planetaryarium, workshop space, and offices in its 12,000 sq ft. The interior lighting and graphics were eye catching while the exterior had MUSE splashed across it in bold letters.

The eccentricity of MUSE's interior spaces might put off some adults used to their museums being pristine boxes. Here, the architects delight in the clash of forms that occurs when the interior spaces are skewed in relation to the edges of their container. A variety of residual spaces are generated; the building comes to have its own unique topography that invites exploration. In short, kids love it.

Despite the red tape, Brooklyn will open in 1975 a new children's museum, a \$4 million building of over 50,000 gross sq ft. When the exhibit installation is completed in late 1975, the visitor will find a museum vastly different from the earlier museum mansions that stood on the same Brower Park site. The new museum is a square block buried and bermed into the earth to minimize its impact on the surrounding park. Also designed by

Holzman Pfeiffer Associates,



LOWER

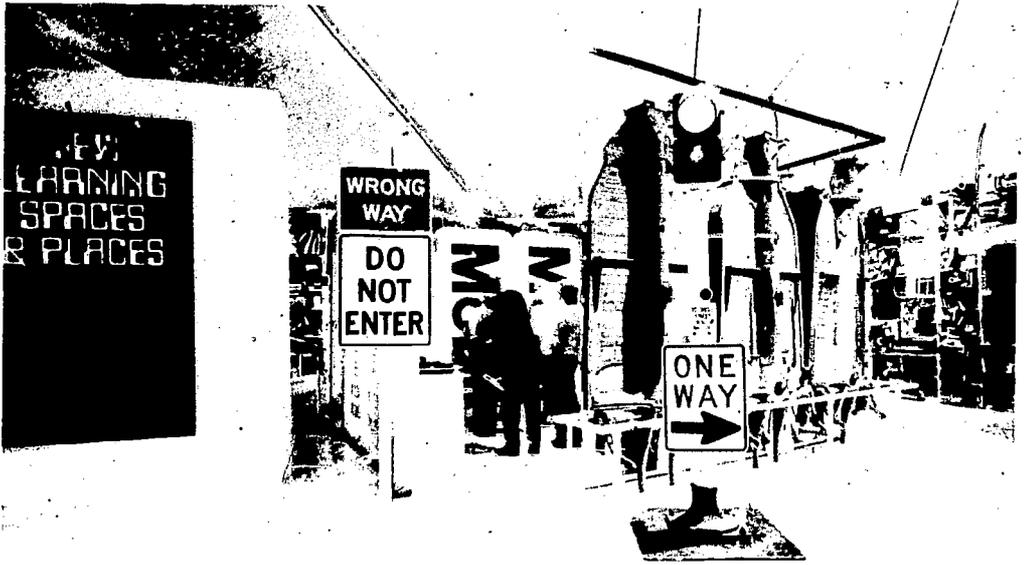
the new building carries on the firm's tradition of skewing the interior forms and spaces in relation to the exterior walls.

And the new museum exhibits the same interest in found objects that has characterized other designs of the firm. A 19th century streetcar kiosk from the Queensborough Bridge becomes the main entry point while a rooftop performance area is fashioned out of contemporary Americana—expressway signs, high school bleachers, and a steel storage tank. This design approach seems particularly appropriate for a children's museum with an experience-oriented approach; the architects transform the visitor's perception of everyday objects by introducing them in a new context.

That such an innovative design can be done at all may be due to the fact that the museum receives the major part of its funds from the Brooklyn Institute of Arts and Sciences, not from a department of recreation or a school system. Although the museum receives city support, it is funneled through an agency that is concerned with furthering the state-of-the-art.

"New Learning Spaces and Places,"

