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The Status of Science Teaching Facilities in Iowa Museums

DEAN F. STRAFFIN

these are historical museums and are understaffed. Only a very few of Iowa's museums offer valuable resources for science teaching. Of the museums recognized in this survey as having a high degree of value in terms of science education, the scope of their potential use as teaching aids is limited to the "natural sciences" embracing such subjects as geology, astronomy, biology, zoology and the field of anthropology.

No Iowa museum reviewed in this survey seems to be of any notable value in the teaching of the "hard" sciences such as chemistry or physics, i.e., there are virtually no permanent or semi-permanent "science and industry" type exhibits in Iowa museums. Despite this, concerning the teaching of many of the natural sciences, a number of Iowa museums constitute gigantic and costly visual aids. Five of these institutions alone cost a total of over five hundred thousand dollars a year to operate and maintain. As educational devices they are taken very little advantage of by the schools.

To date, Iowa museums are practically uniform in their lack of coordination with the schools. To realize the potential value of these museums, the schools should attempt to integrate museum exhibits into the class curriculum, and make provision for trained museum teachers to interpret exhibits.

To date, there has been no evaluative survey of museum facilities made for the state of Iowa. Though this report is primarily focused on science teaching facilities, it also attempts to survey the educational potential of Iowa museums in general. The Museum Directory of the United States and Canada, published by the American Association of Museums and the Smithsonian Institution, Washington, D. C., 1965, lists many of the museums in Iowa; however, the most comprehensive compilation of museums is found in the Directory of County and Local Historical Societies and Museums in Iowa, 1966, compiled by Leroy G. Pratt of the Department of Public Instruction.

Though this directory was compiled primarily for the use of teachers of history in response to chapter 280 of the Code of Iowa which requires that the history of Iowa be included in the courses of study and taught in Iowa schools, the directory provides the most comprehensive listing of Iowa museums of any type.

One of the problems in attempting such an evaluative survey is to determine just what constitutes a science museum, since clearly definable science and natural history museums tend to grade into such things as zoos, nature parks and industrial exhibits.

Into this twilight zone would fall the exhibits of Effigy Mounds National Monument in Allamakee County in northeast Iowa. The hiking trails which pass by prehistoric Indian mounds contain informative diagrams and explanations dealing with archeology and pre-
history. The mounds themselves are, in a sense, educational exhibits with the labels provided by the National Park Service. The interpretation of the mounds is enhanced by more conventional museum exhibits within the visitors' center at the monument.

Though it is possible to view Effigy Mounds as an educational archaeological museum, this paper will deal only with the larger, "conventional" museums within the state.

Admittedly, many small museums within the state have been overlooked which contain "science" exhibits. However, there is a break between a few of the state's large museums and the majority of small historical museums. This break is based on museum size, not necessarily on quality. The author realizes that there are small historical museums in the state which are not qualitatively inferior to the museums surveyed in this report.

I have been able to distinguish only five museums within the state which offer any immediate unrealized potential for science teaching, and two additional museums which, though of little value at present, may prove to be of educational value at some time in the future. The five museums of primary concern are, listed alphabetically: (1) Davenport Public Museum, (2) Iowa State Department of History and Archives, Des Moines, (3) Museum of History and Science, Waterloo, (4) Sanford Museum, Cherokee, (5) Sioux City Public Museum.

The two additional museums surveyed, but of lesser immediate value as educational devices, are located at the State University of Iowa, Iowa City, and the University of Northern Iowa, Cedar Falls. The Plymouth County Historical Museum is also included in this paper for comparative purposes being typical of the many small museums in the state.

Though these institutions vary considerably in their scope and content, it is the author's opinion that most of them constitute valuable educational resources. Though these facilities are utilized in varying degrees by local educational systems, it is significant to note that only two of these museums have any type of integral program with their local school system; these being the Sioux City and Sanford museums. The other museums, though small in number, constitute valuable educational resources which are not adequately utilized at present.

Before proceeding to individualize the current status of Iowa museum science teaching facilities, it would be wise to present a brief historical account of the events leading the present position of museums in our society, and the roles they have played in the development of science, since today the educational role of museums has been greatly overlooked.

One of the earliest types of museums in the United States was the
college museum of natural history. The purpose of these institutions was "visual education," representing the harmony of the laws of nature and the rules of theology. With the acceptance of Darwinian concepts, the validity of such exhibitions was destroyed and college museums sank to the status of auxiliaries to laboratory research. Museums from this early period include the Peabody Museum of Natural History (Yale, 1802), the Mineralogical Collection of the University of Harvard (1784), the Dartmouth Collection (circa 1783) and many others. In Iowa, the S.U.I. and U.N.I. museum collections are the products of this category of college research museums dating from the late nineteenth century. Both museums, at present, are in a deteriorating condition.

The early academies of sciences were also important landmarks in the diffusion of learning in America, and their efforts took concrete and lasting shape in museum collections. Both the Sioux City and the Davenport Museums owe their existence to such early science academies.

In these early college and academy museums, education was considered a primary function. The first efforts of a museum to inaugurate educational work for the benefit of the public were made by the Buffalo Society of Natural Sciences in 1876; however, they were soon followed by the Davenport Academy of Natural Sciences in 1877, which attempted to establish a definite connection between the museum and the public schools. In that year the president of the academy stated that, "By aiding science, you are putting another stone into the foundation of our public school system. . . . The academy must, in the nature of the relations between the two, be the ally of our public schools. Nor are its benefits confined to the youth of the city. It is emphatically the citizens' school, the house of the mechanic, as well as the museum of the learned and the curious."

In 1889 a formal arrangement was made with the school authorities whereby classes from the eighth and ninth grades came regularly to the museum. After a successful trial period, W. H. Pratt, one of the founders of the academy, felt that the usefulness of the program was so great that he hoped the plan might become a regular part of the public school course of instruction, exerting a strong influence on the extension of natural science instruction in the schools.

