HISTORY
of the
CEDAR CREEK
NATURAL
HISTORY AREA

A. C. HODSON
University of Minnesota
Field Biology Program
- Occasional Papers
  Number 2
CEDAR CREEK
NATURAL HISTORY AREA
...dedicated to the preservation
and study of natural habitats

University of Minnesota ~

Minnesota Academy of Science
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HISTORY
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NATURAL HISTORY
AREA
A. C. HODSON

Prologue

This history of the origin and development of the Cedar Creek Natural History Area is dedicated to Dr. Donald B. Lawrence, Professor Emeritus, Department of Botany, and his wife Elizabeth. They became actively involved in the early stages of the Area development when they presented 130 acres of land to the Minnesota Academy of Science, to be included in what was then called the Cedar Creek Forest. They presented this land as a living memorial to Dr. Lawrence’s father, William Charlton Lawrence.

Dr. Lawrence left Reed College at the end of his junior year to enter The Johns Hopkins University of Higher Studies, where he met Elizabeth, a geneticist graduate of Mount Holyoke College. He graduated from The Johns Hopkins with a Ph.D. in Plant Physiology without receiving either a BS or MS degree, and in 1937 he joined the staff of the Botany Department at the University of Minnesota as Instructor. In this position he had the good fortune to assist Dr. William S. Cooper, the discoverer of Cedar Creek Bog and Lake, in his Field Ecology course. Don and his wife had been engaged in studying the vegetation and geomorphic history of the Columbia River Gorge, and later the volcanic history of Mount St. Helens, the glacial and volcanic history of Mount Hood, and the responses of transported trees on the Gros Ventre Landslide in Wyoming, all based on the study of tree rings. Still later he investigated vegetative succession in Alaska as related to nitrogen economy and to Neoglacial history, and as Professor also demonstrated glacial synchrony in southern Chile, Argentina, and New Zealand. For five years Dr. Lawrence was Botanical Editor of Ecology, and in 1958 he toured the northeastern states on a Sigma Xi—Research Society of America lectureship on “Glaciers and Vegetation in Southeastern Alaska.”

Dr. Lawrence and his wife have been very active in the development of the Nature Conservancy in Minnesota, Oregon and nationally. As one example he estab-
lished a 380 acre "Lawrence Memorial Grassland Preserve" in Wasco County, Oregon as memorial to his parents. The breadth of his interests is evident from his being involved in the study of the uses of biological resources by ancient and modern man. This interest led him to search for Asian origins of North American aboriginal names of plants, animals and places.

From 1950 to 1953 Don and Elizabeth designed and built, with major help of a carpenter neighbor, James Sheffel, on their own land adjacent to Cedar Creek, perhaps the first passively solar-heated cabin in Minnesota. It is now on land transferred in 1970 to the Cedar Creek Natural History Area, and is leased to the Lawrences for their continuing use. In 1958 he became involved with Drs. J. Roger Bray, J. Derrick Ovington, and others in research on "Some energy relations of terrestrial ecosystems", centered at CCNHA, and served as Director of this project supported by the Hill Family Foundation. He has continued to carry on research at Cedar Creek since his retirement in 1976. Dr. Lawrence's contributions to the growth and welfare of the Cedar Creek Forest Area have been legion. He not only has served on the Advisory Committee and as its Chairman, but has been actively engaged in the deliberations and recommendations of important special committees dealing with the management of the Area for many years. In these capacities he could always be counted on to provide wisely conceived constructive proposals and criticisms.

In a letter to Dr. Lawrence, Dr. Marshall described the contributions that a number of people had made to ensure the success of the Cedar Creek project. He ended this letter by saying:

"Finally—what are you going to do about one Donald B. Lawrence? Certainly of all the people involved over a period of time you are not only the 'Patriarch' (excuse the term) but you were more than generous with your time,
very constructive in your activities and proposals, and continuously held to
the principle that CCNHA was a place of beauty and significance."

I am both pleased and honored to have this opportunity to acknowledge the
outstanding contributions that Dr. and Mrs. Lawrence have made to the great ben-
efit of the Cedar Creek Natural History project, and thank them for their assiduous
editing of the History manuscript.