An Exhibit of the Walker Art Center, Minneapolis, Minnesota

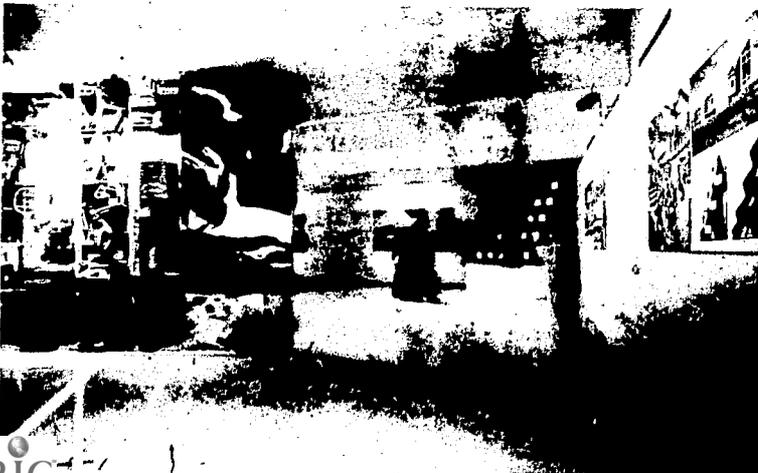


More and more frequently, conventional arts museums are developing special exhibits concerned with education or appealing especially to youth. For instance, for six weeks in early 1974, Minneapolis had a learning center second to none for sheer excitement and joy. Over 60,000 people toured the exhibits and reacted enthusiastically. But at the end of the six weeks, the center was dismantled and the exhibits were dispersed.

What happened? Nothing unplanned. The "learning center" was actually an exhibit, "New Learning Spaces and Places," at the Walker Art Center.

Designed by the New York architectural firm of Hardy Holzman Pfeiffer Associates, the exhibit dealt with both the traditional classroom environment and a set of innovative learning experiences. The spine of the exhibition was a wall with niches and shelves containing books, exams, trophies, globes, charts, and other classroom paraphernalia spanning back to the beginning of the century. TV sets were built into the wall as one of the contemporary tools for passively feeding information to students.

Ranged around the walls of the galleries were 15 photomurals of innovative



learning spaces, and quotes on learning from Confucius to Margaret Mead. Nine "experience places" stood in the gallery space, each with a technological device, a "toy" for visitors to interact with. These toys included computer games, videotapes, holograms, and TURTLE—a computerized toy that drew geometric shapes. Located at the end of the exhibit, the "Learning Resources Bank" provided each visitor with a printout of area locations where individual interests could be pursued.

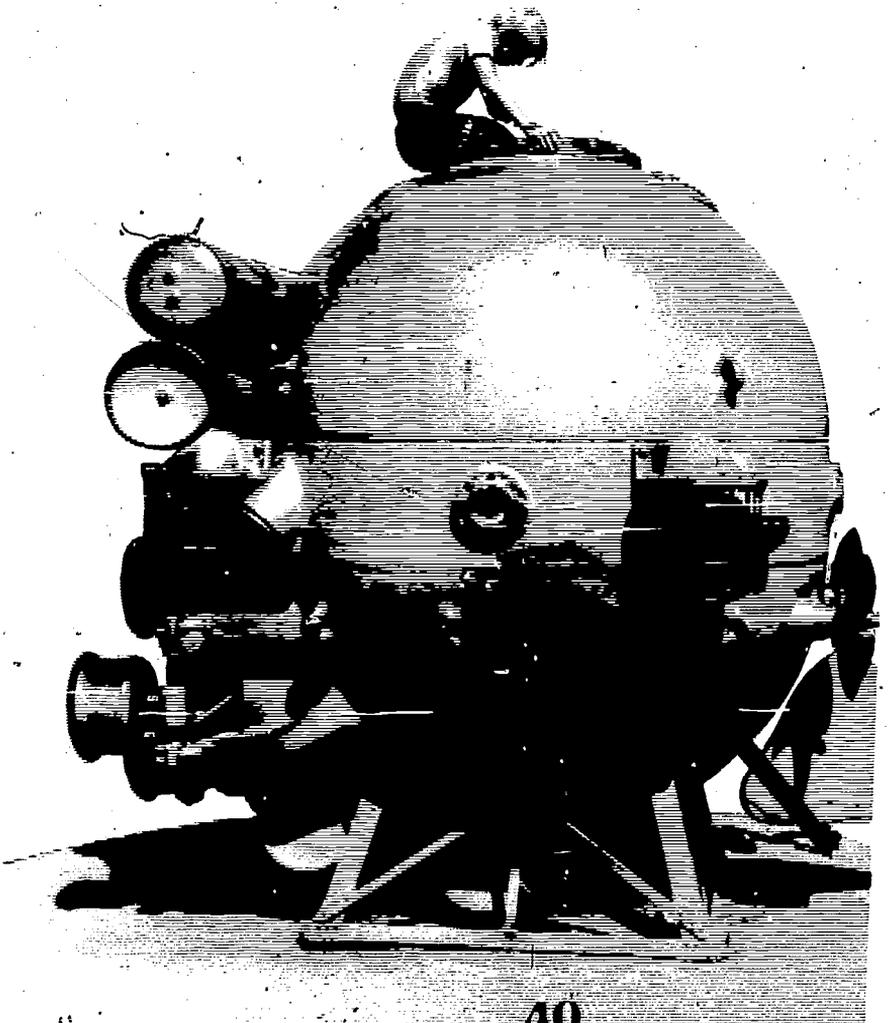
Micki Friedman, editor of *Design Quarterly* published by the Walker Art Center, initially proposed to Hugh Hardy of Hardy Holzman Pfeiffer Associates that the firm design a prototype classroom. But all concerned concluded that a prototype was a meaningless exercise; the objective then became to show a new way of looking at the educational experience. The Minneapolis public school system became part of the effort and contributed a great deal of staff time. In a pioneering effort for the museum, a grant for \$36,000 was secured from