The program of cooperation continued with slight interruption until 1904 when an arrangement was made between the school board and the museum trustees by which the school board voted to employ the curator for one-half time to teach science in the public schools. This proved to be a very popular program. The Davenport Academy of

1Adam, The Museum and Popular Culture, p. 526.
Science program was one of the earliest instances of financial aid being extended to a museum by a city board of education to provide for the teaching of children in organized classes.

Unfortunately, at that time the Davenport Academy Museum depended almost entirely upon contributions and did not have substantial financial backing. Though the museum’s first major endowment came in 1903 from the estate of Mrs. Mary Putnam, it was at this time that the museum entered a period of “dark ages” during which funds were generally scarce and very little was published. Professor J. Paarmann, who was the museum director from shortly after the turn of the century (1902) until the 1920’s, attempted to promote a cooperative program with the local schools and was a popular teacher with classes of local children. After Paarmann’s death in 1927, a succession of different directors passed through the museum and evidently the museum and local school system drifted apart. Since then no museum in the state, to the author’s knowledge, has had an integral educational program with the school system.

Following are the results of a survey of the museums under consideration in terms of the following categories: (1) brief museum history, (2) general resources (funding and personnel), (3) science resources (collections), (4) physical plant, (5) exhibit program, (6) science teaching and ancillary programs, and (7) evaluation and potential of science teaching.

**MUSEUM HISTORY**

*Museum of History and Science, Waterloo*

The museum was made possible by the bequest of Henry W. Grout who died in 1932. In 1933, three men were appointed as trustees of his personal collection of thousands of geological, anthropological and historical articles and his bequest. At the time of the receipt of the bequest, much of it in the form of real estate, its value was estimated at about $100,000 exclusive of the collection. It is presently valued at approximately $700,000.

At the time of the receipt of the collection by the trustees, it was housed in various parts of the courthouse and was eventually transferred to a room in the Y.M.C.A known as the Grout Room. In 1948 more than half a block opposite the city park was acquired for the eventual construction of the community museum to house the Grout Collection. The museum was constructed in 1954-1955 and opened to the public in August, 1956.

In addition to the original collection, the museum has received many gifts. Mrs. Genevieve Woodbridge has been the museum director since 1955.

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3 Ramsey, op. cit., pp. 5-7.
4 Iowa Official Register, p. 196.
Iowa State Department of History and Archives, Des Moines

The State Historical Department was organized in 1892; the State Historical Building was erected in 1898 with an addition in 1908. The department was reorganized in 1939 as the Iowa State Department of History and Archives. Through donations, the collections have grown to sizable proportions.

State University of Iowa, Iowa City

The Iowa Museum of Natural History was established by an act of the state legislature in 1858. It was first housed in the Old Capitol Building for 28 years and called the "Cabinet of Natural History." Museum collections grew as the result of expeditions financed by friends of the university and contributions by many individuals. About 1890 the museum was allied with the department of zoology. It was separated from the department in 1926, and from then until 1949 the museum was a separate division of the university. The museum was then made a department in the School of Fine Arts.

During the early years the museum was used by scientists who were classifying and naming different natural objects pertaining to their various fields. There was no attempt to exhibit the collections for the benefit of the public. Eventually the collections were placed on exhibit in Macbride Hall. By 1926 the study of systematic zoology was being replaced by morphological and experimental studies and the zoology department came to have little use for the museum. Many cases were moved into corridors and many specimens were packed away. Though a number of new educational exhibits have been added since that time, the museum has occupied essentially the same space for the last 40 years. In the last two years, museum space has been subject to further attrition through the loss of space in the Bird Hall Annex to other university functions.

University of Northern Iowa, Cedar Falls

The inception of the U.N.I. museum started with the acquisition of a shipment of rocks from Ward's Museum, Rochester, New York, in 1892. In 1893, a joint expedition with S.U.I. to the Bahamas added large collections of corals, crabs, sponges, and shells. Over the ensuing years, contributions added thousands of specimens to the college collections and the exhibits were moved from building to building as the collections grew. The collections were intended as teaching aids and the ideal in building the Iowa State Normal School Museum was not the exhibition of show pieces, but to provide instructional material. By 1902 the museum was being referred to in the college bulletin as "a museum of minerals, plant, animals, fossils, etc., particularly arranged and organized to teach Iowa teachers local . . . fauna . . . mineralogy, etc."

The museum supplemented contributions of donated objects with
purchased items not likely to be contributed. In 1911, Professor M. F. Arey was appointed curator of the Natural History Museum and held the title until 1928. About that time, responsibility for the museum came into the hands of Doctor E. J. Cable, though there was no one with the title “Curator of the Natural Science Museum” from 1928 to 1949. In the 1940’s, the museum acquired quantities of historical material through donations.

In the last few decades the museum gradually lost its allocated space to other college functions and was eventually closed in 1965. The collections were moved to their present location in the rear of the college physical plant in 1966. It is the hope of the present director, Doctor Pauline Sauer, that the museum will be able to re-open soon in its present new location.

Sioux City Public Museum

The museum was started in 1858 largely because the Sioux City Lyceum needed space for exhibiting the birds and animals collected by a number of its members. The collections that were made by the “Academy of Science and Letters of Sioux City, Iowa” were housed for a considerable period of time in the Sioux City Public Library. In 1960 the collections were transferred to their present location, the present building being a former mansion built in 1890 by Sioux City resident John Pierce. This structure was given to the city by the Junior League to be used for museum education. The building and its contents now belong to the city.

Sanford Museum, Cherokee

The Sanford Museum and Planetarium was made possible through a trust fund established by the late Mrs. W. A. Sanford of Cherokee in 1941. It was the Sanfords’ intention to create a charitable trust for historical, cultural and educational purposes which was to be free and open to the public. The endowment was invested and allowed to grow until 1950 when enough money was removed for the construction of the museum building. The museum was officially opened to the public in April, 1951.