Acknowledgments

The author wishes to express his sincere appreciation to Dr. Donald Lawrence,
his wife Elizabeth, Dr. William Marshall and Dr. John Tester who reviewed the
manuscript and offered many suggestions for its improvement. Dr. Lawrence also
provided most of the photographs. Dr. David Parmelee encouraged the author to
undertake the writing of this historical account, and provided the services of Diane
Berube who used exceptional care in typing the original manuscript. The events
described since 1962 were obtained for the most part from the excellent Annual
Project Reports assembled by Drs. Marshall and Parmelee. Beverley Medvecky is
to be commended for her selection of items from the Cedar Creek files, and
Penelope Krosch assisted in many ways by locating documents in the University
Archives. Finally, the author owes a debt of gratitude to Dr. Kenneth Keller, Presi-
dent of the University, who provided funds to defray the printing charges.

To provide a concise and eloquent preview of the history of the Cedar Creek
Natural History Area the following statement prepared in April 1984 by ‘Dr. Don-
ald Lawrence is presented as an introductory chapter.

Historical Perspectives, Objectives,
and Obligations

History of land acquisition and management

The Cedar Creek Natural History Area is primarily a research facility proposed
and initiated by the Minnesota Academy of Science (MAS), which contributed it to
the University to provide scholars in various disciplines and their advanced stu-
dents with relatively undisturbed lands in which to carry out field observations
and experiments. The tract is comprised now of 5460 acres (2185 ha) in northern
Anoka and southern Isanti counties. It consists of uplands, wetlands, lakes, and
ponds, and agricultural fields of various ages since abandonment. There is a well
equipped laboratory with adjacent living quarters for staff and students. Through
agreements with MAS, the tract is maintained by the University under the admin-
istration of the Graduate School Dean, who appoints a Director and an Associate
Director. Under the guidance of the Cedar Creek Advisory Committee, also ap-
pointed by the Graduate School Dean, along with MAS members from other insti-
tutions, land management plans have been developed. These include a program
of prescribed burning to systematically reinstate conditions that prevailed for cen-
turies in the natural landscape. Also, there is an ongoing program to retill, recrop,
and reabandon periodically old formerly cultivated fields so that a series of surfaces of different ages would be available continually for chronosequence studies. One notable achievement has been the long-term maintenance of an extensive oak savanna through prescribed burning practices by University faculty while training forestry, wildlife, and biological sciences students, including some from nearby high schools. A Resident Manager supervises the area; his salary is paid by the University, at present through the budget of the College of Biological Sciences.

The CCNHA facility serves the University broadly by accommodating five colleges from the Twin Cities campus. It also serves other colleges and universities within and outside of Minnesota, including visiting scientists from abroad. Entrance permit cards are issued to class instructors and prospective and active researchers. One-day class visits are frequent in spring and fall, as are scheduled tours year around, and short courses and field experiences for longer periods in mid-winter have been provided. A nature trail and picnic area is maintained for the public on the east side of Fish Lake on land acquired through matching funds from the Minnesota Natural Resources Commission of the legislature and LAND & WATER CONSERVATION (LAWCON) grants from the federal government.

The first 500 acres were acquired through purchase and gift by the Minnesota Academy of Science as a nucleus for the establishment of CCNHA, beginning in 1940. Transfer of title to these lands to the University of Minnesota was initiated with the understanding that the University would keep and preserve them in their natural condition, administer the area so as to encourage its wise use for scientific and educational purposes, and permit the Academy to co-operate in fostering and carrying out natural history studies, it being understood that access for such use by qualified and suitable persons would not be limited to persons having an official connection with the University of Minnesota. The University agreed to "set up a committee representative of the various fields of natural history, which committee under the general direction of the President and the Board of Regents of the University shall have the care and supervision of the forest and its uses." [The CCNHA was at that time called "Cedar Creek Forest" but the name was changed because of objections of the Dean of the School of Forestry.]