the National Endowment for the Humanities. Previous grants to the museum for exhibits had come, as one might expect, only from the National Endowment for the Arts. The Graham Foundation in Chicago added \$7,500 to the funds for the exhibit, and the center itself supplied the remainder of the \$77,000 budget.

The school system provided a full-time coordinator to manage the exhibit during its six-week life. High school students were given release time from school to act as guides for the exhibit. The exhibit with its sophisticated technology was geared for high school students, unlike most youth museums which have a younger audience. And it succeeded; when plans to circulate the exhibit fell through, the guides were crestfallen. It had become *their* show and they wanted it to continue intact. But much of the expensive hardware had been borrowed from corporations just for the Walker show and there was no way of circulating the exhibit. Despite the excitement generated by the exhibit, the show came down at the end of its six-week run.



CONCLUSIONS



The Institution Itself

In many cases, the style and policy of the museum are due to one person, the director. It is the director who meets with the trustees, raises money, sets exhibit policy, hires the staff, and handles the budget. When the Denver Museum for Children was searching for a director, they let it be known that they needed a qualified person who would be available 24 hours a day, could do janitorial work, and could run minority programs. It's a demanding job.

The director is a full-time professional responsible for making the museum a success, but often there is a long jump down to the next staff person in terms of training, responsibilities, and salary. Museums tend to operate on the enthusiasm of volunteers and an underpaid but dedicated staff. As can be expected, the turnover of staff is usually quite high.

But for a museum to be a success, it needs more than a director. It may have a teacher who enjoys the kind of rapport with kids that makes a preschool program work. It may have an energetic leader of field trips. It may have a designer who can put together experience-oriented exhibits that create a total environment.

But it is rare for a museum to reach that threshold where the director and the staff achieve a synergistic relationship, a relationship in which each person contributes creatively to the group effort. When this occurs, as it has at the Boston Children's Museum and the Exploratorium, the museum can pioneer new techniques across the board. The work of one person provides insights for other people to incorporate in their work. The museum begins attracting people from other disciplines who want to take part in the creative mix. In short, the museum becomes an intellectually and creatively exciting place.

It is easy to attribute this synergy to the museum's location in a Boston or a San Francisco. But OMSI in Portland, Oregon has created a dynamic institution, not by assembling a high powered staff, but by encouraging the participation of gifted people in their

seriously, studied it carefully, and has provided the field trips and equipment necessary for further investigation. It has such a solid base of citizen support that it's not straining to submit grant proposals or plug into existing school curricula. It has established itself as an independent educational facility.

OMSI and a handful of other museums have also continued to strive for museum experiences that are beyond the basics. It is relatively easy to turn a visitor on, to excite the visitor about a particular field of study. But after a kid has played with a computer and become intrigued, what next? The museums all agree that most teachers don't follow through when they return to the classroom, even though the museum provides the necessary materials.

One answer is to provide other levels of participation at the museum for those who become interested in a particular subject. Museums do this with programs ranging from astronomy clubs to computer labs, art workshops to field trips. Unlike the typical school, the participants take part voluntarily, which ensures a certain degree of motivation and curiosity.

But such in-depth experiences can only reach a limited number of people. A technique for achieving greater leverage on the problem was pioneered by the Boston Children's Museum—teaching the teachers. If a group of teachers can be trained to use materials creatively, they will affect the learning of children year after year. Teacher workshops have now become a standard program of experience-oriented museums.

The Museum and its Constituency

Every city has its own unique constellation of cultural institutions. Large cities may have several museums, each specializing in a particular field—modern art, natural history, science and technology, or history. Small cities may have just one museum, usually concerned with art. An experience-oriented museum cannot be categorized neatly, and often finds itself

grouping for a role appropriate to its community. Not wanting to duplicate an existing service; it must find its own constituency.