Plymouth County Historical Museum

The museum was founded April 22, 1965, sponsored by the Lions Club of LeMars which provides approximately $500 yearly for operating expenses. The museum is housed in a building constructed in the 1940’s as an administration building for Westmar College. It was later acquired by a rural electric power company and eventually became vacant. The city of LeMars now provides the building for museum use. The collections have been built around the personal collection of musical instruments owned by Mr. C. B. Parkinson and the former museum collections of miscellaneous materials from Westmar College. This museum is typical of many museums not included
in this paper due to its small size and consequent limited educational potential; however, the LeMars museum is unique in that it is a participant in the Federal ESEA Title III School-Museums Project conducted by Woodbury County.

Davenport Public Museum

Part of the history of the Davenport museum has been presented in the opening paragraphs of this paper. The Davenport Public Museum was founded by a group of citizens in 1867 as the Davenport Academy of Natural Sciences. Large collections, containing many thousands of specimens, were made throughout the world and donated by leading citizens. The museum was housed in a succession of rooms as it expanded. In 1877, land was donated for a museum building and in 1898 an adjacent church building was annexed. In 1930 an additional structure was added by means of funds provided by the Putnam estate. In 1961 the W. C. Putnam estate contributed over $1 1/4 million for the erection of a new, modern air-conditioned and fireproof building. This structure was enlarged in 1966 by the addition of the Palmer Memorial Wing. The early period in the development of the Davenport Museum is described in (1) Proceeding of the American Association of Museums, volume 2, 1908, “The Educational Work of the Davenport Museum,” (2) The Museum in America, volume 2, Lawrence Vail Coleman, 1939, (3) “The Davenport Academy of Natural Sciences” by Frederick Starr, in Appleton’s Popular Science Monthly, volume 51, May, 1897, pages 83-98.

General Resources

Museum of History and Science, Waterloo

Staff (1) Director: Mrs. Genevieve Woodbridge (director is also the designer and curator), (2) Secretary, (3) Library aid, (4) Maintenance man, (5) Four retired teachers are salaried part-time to conduct tour programs, (6) Volunteer help.

Authority Three trustees.

Funding Interest and dividends from $700,000 trust, presently providing approximately $24,000 yearly.

Iowa State Department of History and Archives, Des Moines

Staff (1) Mr. Jack W. Musgrove, curator (administrative head), (2) director, (3) three designer-preparators, (4) librarians, archivists, guards, secretaries, matrons, etc., giving a total of 26 staff members.

Authority The curator is selected by a board of trustees—the Governor, a member of the Supreme Court and the Superintendent of Public Instruction.

Funding Money to operate the museum is derived by appropriation after convincing a legislative committee of the department’s needs.
The yearly operating costs for the entire museum is approximately $200,000.

**State University of Iowa, Iowa City**

*Staff*  
(1) Curator, Walter Thietje,  
(2) Instructor.

*Authority*  
Administered by the University as a department in the School of Fine Arts.

*Funding*  
Maintained by the University.

**University of Northern Iowa, Cedar Falls**

*Staff*  
At present the museum is operated by the director and student help only. The director, Dr. P. Sauer, is from the U.N.I. Science Department of Biology.

*Authority*  
The director is the sole decision maker concerning museum policy.

*Funding*  
The museum operates on $1,000 yearly budget with all the physical plant requirements and director's salary being taken care of by the University. The budget is not fixed, but based on the museum requirements as delineated by the director.

**Sioux City Public Museum**

*Staff*  
(1) Director, Mr. William Schwarting,  
(2) secretary (part-time),  
(3) two receptionists (part-time),  
(4) registrar (part-time),  
(5) museum attendant (part-time),  
(6) matron.  
Title III employees include program director, Mr. Austin Cole, two full-time teachers, one part-time teacher and a preparator.

*Authority*  
The museum director is responsible to the city manager who is in turn responsible to the city council. The city council appoints an advisory board of trustees who review the museum's work and render their opinions. In addition the Sioux City Museum and Historical Association comprises an incorporated group organized to assist the museum. Though they are not vested with any authority, they influence the policy of the museum.

*Funding*  
The city manager and council review a museum budget submitted annually by the director. The yearly appropriation amounts to approximately $34,000, most of which is used for salaries ($23,000), the rest used for supplies and exhibits. A modest income from the museum association membership provides approximately $1,000. The museum has recently been provided with additional funds through the federal Title III program.

**Sanford Museum, Cherokee**

*Staff*  
(1) Director, Mr. Duane Anderson,  
(2) secretary-registrar,  
(3) technician-custodian (part-time),  
(4) week-end assistant (part-time).  
Title III employees include a curator of exhibits and a museum guide.
Authority The museum is governed by a board of trustees consisting of three members and a business administrator. The trustees define board policy, though the museum director has considerable freedom in decision making.

Funding The trust fund left by the Sanford family was invested, and presently provides annual returns of approximately $16,000 a year for operating the museum. In addition, the city of Cherokee also provides $4,000 a year for operating expenses, and the museum association, consisting of approximately 200 members, supplements this by contributing $5 per person in the form of memberships.

Plymouth County Historical Museum

Staff (1) Curator, Dr. B. F. Zeal, (2) combination guide, hostess, janitor is the only salaried person. Title III employees include a museum assistant, museum teachers and volunteer labor.

Authority The museum is represented by a board of 20 local businessmen who serve one-year staggered terms. The board elects a president, vice president, secretary and treasurer. The current president of the board of C. B. Parkinson.

Funding Funds are provided through the Lions Club of LeMars which provides $500 yearly. An equivalent amount is taken in at-the-door donations. The local radio station pays the museum's phone bill, and the city of LeMars furnishes the building and other utilities. Approximately 40 local clubs give donations ranging from $5 to $50 a year toward the support of the museum.