As the CCNHA research program grew it became evident that a buffer area should be acquired surrounding Cedar Bog Lake where the Buells and Lindemans had done the first important research. Funds became available to the Minnesota Academy of Science and the University, jointly, from the Fleischmann Foundation for further land acquisition, and construction of the Laboratory. Much of the buffer area acquired consisted of abandoned farm land, and some still being cropped, and it was soon recognized that some of the agricultural lands could become important for research on terrestrial ecosystem development following abandonment, and other fields could be encouraged to regenerate ecosystems similar to those of adjacent natural areas. These objectives have been actively pursued as the tract grew to its present size with state and federal LAWCON funds. One major importance of the buffer zone is to slow down the process of urbanization and help to isolate the most vulnerable natural areas from unwanted human disruption. By 1984 only 180 acres (four 40- and one 20-acre compartments) of land planned for the complete CCNHA remain to be acquired. These tracts are difficult to purchase because of reluctance of owners to sell, or of excessively high acreage costs. However, a surveillance is maintained with the plan that these remaining few acres can be obtained to fill out the western border of CCNHA.
Buildings and Grounds

Most of the recent land acquisitions were acquired and the original laboratory was constructed using funds granted by the Fleischmann Foundation. Maintenance of physical facilities has been under the supervision of the Twin Cities campus Physical Plant Operations since 1977. Minnesota State Legislature awarded $42,470 to upgrade the Bioelectronics portion of the Laboratory in 1978. From monies generated through research grants, a garage-shop building was built in 1977, and a pole-type storage facility was erected in 1979. A major addition to the Laboratory and an adjacent residence for staff were constructed in 1983-84 with funds provided by the National Science Foundation, the Freshwater Foundation and the University of Minnesota. Further funds to equip an analytical laboratory were provided by the National Science Foundation and the University of Minnesota.

In 1956 a simple single strand “riding” wire fence was constructed to mark boundaries with public roads inside CCNHA and on the entire periphery. This was quite effective in reducing trespass but did not interfere with the wildlife. In 1978 and 1980 woven wire fences were installed at the southeast corner and along part of the east side adjacent to new housing development were pressure of people and dogs was especially strong: this has been very effective. In the winter of 1963-64 walks were made from railroad ties laid end to end on peatlands leading to Cedar Bog Lake, and to Beckman Lake. These have allowed researchers and large groups of students to observe the bog plants and animals at close range without disturbing the ecosystem.

Integrity of Site

Protection of CCNHA habitats from possibly irresponsible researchers* and outside interference is one of the most important and difficult tasks in maintaining the integrity of the site. A number of steps have been taken to keep abreast of these continuing problems of internal research use and external encroachment by adjacent land owners as well as casual unauthorized visitors. In 1975, CCNHA was designated a National Natural Landmark by the U.S. National Park Service. In 1977, it was included with the Itasca Forestry and Biological Station among those sites evaluated as potential Experimental Ecological Reserves (EER) in a proposed network under the auspices of the National Science Foundation. In 1982, CCNHA was funded by the National Science Foundation as one of eleven sites in the United States for Long-Term Ecological Research (LTER). The Helen Allison Savanna, an 80-acre preserve of The Nature Conservancy, Inc. (TNC), leased to the Minnesota State Department of Natural Resources (DNR) as a unit of the State’s Scientific and Natural Areas (SNA) system is available, with permission from TNC and DNR for non-disruptive observational research. It is located just south across the road that marks the south boundary of CCNHA. It is managed by periodic prescribe burns and exotic weed removal by hand pulling.

Files and Records

There is an obligation to retain a collection of all reports, theses, and publications resulting from research done at CCNHA, sets of maps and aerial and other photos of the area, and to have on its staff at least one person knowledgeable in the

*Experience in New Zealand with the management of their Scenic Reserves has shown that members of the scientific community are far more likely to disregard the regulations than are members of the general public.
Background Events and Early Use and Development (1929-1947)

The Cedar Creek Natural History Area is considered as an outlier or relic of a northern coniferous forest. As described by Dr. Donald B. Lawrence (1963) it occupies the central part of the Anoka Sand Plain in Minnesota with a gently undulating surface of late Wisconsin glacial outwash, dotted with ponds, and partially dissected by the meandering Cedar Creek. The landscape is a patchwork of northern coniferous forest, deciduous forest, and prairie. This patchwork is further subdivided by differences in depth of water table and by development stages of recovery from past lumbering, farming, and fire. Mainly because of the diversity of native floras, introduced weeds, varying water levels and surface ages, there are a great many kinds of communities in close proximity. For these reasons the area is especially satisfactory for many kinds of comparative studies.