Experience-oriented museums in large cities—Boston, New York, Denver—can find it appropriate to focus unequivocally on children. Other museums in these cities are concerned with a full range of subjects. But in the smaller cities—Fort Worth, Corpus Christi, Jacksonville—there is great pressure on experience-oriented museums to assume a broader role.

They are often the only local museum concerned with science, technology, or natural history. And these museums find that they can receive more financial support, if they don't label themselves children's museums. Some hold out, others change their name.

Funding Sources

It is axiomatic that each hands-on museum will put together its own unique blend of funding sources. Most of these museums receive a large portion of their budgets from various local public agencies; yet they also depend on volunteers, private contributors, and foundation grants. They maintain a tenuous public-private partnership. As the level of public support increases, it becomes increasingly important that the museum maintain its independence. The Brooklyn Children's Museum has put up with the red tape and managed to maintain a high degree of independence. Aal Heine, director of the Corpus Christi Museum, is increasingly concerned that the city's sponsorship of the museum will limit his ability to develop programs independent of the school system curriculum. The difficulty of this struggle to maintain an independent position varies with the particular institutions of a given city.

But with the single exception of OMSI, all of the hands-on museums surveyed depended on some degree of support from public agencies. Even OMSI, with its fiercely independent posture, leases its site from the city government for \$1 per year. The major funding sources of each museum surveyed are covered in the case studies,

but it is worth noting the range of funding sources:

Museum Revenue This revenue is generated by memberships, attendance, and museum shop sales. Museums with free admission have reduced income in this category.

Contributions Gifts may come from individual donors, corporations, the United Fund, and civic groups. Corporations often donate sophisticated equipment for exhibits dealing with technology.

Fund Raisers The Haunted House fund raiser at Halloween is a staple of most children's museums. The Pacific Science Center has an annual dinner dance in its courtyard. The daddy of them all is OMSI's auction that is now grossing close to \$200,000 annually. These events can produce surprisingly high revenues.

Subsidized Facilities A number of hands-on museums lease their building and/or site for a token amount, \$1 per year. Many city governments have a stock of real estate for which they have not been able to invent a use. The support of civic leaders facilitates getting such city support. In Baton Rouge, La., the museum persuaded the Illinois Central to donate a phased-out railroad station. In Seattle, the federal government leases the world's fair exhibit center to the Pacific Science Center.

Program Fees Various educational programs generate revenue from individual participants as well as school systems. These range from school tours to adult workshops. School systems often establish a level of support based on a per pupil fee. As this report documents, this category of revenue has continued to expand.

Line Item City Government Support This takes the form of a yearly grant from the city to support the operations of the museum. This form of support is particularly susceptible to the vagaries of politics.

Staff Support from School System This is often in the form of a full-time schools coordinator as at Charlotte, Fort Worth, and Corpus Christi. At Jacksonville, four museum staff positions are funded by the school system, including the director.

Parks and Recreation Department Support The Josephine D. Randall Junior Museum in San Francisco is a facility of the Parks and Recreation Department which supplies the operating budget. The Museum of Science and History in Little Rock also receives city funds through the parks department. The "bat and ball" approach of a parks and recreation department toward youth programming does not make for a very productive relationship.

State Support The Pacific Science Center receives support from the Washington State Department of Public Instruction for its operation. The Museum of Science and History in Little Rock is seeking a grant from the state legislature for its environmental education program. State support is particularly relevant to teacher-training programs.

Foundations Local foundations have been of particular assistance to hands-on museums. Check the case studies for more information. Foundations will support specific programs but not museum operating costs.

The Federal Government Title III of the National Education Act provided a grant to the Louisiana Arts and Science Center. The Department of Labor provided grants to the Charlotte Nature Museum through Project SPEAR (Summer Program in Education/Art/Recreation). The Denver Museum for Children received grants from the Office of Child Development in HEW. The Boston Children's Museum has also received a number of grants from the Office of Education. Hands-on museums have also received support from the National Science Foundation, the National Endowments for the Arts and Humanities, and the National Museum Act administered by the Smithsonian Institute.

Facility Implications

As the case studies show, the typical growth process of a hands-on museum has several stages: the old house, the modest structure, a number of additions, then a major structure. But new ones like the Exploratorium, the

Pacific Science Center, and the Denver Museum for Children are bypassing some of these stages. Rather than begin with an old house, they are putting together the resources necessary to modify an existing loft space that can accommodate workshops, exhibit areas, and offices. The renovated building may serve for a five- to ten-year period. During that time, the museum will build its constituency, establish its character, and lay the groundwork for future expansion.