Davenport Public Museum

Staff (1) Director, Mr. Donald Herald, (2) exhibits and restoration man, (3) general exhibits assistant, (4) cabinet maker—physical plant manager, (5) custodian—projector operator, (6) natural history curator, (7) registrar (accessions and cataloging), (8) secretary, (9) sales desk and information, (10) part-time help in admissions, (11) part-time help in exhibits, (12) many competent volunteers.

Authority The museum has a 15-member board of directors plus a senior board of members of longer standing. The board members include businessmen and college faculty members from Scott County, Iowa, and Rock Island County, Illinois. The board meets monthly. The board members comprise a finance committee and an executive committee; it is necessary to get board approval for museum expenditures.

Funding Throughout the 100-year operation of the Davenport Public Museum, its income has been derived from membership fees, donations, endowments and admission fees charged for some of its activities. No public tax funds have been used for buildings or operation of the museum to date. Sixty-two percent of the funds used to
operate the Davenport museum are derived from the W. C. Putnam estate trust. In addition, an admission fee of 35 cents per adult and 25 cents per child is charged, though organized school classes are admitted free.

Museum membership dues provide approximately 10 percent of the museum’s operating cost and this is supplemented by income from the sales desk and money from other investments. Ten thousand dollars per year for 10 years has been provided from the Palmer estate. The estimated operation costs for the museum in the next years is approximately $114,000.

**Science Resources (Collections)**

*Museum of History and Science, Waterloo*

The museum collections are not large, but contain collections of rocks, minerals and fossils. There are also collections of sea shells and a few mounted birds. Ethnographic material includes a varied collection of North American Indian items and there are also a number of pre-Columbian artifacts. Though the collections are not extensive, they are adequate for the presentation of educational exhibits. In addition, the museum operates one of the few planetariums in the state, this being housed in a specially designed room. The majority of the museum’s collections are primarily historical-pioneer items characteristic of middle and late nineteenth century Iowa.

*Iowa State Department of History and Archives, Des Moines*

The museum is in the process of broadening its geological collections including paleontological and paleobotanical materials. Existing collections include fine examples of a wide variety of fossils as well as a sizable mineral collection.

There are also collections of archeological material from the plains and the woodlands as well as historic ethnographic material from the same areas. Museum collections emphasize most strongly historical material, especially that which has to do with the development of the state of Iowa.

The Iowa State Department of History and Archives is presently responsible for the publication of the *Annals of Iowa*, a historical magazine issued quarterly, which was first published in Iowa City from 1863 to 1875. It was later published privately for a few years and the museum took over in 1883 and has been publishing the Annals since that time.

*State University of Iowa, Iowa City*

The S.U.I. museum of natural history is perhaps the only museum in the state whose collections deal entirely with natural history. These collections include many hundreds of mounted specimens of birds, mammals, reptiles of a wide variety and sampling a wide geographic
range. Large study collections of birds are also maintained. There are also collections of invertebrates including many shells, and collections of ethnographic material including North American Indians, Eskimos and Philippine items. There are also limited collections of geological material.

University of Northern Iowa, Cedar Falls

The museum possesses an unusually large geological collection including both mineralogical and paleontological specimens. The collection of mounted birds, while not large, is a "good representative collection with excellent taxidermy work." There are also mounted specimens of many North American mammals. The museum also contains large quantities of North American archeological materials as well as a group of European paleolithic implements and miscellaneous ethnographic collections. There are also over 30,000 specimens of well documented shells. A number of historic and pioneer items are to be found in the collections of a very diverse nature, including uniforms, weapons, dishes, etc. A small quantity of old books is also included.

Sioux City Public Museum

Though the museum's collections are not extensive, it does contain valuable teaching collections of rocks, minerals, fossils, archeological and North American Indian ethnographic material. Biological collections include a small collection of stuffed birds and animals characteristic of local fauna as well as a number of live reptiles. In general, the collections reflect an emphasis on natural history and historical cultural items.

Sanford Museum, Cherokee

The museum contains a sizable collection of Pleistocene vertebrate fossils, quantities of documented archeological material, insect collections, rocks and minerals, botanical collections, mounted specimens of local fauna, and ethnographic collections from various North American Indian culture areas. In addition, the museum possesses a quantity of regional historical items.

In terms of the "physical sciences" the museum possesses one of the few planetariums in the state.

The museum also publishes the newsletter of the Northwest Chapter of the Iowa Archeological Society.

Plymouth County Historical Museum

Museum collections are small; natural history materials are almost entirely lacking except for a few stuffed animals. The majority of the materials are historical, including primarily antique musical instruments and pioneer items. A log cabin and old schoolhouse adjoin the museum.
Davenport Public Museum

The museum contains huge collections, only a small proportion of which are in public displays. In terms of natural history collections, the museum has the following specimens: plants, 30,000; insects, 20,000; minerals, 2,500; rocks, 5,000; fossils, 25,000; birds, 3,500; mammals, 350; shells, 80,000. Archeological specimens include: Egypt, 4,500; Europe and Middle East, 20,000; Mexico, 4,000; Peru, 800; Panama and Honduras, 300; and United States, 50,000. Ethnological specimens include: American Indian and Eskimo, 3,000; Far East, 8,000; Pacific Ocean area, 400; Africa, 800; Europe, 400; Central and South America, 300; and American history specimens, 10,000. There are 5,000 art specimens and library materials and publications include 50,000 volumes, 18,000 photographs and 10,000 documents.

Physical Plan

Museum of History and Science, Waterloo

The museum contains a planetarium, pictorial history hall, science hall, Grout Hall of Indian culture, rocks, minerals, fossils and shells, reference library (Iowa and local history), an auditorium, a pioneer hall, and an early American arts and crafts hall. In addition there is a carpenter shop, work and research room, costume storage repository, garage, offices and restrooms. The museum, built at a cost of $235,000, contains 20,000 square feet with about 15,000 square feet devoted to exhibits.