In addition to the floristic features the area is inhabited by such northern forest animals as beaver, white-tailed deer, ruffed and spruce grouse, the Canadian jay, and even the rare arctic three-toed woodpecker. The location of the area, only about 30 miles north of the University of Minnesota, makes it easily available for both teaching and research.

The discovery of the Cedar Creek Forest, as it had been called, was in itself quite remarkable. Grace Nute, while on a weekend trip to the north shore of Lake Superior, had questioned her friend, Cora Cornia, about the origin of the interest in the acquisition and preservation of the Cedar Bog. Consequently, in June of 1938 Dr. Lawrence wrote to Dr. William S. Cooper with the request that he inform Mrs. Cornia about how he had discovered the area and when he and Dr. Otto Rosendahl had first tramped around in the swamp. Dr. Cooper’s letter to Cora Cornia, dated June 19, 1938, included the following account.

"The airplane trip on which I first saw the bog took place on April 6, 1930. My pilot was Mark Hurd and the plane was a very small one intended for one person; two of us crowded into it. There was a terrific north wind blowing, and I remember noticing that the north-bound cars were moving faster than we were. It was quiet when we turned around and headed for home. Our route that day was straight north over New Brighton, Ham Lake, Fish Lake, then circling around to cover the northeast corner of Anoka County. Incidentally, the door on my side of the plane was removed, to give me a little more extra room and to make vertical shots possible. I don’t mind looking down."

"As to the date of Dr. Rosendahl’s visit with me, I cannot give an exact date. I made a very complete set of field notes on July 11, 1931, but I cannot believe that I waited more than a year to investigate the place that had inter-

William S. Cooper, who discovered Cedar Creek Forest. 1936.
ested me so much from the air. I can say with some assurance that this visit was sometime during the summer of 1930, probably early in the season. I took along the picture that I had made from the air, and we struck in from about where the Crone property now is. On our first attempt we missed the lake entirely, coming out on the upland east of it. Our second try brought us to the south end of the lake.”

According to Dr. John W. Moore (1952) the Cedar Creek Forest first received serious attention in 1929 when N. C. Huff visited the Isanti County portion of the bog. On the 24th of June in 1929 he obtained pictures of Pyrola asarifolia. In a letter that Dr. Lawrence received from Helen Buell, the wife of Dr. Murray Buell, she raised an interesting question.

“Does anyone around Minnesota know that Cedar Bog Lake used to be called Decodon Pond? (and the bog Decodon Bog?)—because Rosendahl and Butters were so impressed with the Decodon. I didn’t know it by any other name when we were students.” [1930-1933]

(The University Herbarium’s earliest collection of Decodon from the Area is by Dr. Rosendahl on Aug. 13, 1931; the next is by Murray and Helen Buell on Aug. 3, 1933, the place designated “Decodon Pond”.)

As will become very evident the Minnesota Academy of Science became much involved in the early development of the Cedar Creek Natural History Area. The Academy held its first annual meeting in 1933 with Dr. William A. Riley, the former head of the Department of Entomology and Economic Zoology, serving as its first President. Four years later W. S. Cooper, H. K. Wilson, and E. T. Tufté associated themselves with the intention of forming a corporation under the name of the Minnesota Academy of Science. On October 26, 1937 the Academy was incorporated as witnessed by Mike Holm, the Minnesota Secretary of State. That same year the Academy established a Committee on the Preservation of Natural Conditions. According to an account written by Dr. Arthur N. Wilcox,
"Soon after the appointment of the Committee its attention was called to the desirability of a portion of this area by Dr. William S. Cooper, who had become acquainted with the area after discovering it from the air. The preservation of this portion, known as Cedar Creek Bog, included a small lake, bog and wooded swamp, was recommended in the committee's first report published in the 1936 Proceedings."

Some correspondence between Drs. Cooper and Wilcox provides some interesting sidelights. On June 24, 1937 Cooper, who was then President of the Academy, wrote to Dr. Wilcox as follows:

"The man who starts something is very apt to be appointed chairman of a committee of the State Academy on preservation of natural conditions. Such a committee was authorized at one counsel meeting in June, and I am asking you if you will be willing to serve as its chairman."