A particularly difficult step for a museum is the decision to give up a facility that has been added on to over a period of years in favor of a new building, often at a new site. A number of museums have taken this step in recent years: the Brooklyn Children's Museum, the Jacksonville Children's Museum, the Indianapolis Children's Museum, the Corpus Christi Museum. A number of others are now planning a new facility.

But creating a new facility does not necessarily mean designing a new building. In Baton Rouge, the Louisiana Arts and Science Center is undertaking the renovation of an Illinois Central railroad station for its new quarters. The Boston Children's Museum is evaluating a number of existing buildings for renovation into a headquarters building. This adaptive use of existing structures often provides the museum with a number of bonus features: large loft spaces suitable for exhibits, materials and workmanship no longer available, and an environment that reflects explicitly the museum's concern for the region's history.

It is relatively easy to establish a program for the new facility simply by expanding the square footages of the existing activities. But this misses the true potential for a new place; inevitably, a new facility means that the institution itself has changed. It is a time for careful examination of the goals of the institution.

Unfortunately, such an examination rarely takes into account the image that the museum wants to project. That image can be imposing, severe, humorous, funky, colorful, or slick. For example, if the desired image is to be humorous and colorful, it might

have graphics splashed across the front of it, as does MUSE in Brooklyn. It might have colorful structures designed to shape exhibit areas, as at the Jacksonville Children's Museum. And in general, a museum that has an imposing, institutional image seems completely inappropriate for a hands-on museum. An appropriate image for a museum doesn't just happen, it must be carefully designed.

The scale of a museum is another design issue that rarely gets addressed frankly. When a museum's constituency consists primarily of children, the design of the museum and its exhibit environment should take the scale of children into account. Repeatedly, museum directors recall with great fondness the sense of intimacy that the old house had when the museum first got started. They assume that the intimate scale of the old house cannot be designed into a multimillion dollar new building.

But an intimate scale can be achieved regardless of the gross square footage. The Boston Children's Museum created a multi-level visitor's center of 7,400 sq ft that has a variety of spaces that encourage exploration. But the center also has a scale that responds to the size of children. Pleased with their present center, the museum plans to achieve a similar scale in their new facility, while adding triple the exhibit space. The designers are achieving this simply by breaking the new exhibit space into multi-leveled modules, each equivalent to the present center.

Another key design decision in designing a hands-on museum involves the zoning of activities. Four distinct activity areas are found in every

museum: the exhibit, service, office, and support areas. Much of the character of the museum depends on the relationships between these activity areas. The Corpus Christi Museum places the office, service, and support areas in a separate zone from the exhibit area. The Exploratorium has all the activities occurring in one zone. The plans for the new facility of the Boston Children's Museum call for a continuum of activities with the exhibits the most accessible and support areas the least accessible.

But even the most thoughtful design means nothing if there is no money to build the new structure. It is difficult for a museum to objectively assess its own capability for raising money. Caught in the yearly struggle to make ends meet, a museum's staff may feel that a multimillion dollar building program is pure pie-in-the-sky.

Museums in Boston and Indianapolis have tackled this problem by hiring consultants to assess the feasibility of raising funds for a given project. In the case of the Boston Children's Museum, this led to the realization that the new building must be a more modest project than originally planned.

To sum up, the hands-on museums surveyed are growing as institutions and expanding their facilities. The quality of this growth depends on a number of variables: leadership, funding sources and awareness of design issues. The museums that grow most productively will be those that perceive themselves as pioneering a new type of institution. This new entity, the experience-oriented museum, seeks to bring people and objects together in such a way that learning occurs.

EFL PUBLICATIONS

The following reports are available from EFL at 850 Third Avenue, New York, N. Y. 10022.

CAMPUS IN TRANSITION

Interprets demographic factors influencing college enrollments, discusses current academic trends, and describes how dozens of colleges are producing new income and/or providing new programs without building new facilities. (1975) \$4.00

CAREER EDUCATION FACILITIES

A programming guide for shared facilities that make one set of spaces or equipment serve several purposes. (1973) \$2.00

COMMUNITY/SCHOOL:

SHARING THE SPACE AND THE ACTION

How schools share facilities with other public agencies to provide improved social services. The book discusses financing, planning, building, staffing, and operating community/schools. (1973) \$4.00

THE ECONOMY OF ENERGY CONSERVATION IN EDUCATIONAL FACILITIES

Recommendations for reducing energy consumption in existing buildings, remodeled projects, and future buildings. Explains the importance of including long-term operating costs and evaluating capital costs of electrical and mechanical systems. (1973) \$2.00