Iowa State Department of History and Archives, Des Moines

The Historical Building in Des Moines, besides housing the museum, contains the Traveling Library and Medical Library which are not under museum jurisdiction. The museum exhibits occupy one-half of the third floor, one-half of the second floor, one-third of the main floor and the corridors in the basement. There is roughly 10,000 square feet devoted to exhibits. The museum also includes a shoproom for the construction of small cases and exhibits, the museum library, and a limited repository for museum collections. Most items are on display. There is also a large, full repository of papers and documents. Lack of storage facilities is acute.

State University of Iowa, Iowa City

The museum is located in Macbride Hall on the S.U.I. campus. Exhibits are to be found along the ground and first floor corridors and in the major wings of the third floor. Collections are stored in the attic, and several rooms on the ground floor serve as preparation rooms and offices. Macbride Hall is also shared by several other departments including home economics, sociology and anthropology, and includes many offices and classrooms as well as an auditorium.
University of Northern Iowa, Cedar Falls

The museum exhibits are contained within one large room, adjoined by a sizable repository, a preparation room, restrooms and office. No lecture hall is available and only a small student study area is provided. A small library of about 500 books is kept in the repository. The total museum facility is 7,500 square feet.

Sioux City Public Museum

The museum is hindered by the fact that exhibits must conform to the floor plan of a structure which had been designed as a house. Most of the rooms, while large compared to most homes, averaging 12 by 16 feet, tend to break the continuity in museum exhibits. A total of about 2,500 square feet is presently utilized by exhibits. In addition to the exhibit area, the museum also contains several offices, a carpenter workshop, preparator's office, repository, kitchen and mimeographing room and a well supplied dark room. A ballroom on the third floor of the old mansion functions as a small lecture hall. In general, the structure is ill-suited to house a modern museum and does not lend itself to change and expansion.

Sanford Museum, Cherokee

The museum building was constructed in the early 1950's at a cost of $100,000 from funds derived from the Sanford trust. The museum, on two floors, contains three major exhibit areas consisting of an east gallery, west gallery and natural history hall, and a Period Room and Planetarium. One of the exhibit areas is also a small auditorium. In addition, the museum contains a repository for archeological and paleontological collections, an archives room, library, historical collections repository, workshop, upstairs storage room, double garage storage area and two offices. The museum contains approximately . . . square feet with about . . . square feet devoted to exhibits.

Plymouth County Historical Museum

No figures are available concerning the over-all dimensions of the museum. The collections are housed in a number of rooms which were originally intended as offices and medium-sized classrooms. There is no storeroom, repository or work space.

Davenport Public Museum

At present, the Davenport Museum is the largest and one of the most modern museum facilities within the state of Iowa. It contains 50,000 square feet of space, approximately 40 percent of which is devoted to exhibits.

Besides the various exhibit areas and the lecture hall, the museum contains a library, several classrooms, storage areas, a workshop, registrar's workroom, darkroom, exhibit preparation and restoration facilities, fumigation chamber, toilets, coatroom, natural history workroom,
kitchen, and numerous offices. The building was specifically designed with modern museum techniques in mind, and expansion is feasible if it should prove necessary.

EXHIBIT PROGRAM

Museum of History and Science, Waterloo

Exhibits contain much of the material listed under collections, the orientation is primarily toward history and natural science. A variety of different types of exhibits are employed, including wall and floor cases, open exhibits and cut-away room views of pioneer life. Exhibits are designed to be semi-permanent in nature, through traveling exhibits of varying types are utilized by the museum.

Iowa State Department of History and Archives, Des Moines

"The chief purpose of the department is the preservation of Iowa history from earliest geological time through the days of the Indians, the coming of the pioneers, to the present; to bring this history to life and make it available to the people of Iowa."

Though no "science and industry exhibits" are present, historical collections are supposed to reflect the idea of progress—how one thing developed into another as reflected in firearms, etc. Indian history of Iowa is traced from "the mound builders" to modern times; Iowa geology is represented by samples and fossils from every formation in the state; representative collections of Iowa wildlife are also displayed.

Most exhibits are permanent, though a few of the cases on the main floor are periodically changed. Occasionally loan exhibits are used to fill vacant areas.

Museum materials are occasionally loaned to other departments of state government, but collections and traveling exhibits are not generally available.

State University of Iowa, Iowa City

For the most part the materials in the museum are arranged systematically, starting with the ground floor which exhibits the more primitive life forms. Besides exhibits designed to show the major groups of the animal kingdom, there are also geologic maps and stratigraphic columns representing Iowa with samples of the rocks, minerals and fossils from the areas indicated.

There are also exhibits on taxidermy and systematic representations of the plant kingdom. The third floor exhibits include many mounted specimens ranging from bison and musk oxen to small birds and snakes. Many of these are arranged in ecological settings.

University of Northern Iowa, Cedar Falls

At present the museum is not open to the public. Eventually representative regional faunal collections will be exhibited as well as rocks,
minerals and fossils exemplifying basic geologic concepts. The director hopes to develop social science exhibits including ethnographic exhibits from various culture areas including China, India and Africa.

At present almost all displays consist of semi-permanent old-style glass case floor exhibits.

**Sioux City Public Museum**

In general, the collections are divided between American Indian artifacts (both archeological and ethnological) with a culture-area orientation, and a local pioneer history. A third orientation may be recognized in terms of life and earth sciences which emphasize local ecology. This is reflected in new exhibits under construction which will feature live reptiles of the Missouri drainage.

Most exhibits are in the form of wall cases accompanied by an occasional chart or open floor exhibit. Third floor exhibits on the periphery of the lecture hall are changed every two to three months while the other exhibits in the museum are semi-permanent to permanent in nature.

**Sanford Museum, Cherokee**

The Sanford Museum contains both permanent and temporary exhibits. Permanent exhibits include a Period Room furnished in the style of the middle nineteenth century, and exhibits on local history in the east gallery.

The west gallery is used for traveling exhibits, art shows, and special events. The exhibit hall in the basement is devoted to natural history. Featured are North American Indian cultural sequences, rocks, minerals, fossils (including a fluorescent display), and mounted animals. It is the objective of the museum to interpret regional geology, biology and archeology.