Dr. Cooper suggested that there should be six members, evenly divided between plant and animal fields with two from the farm campus, two from the main campus, and two from outside. On August 1, 1937 Dr. Wilcox responded to the letter from Dr. Cooper by saying,

"When I prepared my paper this spring for the Academy of Science, I had no idea that you were about to be nominated for the presidency. Consequently, I was hoping that you would be appointed chairman of any committee which might be appointed. I was much more interested in starting the ball rolling again than I was in taking on an additional task. My qualifications are probably confined to an interest in the project, for I know very little about ecology."

Within the next few years the Academy, with the aid especially of Drs. Cooper, J. W. Buchta, and L. M. Gould, was able to obtain the donation of sufficient funds

Cedar Bog Lake. 1966.
Aerial view of Cedar Creek and Cedar Bog Lake. 1947.
from about 25 members so that by 1940 the Academy had purchased or had made arrangements to purchase important parts of the Cedar Creek area. In the following year the Committee for Preservation of Natural Conditions raised a large sum of money for the acquisition of more parcels of land. Dean Buchta and Dr. Cooper were very much involved in the fund raising. According to Dr. Cooper, "At the beginning of things Dr. Buchta, who was President of the Academy, proposed to me that we hold up Campus Club members as they came from lunch, and make them promise to contribute $25.00 each. We even landed Middlebrook!" Mr. Middlebrook was both Secretary of the Board of Regents and Comptroller of the University at that time.

Before proceeding further with an account of additional land acquisition and program development it is fitting that we pause to pay tribute to a truly extraordinary and memorable person, Cora Alta Corniea (Mrs. Albert Corniea). What will be said about her outstanding and unselfish contributions is taken, often verbatim, from the writings of Meribeth J. Mitchell (1960) and Grace Lee Nute (1961). According to Grace Nute if only one person could be held responsible for beginning the crusade to save Cedar Bog that individual would be Cora Corniea. She says that from the 1930’s through the 1940’s and for most of the 1950’s Mrs. Corniea was either buying land herself, paying taxes on it, or holding it until a permanent organization for preserving it in the public interest could be formed. She also visited farmers and their wives who owned the boglands, telling them of her plans and sometimes inducing them to give their land. She also tried to interest scientists, scientific organizations, professors and deans of the University of Minnesota and others to move in the direction of public or semi-public ownership.

Meribeth Mitchell added more to the tribute paid to Cora Corniea. She recalls that both she and her husband were charter members of both the Minnesota Bird Club and the Natural History Society of Minnesota. In the early years of the Society she was particularly active in recruiting new members. Many people laughingly recounted that they first joined literally in self-defense, so ardent was her zeal for promoting the infant organization.

Cora Corniea first learned of the Cedar Creek Natural History Area in 1937 about the same time that Dr. Cooper had called the attention of the Academy Committee on the Preservation of Natural Conditions to the desirability of acquiring a portion of the area. She purchased an 80 acre tract on March 25, 1937 from the Louis Peterson estate. According to Meribeth Mitchell’s account Mrs. Corniea learned that certain members of the Minnesota Academy of Science were also interested in such a project. So, during the summer of 1937, she invited the membership out to her cabin in order that they might see the area personally and then be persuaded to support the Academy’s desire to save the region. This was one of many groups and individuals she entertained to interest them in the project. In 1939 she made the first of many subsequent additional purchases of land. She studied tax delinquent lists and prevailed upon County Auditors of both Isanti and Anoka Counties to notify her when land in which she might be interested became available. A search through the records reveals that she personally bought parcels of land totaling about 600 acres. In 1940 she was made a member of the Academy Committee for the Preservation of Natural Conditions chaired by Arthur N. Wilcox.

In 1939 the Academy Committee published a report entitled “Further progress in the search for natural history areas in Minnesota” in volume 7 of the Academy
Proceedings. This committee consisted of A. N. Wilcox, chairman, R. C. Donovan, W. J. Breckenridge, T. B. Magrath, H. E. Stork and Gustav Swanson. They recommended a legislative act to establish Nerstrand Woods State Park, location of a natural history area at Itasca State Park, and a detailed investigation of Cedar Creek Bog. They expressed their views regarding Cedar Creek further by saying that during the coming year special efforts should be made to preserve the area. The report also stated that at the last meeting of the Academy the committee recommended the preservation of 240 acres in the area known as Cedar Creek Bog, and that certain public-spirited owners of tracts in the area have expressed willingness to bequeath their parcels in order to help establish this natural history refuge.