EDUCATIONAL CHANGE AND ARCHITECTURAL CONSEQUENCES

A report on school design that reviews the wide choice of options available for planning new facilities or updating old ones. (1968) \$2.00

ENVIRONMENTAL EDUCATION/FACILITY RESOURCES

Illustrates where and how students learn about the environment by using existing facilities in schools, communities and natural sites. (1971) \$2.00

FEWER PUPILS/SURPLUS SPACE

Looks at the phenomenon of shrinking enrollments, its extent, its possible duration, and some of the strategies being developed to cope with unused school space. (1974) \$4.00

FIVE OPEN PLAN HIGH SCHOOLS

Text, plans, and pictures explain how five secondary schools operate open curriculums in open spaces. (1973) \$3.00

FOUR FABRIC STRUCTURES

Tent-like or air-supported fabric roofs provide large, column-free spaces for physical recreation and student activities at less cost than conventional buildings. (1975) \$3.00

GENERATING REVENUE FROM COLLEGE FACILITIES

Strategies used by institutions of higher education to produce income from their land and buildings. (1974) Single copies free, multiple copies 50 cents each.

THE GREENING OF THE HIGH SCHOOL

Reports on a conference on how to make secondary school healthy. Includes the life-styles of adolescents and ways to accommodate them, open curriculums and alternative education programs. (1973) \$2.00

HIGH SCHOOL: THE PROCESS AND THE PLACE

A "how to feel about it" as well as a "how to do it" book about planning, design, environmental management, and the behavioral and social influences of school space. (1972) \$3.00

LEARNING ABOUT THE BUILT ENVIRONMENT

A sourcebook of guides and resources for teachers, and mini-courses, activities, programs, games, simulations and films for students. Available from the National Association of Elementary School Principals, 1801 North Moore Street, Arlington, Virginia 22209. (1975) \$3.00

ONE OUT OF TEN: SCHOOL PLANNING FOR THE HANDICAPPED

Implications of the new laws for the handicapped, and alternative methods of educating handicapped children in public schools. (1974) Single copies free, multiple copies 50 cents each.

PHYSICAL RECREATION FACILITIES

Illustrated survey of places providing good facilities for physical recreation in schools and colleges - air shelters, roofing existing stadiums, shared facilities and conversions. (1973) \$3.00

THE PLACE OF THE ARTS IN NEW TOWNS

Reports the experiences of arts in new towns and established communities. Gives insights and models for the support and planning of programs and facilities for arts in new towns. (1973) \$3.00

PLACES AND THINGS FOR EXPERIMENTAL SCHOOLS

Reviews every technique known to EFL for improving the quality of school buildings and equipment: Found space, furniture, community use, reach out schools, etc. Lists hundreds of sources. (1972) \$2.00

REUSING RAILROAD STATIONS

Advocates combining commercial and public use of discarded railroad stations to preserve part of our heritage, keep urban centers alive, and provide facilities (including educational) for public services. (1974) \$4.00

REUSING RAILROAD STATIONS: BOOK TWO

Extends the information in the first book, explains the business of development, and describes 30 federal agencies that can give financial aid. (1975) \$4.00

STUDENT HOUSING

A guide to economical ways to provide better housing for students. Illustrates techniques for improvement through administrative changes, remodeling old dorms, new management methods, co-ops and government financing. (1972) \$2.00

Films

The following films are available for rental at \$9.00, or for purchase at \$180.00 from New York University Film Library, 26 Washington Place, New York, N. Y. 10003. Telephone (212) 598-2250.

NEW LEASE ON LEARNING

A 22-minute, 16mm color film about the conversion of "found space" into a learning environment for young children. The space, formerly a synagogue, is now the Brooklyn Block School, one of New York City's few public schools for children aged 3-5.

ROOM TO LEARN

A 22-minute, 16mm color film about The Early Learning Center in Stamford, Connecticut, an open-plan early childhood school with facilities and program reflecting some of the better thinking in this field.

THE CITY: AN ENVIRONMENTAL CLASSROOM

A 28-minute, 16mm color film, produced by EFL in cooperation with the New York City Board of Education, shows facilities and resources in and around the city in which effective programs of environmental education are underway. Such diverse sites as the Hudson River, an incinerator, Chinatown, Governors Island and a children's camp in a rural setting are analyzed for their contributions to the education of city children.

Design: Hersch Wartik

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