Special displays are rented or borrowed from other museums, art galleries, businesses and governmental agencies for temporary display. A calendar of future exhibits is available from the museum.

Such temporary displays include exhibits dealing with the physical sciences. For example, at present a $17,000 government exhibit on space technology is on display.

Most exhibits consist of wall cases and panels, many of which are currently being remodeled.

**Plymouth County Historical Museum**

No orientation is generally evident in the museum except that noted in the preponderance of late nineteenth century local objects. Exhibits reflect the collections available, which are of a diverse nature. Under the auspices of the Title III program a number of modern exhibition cases have been created containing African and other ethnographic material. The existing exhibits are intended to be permanent.
Davenport Public Museum

The major hall in the museum contains relatively permanent exhibits of geological and zoological nature. Most exhibits are anthropological, natural science or historical in nature.

A variety of temporary exhibits are to be found in the museum and, when possible, these are related to the subjects presented by guest speakers and lecturers.

A wide range of exhibition techniques are employed, ranging from open floor exhibits of large stuffed animals to live specimens exemplifying sea-bottom ecology, and wall cases and panels of varying types with dramatic lighting.

Science Teaching and Ancillary Programs

Museum of History and Science, Waterloo

At present, there are conducted class tours focusing on the museum collections and given for specific age levels. Tours last from 20 to 45 minutes.

Besides class tours, the museum circulates five loan boxes of materials constructed at a cost of approximately $500 each to the public schools to be used by third grade students.

The museum also offers a weekly film program dealing with nature, geology and history. No financial aid is given by the schools to the museum. School teachers do not conduct their own tours. The museum's planetarium, housed in a specially signed room, is booked a month in advance by school groups. The museum has a flow of over 30,000 visitors a year, 61 percent of which are school children.

Iowa State Department of History and Archives, Des Moines

Science teaching is limited to working with interested students in the form of personal instruction or science fair projects and identifying objects brought to the museum. Also, some materials are provided for the Des Moines Public School educational television station for the schools during the day and for adult educational television programs presented in the evenings.

Though the museum is heavily used by the schools and over 1,200 school groups were taken on conducted tours in the last year, there is no organized program between the museum and the school system. General school group tours last one to one and one-half hours and are conducted by the same individuals who collect, clean, prepare and make exhibits.

State University of Iowa, Iowa City

There is no educational program other than the exhibits themselves and the museum training offered as part of the college curriculum.

https://scholarworks.uni.edu/pias/vol75/iss1/48
Prior to the closing of the museum in 1965, study guides and question sheets for visitors from elementary school to college level were available. The amount of information acquired and retained by children using these guide sheets on a museum visit was noteworthy, particularly when the guides supplemented the local school curriculum and were done in conjunction with the teachers.

Sioux City Public Museum

In October, 1966, the Sioux City museum was provided with funds from a Title III grant under Public Law 80-10. Title III funds are provided to financially aid the following three areas: (1) organized class visits to any "educational site" (museums, parks, etc.), (2) in providing loan exhibits to children, (3) funds and materials to produce local audio-visual aids. To this end, grants in two consecutive years totaling $260,000 have been provided for a six-county area in northwest Iowa, these being Woodbury, Cherokee, Crawford, Ida, Monona and Plymouth Counties. These funds have been utilized by the Sioux City Museum and Art Center, the Plymouth County Historical Museum in LeMars, and the Sanford Museum in Cherokee.

A large part of the Title III funds have been used to get children to the museums. The Title III program provides 36 cents per mile for buses and 10 cents per mile for automobile transportation. Approximately 55,000 students per year have been visiting the institutions benefiting from the Title III grant. The Title III program includes educational programs for children in kindergarten through the twelfth grade. In the Sioux City Museum this means an average of 400 to 500 students per month, and a maximum of 1,000 students during peak months.

To handle the traffic, the Sioux City Museum has hired two full-time and one part-time teacher under the Title III program. These teachers offer museum tours on the following specific topics: (1) Indians, (2) pioneers, (3) rocks and minerals, (4) plants and animals, (5) prehistoric life, and (6) Sioux City history. Any school, public or parochial, in the six-county area can come to the Sioux City Museum for guided tours on these topics. In addition, one museum teacher travels to the schools to exhibit artifacts and teach the Indian topical tour offered in the museum.

Also, under the Title III grant the Sioux City Museum has constructed over 100 loan exhibit cases covering the six topics presented in the museum to visiting classes. Also, these are supplemented by a number of "tactile cases" containing objects that children may be allowed to feel and handle and used to augment the loan-exhibit cases.

Though, through the Title III program, the museum performs an educational function in relation to the schools not attained by other
museums in the state, the museum program still is not well integrated in terms of the school program. Probably no school class receives all six museum presentations. Though almost every school within a 50-mile radius has had at least one class visit to the museum under the Title III program, a speculative guess would be that 50 percent or less of the students who could attend and benefit from the museum program actually do so.

The class level distribution of visiting students reflects not only the pattern for the Sioux City Museum, but for other museums in the state as well. The heaviest traffic is by third and fourth graders while it is rare for eighth grade classes to attend and almost unheard of for higher class levels to take part in school-museum tours. The implications of this are discussed at the end of this presentation.

*Sanford Museum, Cherokee*

The Sanford Museum is a participant in the Title III program discussed under the Sioux City Museum. Under this program, the museum has received $5,000 for the acquisition of materials, with which the Natural History Hall is being remodeled, and hired a curator of exhibits and a museum guide who interprets the museum exhibits and collections. School classes come from a radius of approximately 50 miles or more and receive a one-hour tour. The Planetarium is heavily used, and booked full, well over a month in advance. Many teachers have made the Planetarium visit a regular part of their curriculum in astronomy. An attempt is made to tailor each demonstration to the specific needs of the teachers.