On March 25, 1940 an important letter was sent to Guy Stanton Ford, President of the University by Dr. Wilcox.

"Dr. O.T. Walter of Macalester College, who is President of the Minnesota Academy of Science, and I would like to discuss with you the question of the desirability of University ownership of a tract of land which we believe should be preserved for scientific and educational purposes, assuming that the University would be presented with the tract."

They went on to describe the interest of the Academy in preserving natural areas and the desirable features of Cedar Creek.

The following account of an additional important series of events which made possible the preservation and development of the Cedar Creek Natural History Area is taken from an article by Dr. Wilcox entitled "The Development of the Cedar Creek Natural History Area," which was published in 1950 in volume 18 of the Minnesota Academy of Science.

The purpose for which this land was desired seemed to justify and require a tax-free status. It was concluded that the University of Minnesota would be the most suitable public agency to preserve the area and administer it wisely for its intended uses. The University Board of Regents gave the proposal broached by Dr. Wilcox favorable consideration on April 12, 1940. The negotiation of a formal agreement with the University was furthered by the generous help of Attorney Clark Keyes, of Minneapolis, who contributed his services as counsel. Dr. Wilcox
consulted frequently with Mr. Fred B. Snyder, Chairman of the Board of Regents, as he did with the officers and trustees of the Academy. On December 11, 1942 the agreement between the Academy and the University was executed, providing for the conveyance of lands and the establishment and administration of the Cedar Creek Forest, as it was designated officially at that time. The full text of the agreement along with some pertinent correspondence will be found in Appendix I. It contained the following provisions as summarized by Dr. Wilcox. It provided that certain lands had been or would be transferred to the Regents, who, in turn, would keep and preserve them as far as possible in the natural conditions as a refuge for the indigenous plant and animal life; would administer the area so as to encourage its wise use for scientific and educational purposes, particularly for natural history studies; would permit the Academy to cooperate in fostering and carrying out such studies, and under reasonable regulation would keep the area accessible to qualified persons, such access and use not being limited to persons having an official connection with the University. The University also agreed to set up a committee representing various fields of natural history to have the care and supervision of the Forest and its uses. In this connection it was the desire of the Academy that the administration of the Forest should represent a broad point of view rather than that of a single department.

Dr. Wilcox went on to say that the first 40-acre tract was bought from Frank E. Swanson by Mrs. Corneia and she was repaid with funds raised by subscription from members of the Academy and that as of his writing in 1950 a total area of 580 acres had been deeded to the University. As he pointed out in a footnote the area increased to 620 acres just before the publication of his article. Of these tracts 80 acres were deeded directly to the University by Dr. and Mrs. Corneia and 50 acres by Mr. and Mrs. Glenn A. Carpenter, both gifts with life-estate reservations. Several tracts deeded to the University with a like provision were designated as Memorials. The forty-acre Frank E. Swanson tract was not actually acquired until the owner had died and a bronze memorial plaque was placed on the property by the Academy at the request of the family. Another 40 acres was given up as a memorial to Charles Bunn of St. Paul through gifts from his daughter, and 130 acres were given by Dr. and Mrs. Donald Lawrence. In March 1950, Dr. H. E. Essex, President of the Academy received the following letter from Dr. Lawrence:

"In July 1947 Mrs. Lawrence and I purchased a tract of 160 acres of land adjoining the Cedar Creek Forest in Anoka County. It is our desire to present now the portion of our land (amounting to about 130 acres) which lies north of the County road, to the Minnesota Academy of Science for inclusion in the Cedar Creek Forest."

He expressed reason for this desire and said,

"We present this land as a living memorial to my father, William Charlton Lawrence (1872-1945) who was a resident of Portland, Oregon."

The list of tracts acquired up to and including 1970 are presented in Appendix II. A letter from Dr. Wilcox to President Morrill dated April 12, 1951 is the first reference to the gift of land by the Natural History Society. Dr. Wilcox said,

"The members of the committee to administer Cedar Creek Forest have considered the proposed gift by the Natural History Society the University of a tract of forty acres to be included in the Forest under the terms of the agreement between the University and the Minnesota Academy of Science."
There followed a detailed legal description of the tract and the statement that committee recommends that the gift be accepted, and that the inteest and generosity of the Natural History Society are deeply appreciated. One correction is needed because the tract indicated as a gift from Cora Cornia on April 14, 1951 actually was the one deeded to the University of Minnesota by the Natural History Society, and according to its President, Dr. Clayton D. Rudd, the receipt of this gift was not acknowledged by the University. When this oversight was called to Mr. Middlebrook’s attention he wrote the following letter to Dr. Rudd as follows:

"Today I had a letter from Dr. W. J. Breckenridge, Director of the Museum of Natural History, in which he told me that the Natural History Society had never received an acknowledgment of their gift to the University of the forty-acre tract now incorporated in the Cedar Creek Forest."

He said further,

"It hardly seems possible, but when I looked up my file and found that on May 17, 1951 I wrote to Professor A. N. Wilcox, the Chairman of the Minnesota Academy of Sciences as follows:

The Board of Regents at its meeting on April 13, 1951 voted to accept with appreciation the gift of the Natural History Society to the University of a tract of 40 acres in the Cedar Creek Forest, subject to examination by the University Business Office. This examination has been completed and may I on behalf of the Regents express to the Society not only appreciation but the hope that this addition will aid materially to the effectiveness of the Forest for educational purpose."

According to Dr. Lawrence, who had called this situation to the attention of Vernon Ausen, Real Estate Coordinator for the University, Dr. Rudd was to receive a belated acknowledgment of the gift from President C. Peter Magrath, 31 years after the fact.

The next step was to arrange for the administration procedures required by the provisions of the agreement between the Minnesota Academy of Science and the
University. Action was proceeded by correspondence among a number of interested persons. On March 24, 1945 Dr. Wilcox wrote to President Walter C. Coffey and stated that administration by a

". . . committee directly responsible to the Dean of the Graduate School would be an arrangement very satisfactory to the Academy and that the Academy of Science has solicited the donations of land and money for the Cedar Creek Forest and has undertaken to maintain a continuing interest in the project. It would seem appropriate for the University to invite the Academy to participate directly in the program, perhaps by setting up an advisory committee to meet with the University Committee and cooperate with it in performing most of its functions."

Dr. Wilcox suggested some of the advantages for such an arrangement:

"It would strengthen the planning, . . . give evidence of the University's desire to cooperate with other institutions rather than to dominate, . . . encourage closer association and foster mutual respect between persons associated with the several institutions, . . . stimulate wide public interest and pride in one of the University's activities, and . . . give added weight to applications for financial support from foundations or other agencies. I am sure that the Academy could select, or nominate for the Regent's approval . . . a committee of non-university members who would cooperate very creditably with a University committee."

A few days later President Coffey wrote to Dean Henry Schmitz, Dean of the College of Agriculture, Forestry and Home Economics, with the request that he make suggestions relative to the kind of committee and its personnel because of Schmitz's experience in administering the Itasca Forestry and Biological Station. On April 24, 1945 Dr. Schmitz responded by saying in part that ultimately a single individual should be held responsible for the administration of the property, but not now. He stated further that he agreed with a suggestion made by Dr. Wilcox that the Academy be asked to appoint a committee of three to work with the University Committee. On May 21, 1945 Dean Blegen replied to correspondence he had had with the President by saying that he accepted a suggestion made by Dr. Schmitz that personnel of the committee should be Wilcox as chairman and that Drs. Abbe and Minnich should be other members with himself as an ex-officio member. According to Dr. Wilcox in May of 1945 President Walter C. Coffey appointed Professor Arthur N. Wilcox, chairman, Professor Ernst Abbe (Botany), Dwight E. Minnich (Zoology), and the Dean of the Graduate School, Theodore C. Blegen, ex-officio to serve as a committee in the administration of the Cedar Creek Forest. It was the President's judgment that the administration ought to be under the Dean of the Graduate School who could represent the University as a whole.