Records available indicate that in a three and one-half month period following the re-opening of the Planetarium last fall, which had been closed for a period due to lack of personnel to operate it, that 1,269 individuals attended the Planetarium program. Since most schools deal with space in the spring, the numbers expected to use the Planetarium in the following months may be expected to be considerably higher.

School classes are presented most strongly by sixth graders and below. Some ninth grade classes use the museum Planetarium since the school curriculum for this grade level includes a study of the universe. Practically no high school classes visit the museum.

In addition to the museum tours and the Planetarium program, the museum also offers special classes in museum work. The museum association also sponsors a bi-weekly film series, occasional guest lecturers, and has paid for radio-carbon test dates in conjunction with archeological work.

Staff members also receive a large number of inquiries concerning the identification of bones, rocks, artifacts and other objects, as well as questions concerning references to literature.
The museum is also in the formative stage of developing a research program. Work to date has been involved in compiling records, maps and reference material concerning archeological and geological sites. Field work in archeology is being planned which will provide training for students from the University of Iowa and amateurs of the region. Laboratory analyses will follow, leading ultimately to a published report of the findings.

A conservative estimate of the total use of the Sanford Museum facilities is approximately 20,000 for the last year.

Plymouth County Historical Museum

This museum and the many museums like it throughout the state would not be included in this survey except for the fact that it participates in the Title III program. In this respect, in the few months that it has operated with Title III aid, student classes have been visiting the museum on conducted tours at a rate of up to 150 individuals per week.

Davenport Public Museum

Science teaching other than the exhibits themselves is at a minimum. The museum does not supply the schools with any materials and does not conduct tours for visiting class groups although school groups who are not charged admission must make appointments prior to their visitation. The museum may handle as many as 12 school classes at one time. Class teachers are responsible for interpreting the exhibits to the children. During the 1966-67 fiscal year ending April 30, 1967, a total of 80,000 persons attended the museum's exhibits and programs. Five thousand of these were children in school classes and other educational groups. Another 21,000 school age children attended alone or with their parents. From May 1, 1967, to March 15, 1968, 11,094 children visited the museum, projecting these figures for the full fiscal year, approximately 13,000 to 14,000 children may be expected to visit the museum on organized class tours.

Evaluation and Potential for Science Teaching

Museum of History and Science, Waterloo

The museum, besides the current exhibits, also has collections of pioneer material, birds, insects and rocks and other items of limited quantity in its repository. Classes from the elementary grades are drawn from a 100-mile radius of Waterloo. Much more use could be made of existing museum facilities by the school system if closer cooperation existed between the two. If financial support were available to hire museum teachers to operate the Planetarium and conduct exhibit programs in relation to subject matter taught in the schools, the museum could serve in the capacity of an invaluable "visual aid" in education embracing natural science and history. The museum direc-
tor sees the need of a trained individual with a science background and a trained preparator as being of immediate need in the development of the museum's teaching exhibits.

_Iowa State Department of History and Archives, Des Moines_

Though the over-all orientation is historical and provides an excellent resource for college students doing historical research, the museum contains many exhibits on Iowa fauna, geology, archeology and ethnography. Since Des Moines is located at the junction of Interstate 35 and Interstate 80 (major east-west transportation routes), the museum draws school groups not only from all over the state of Iowa, but Wisconsin, Illinois, Nebraska and Missouri as well. (Approximately 5 percent of the visiting groups are from out-of-state.)

The administrative head of the museum feels that the museum needs more space, money and personnel. If this were possible, old fashioned cases could be eliminated and trained teachers could conduct tour programs. If these programs were organized in cooperation with school system curricula, the museum could prove to be an invaluable visual aid in the teaching of natural sciences.

_State University of Iowa, Iowa City_

Among the museum's many visitors each year are hundreds of out-of-town school children who come to the campus with their teachers. The practice has been a popular one for many years. There are students enrolled in the university today who first visited the campus on a class trip to the museum.

Though museum "tours" may be arranged through the University Relations Office, there are no trained personnel available to interpret the exhibits. The museum's primary obligation is toward the university and there is no cooperative program with the local elementary and secondary schools. The continuity of the museum is broken up by the distribution of exhibits throughout Macbride Hall and the effectiveness of the museum as a science teaching resource is greatly reduced due to the combination of these conditions.

_University of Northern Iowa, Cedar Falls_

Though the current museum is temporarily located in a structure not designed for museum needs, and many of the cases and exhibits are old, the museum has a good potential educational value. All museums depend upon the quality of their collections for whatever impact they may have on their students and the U.N.I. museum has fairly extensive collections in many areas of natural history.

One of the most serious drawbacks to the realization of this potential is the lack of trained staff members to develop the collections.

At present, the exhibits are being prepared primarily for U.N.I. college students and no cooperative programs with the local schools are being planned. Exhibits contain labeled specimens, but little else
in the way of illustration or design. This is primarily due to the understaffed condition of the museum, where the director must be responsible for all phases of the museum's operation. With the abundance of duplicated material in the museum collections, an extensive program of loan exhibits might prove feasible if the possibility were to be considered.

If any kind of educational program is to be initiated in the near future, other than general exhibit tours, a lecture hall or auditorium will prove to be a necessity. The director is primarily interested, at present, in acquiring a permanent building and developing the museum as a college research facility.

Sioux City Public Museum

The Sioux City Museum is one of the few museums in the state whose facilities are being heavily used for educational purposes by the school system. This is the result of the Title III program. In terms of science teaching, the museum still has a great unrealized potential in that many classes of students in the area served by the Title III project do not take advantage of the opportunity available to them, and that since most class visitors are in the third to fifth grade levels, a science education program appropriate for more advanced students has not been developed.

The museum director commenting specifically on the Sioux City Museum reflects a situation which characterizes other museums throughout the state. This concerns the attitude of the public toward the museum. In general, museums could have better public relations. Too often the educational potential of museums is overlooked at the expense of the stereotype of the museums as being little more than a collections of curios and oddities. Generally museums are so understaffed, that the director, who should be combatting this public image, is instead occupied with the duties of curator, preparator, registrar and janitor.

Sanford Museum, Cherokee

The Sanford Museum is developing an educational program focusing on modern exhibits of natural history and possesses an outstanding educational device in the form of one of the few planetariums in the state. In spite of this, it is felt by the museum director that the number of potential school classes that actually take advantage of these facilities is very low.

Lack of man hours and funds has been cited as being partly the cause for the slow development of the educational use of the museum facilities. However, increased funds and more personnel will not totally solve the problem of maximizing the potential use of the museum's educational facilities. This problem is discussed further in the general conclusions at the end of this presentation.
Plymouth County Historical Museum

This museum, though being utilized by school groups in noteworthy numbers, offers little, at present, in terms of science teaching, though it may have potential value in the historical perspective.

Davenport Public Museum

According to a Davenport Museum report, of the thousands of school children who have visited the museum in the past year, most received comparatively little from their visits in the way of meaningful learning experience. This is mainly due to: (1) their teacher's lack of familiarity with the exhibits and their content, (2) their teacher's lack of training in using exhibits as educational tools, (3) the lack of suitable pre-trip preparation for maximum use of the museum's present facilities, (4) the absence of museum-prepared printed material for the use of teachers planning visits, (5) the non-availability at present of quantities of educational material now in storage at the museum, and perhaps most importantly, (6) the lack of a staff of educators at the museum who could solve the five previously identified problems. In addition, many more classes never visit the museum because alert supervisory personnel are aware of this situation and therefore limit class attendance. 5

The lack of a staff of museum educators and the lack of a cooperative, integrated program between the school curricula and the museum constitute a severe limiting factor in the effectiveness of the museum in its role as an educational institution. It also constitutes an unfortunate loss of an extremely valuable educational device to the local school system. This situation characterizes practically every museum in the state of Iowa.

The Davenport Museum has attempted to promote a cooperative program with the schools, and tried to get support for museum teachers, but these efforts did not receive strong support from the schools. This is especially unfortunate since the Davenport Museum possesses some of the best science teaching museum facilities to be found in Iowa.

Conclusions

A survey of Iowa museums shows that of the more than 60 museums in the state, only a very few offer valuable resources for science teaching. Of the museums recognized as having a high degree of value in terms of science education, the scope of their potential use as teaching aids is limited to the "natural sciences" embracing such subjects as geology, astronomy, biology, zoology and the field of anthropology.

Although the museums in Waterloo and Cherokee possess planetariums, no Iowa museum reviewed in this survey seems to be of any

5Davenport Public Museum Abstract.
notable value in the teaching of the "hard" sciences such as chemistry or physics, i.e., there are virtually no permanent or semi-permanent "science and industry" type exhibits in Iowa museums.

If any significant point is to be made concerning the value of existing facilities for science teaching, it is that they are taken very little advantage of by the schools.

"The old adage that, 'A picture is worth ten thousand words,' has been amply underscored by the tremendous growth and development in recent years of the use of audio-visual aids in our schools and industries. An equally phenomenal development in the post-war years has been the growth of over 4,000 new museums. It has become apparent that in turn the real object or specimen is worth thousands of words. As a result, millions of school children annually visit the museums in their own and nearby communities to obtain first hand information in the fields of science, history and art.

If we set up a scale of depth of educational experience, we find that seeing pictures of an object or event provides a deeper experience than reading or hearing about it. Continuing with the idea we find that seeing real objects or events offers an even richer experience. Today's museum, particularly when provided with an educational staff of professional teachers, offers educational experience of more value by allowing students to handle objects and participate in events. To the students, life in past times and varied places becomes more understandable when they can grind corn in a Mexican metate, play African drums, use early American moulding planes, cut animal pelts with stone knives many thousands of years old, climb into a Victorian sleigh, feel the edge of a shark's tooth, or weight in their hands the difference between galena lead ore and volcanic pumice.

Class visits to museums are used to awaken or deepen student interest in various subjects. Such visits may be made preliminary to the start of a new subject area, in the midst of a study to pick up lagging interest, or at the end of a study to round it off. That some of these trips fail in their main endeavor lies in the fact that most of our school teachers are unfamiliar with the specimens and artifacts of their subject areas, their own training having so heavily depended on the spoken word, the written page or the generalized film."

The museums reviewed in this survey constitute "gigantic visual aids"—five of these institutions alone cost a total of over $500,000 a year to operate and maintain. These museums make their exhibits available to the schools free of cost, and in some instances even provide educational materials for the schools. Though these museums receive many school classes per year, their over-all effectiveness as teaching devices is greatly decreased by the lack of coordination be-

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Ibid.
tween the schools and the museum. The effect of this situation is compounded by the fact that one of the largest costs in operating museums is the provision of salaries for trained personnel. Almost all museums feel that they are inadequately staffed, and cannot afford, by themselves, to provide trained teachers to interpret exhibits to school children.

At present, attendance by school classes to Iowa museums is weighted heavily in favor of the lower elementary grades, with third grade seemingly being the leader in attendance records. The difficulties of museum attendance by higher secondary classes due to class schedule conflicts is recognized, but the point to be made is that museums are used by the schools in only a very limited fashion. The few museums reviewed in this survey could prove to be of much greater value, merely by increasing the amount of cooperation and coordination with the schools. If trained museum teachers could be provided, as Iowa had begun to do in the late nineteenth century, pioneer work in museum education with the Davenport Museum, the value of museums as educational devices today could be tremendous.

Though the museums considered in this survey are few in number, it is to be remembered that they provide facilities for a much larger area than many school districts combined.

In general, the present relationship of the schools to the museums is marked by sporadic use, usually the result of the initiative of individual school teachers, and general apathy by the school system as a whole. This is keynoted by the attempts of the Davenport Museum to develop an educational program with the schools in the Quint-City area which failed due to lack of interest; the Davenport Museum being one of the finest museums in the state.

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