The following year President J. E. Morrill invited the Academy to select an advisory committee of three to advise the University committee in the administration of the forest and its uses. The Academy decided that its members would serve first for one, two and three year terms and thereafter for three year terms, and that members of the University staff would not serve on the Academy committee because they already were represented on the overall Advisory Committee. The first Academy representatives were selected on April 19, 1947. They were Professor O. T. Walter of Macalester College, the Reverend Adelard Thuente of St. John's University, and Professor Harvey Stork, Carleton College.

In a letter from President Morrill to Dr. John W. Moore, Secretary-Treasurer of the Academy on April 14, 1947 the President thanked him for forwarding the
First Advisory Committee Members.

University Representatives—

Arthur N. Wilcox, Chairman. 1946.
Ernst Abbe, Botany. 1960
Theodore Blegen, Dean of the Graduate School, ex-officio. 1959.

Minnesota Academy of Science Representatives.

O.T. Walter, Macalester College. 1963.
Harvey Stork, Carleton College. 1959.
Rev. Adelard Thuente, St. John’s University. 1959.

names of the persons selected—

"to consult with the University Committee on the formation of policies and the encouragement of the best and wisest uses of Cedar Creek Forest as an area to be used for scientific and educational purposes in the field of natural history."

Dr. Wilcox also pointed out that one of the first acts of the combined committee was to request the Graduate School for a grant of $400.00 for an aerial survey, which was then carried out on the direction of Dr. Donald Lawrence. The Forest and its surrounding area, about 2 by 3 miles, were photographed on June 19, 1947, by Mark Hurd Aerial Surveys. Forty-eight photographs were made on a scale of approximately 12 inches to the mile, providing complete stereo coverage. From these photographs a large mosaic photo-map was prepared. Later, under another grant, the committee had the map copied and employed an experienced cartographer to draw in the legend, scale and a grid showing the approximate boundaries of all 40 acre tracts in the general area. Because of some difficulties in establishing
section corners the grid lines were recognized as only approximately the legal boundaries. Nevertheless, a half-tone plate was made for printing copies intended just as working maps for visitors and field use.

During June of 1947 a foreman’s shed was moved to the Cedar Creek Forest from the Rosemount Research Center to serve as headquarters and as a storage place for equipment and tools. The Graduate School also provided funds to recondition the cabin, and along with gifts from the University Inventory Department made it possible to provide simple furnishings and essential tools. The cabin was equipped so that two persons could use it overnight, winter or summer.

It became obvious to the Advisory Committee that a few regulations for use of the area were very necessary. Persons wishing to visit the area were required to obtain permits in advance. These permits were issued by the Chairman of the Committee to individuals for their own use, or to teachers or leaders who were responsible for classes or other groups. For visits for observation only permits could be obtained either from the Chairman or the Museum of Natural History. Collecting was to be prohibited except when approved in advance, and users were advised about necessary precautions against fire, defacement, and disturbance, including the disturbance of persons who held life-estate reservations in portions of the area.

Research projects which would involve collecting, experimentation, or other disturbance of natural conditions could be carried out only after application to and approval by the Committee. It was recommended that maps, records of surveys and research studies should be filed with the Committee for preservation in the library of the Museum of Natural History, which was designated at that time as the official repository for records concerning the Forest.

In his article in the Academy Proceedings referred to above, Dr. Wilcox also had this to say:

“Although the Forest is, in general, intended for observation rather than experimentation, it is recognized that carefully controlled experimentation and collecting are essential for some research uses. Furthermore, although access by the public or by hunters or collectors would tend to deplete the Forest of many of its natural values, access for authorized use and for protection, such as fire control, needs to be assured.”

Thus it is evident that Dr. Wilcox and his Committee were well aware of the problems to be faced in furthering the use and management of the Forest. As time went on the regulations have been revised a number of times on the recommendation of subcommittees assigned this task by the Advisory Committee. Some of the significant changes will be presented in the management sections of this historical account.

According to Dr. Lawrence, in a letter to Dr. Alton A. Lindsey dated October 31, 1981, Dr. Murray Buell and his wife Helen did the first comprehensive work on Cedar Creek Bog and Cedar Bog Lake. But he points out that their first paper, “Surface level fluctuations in Cedar Creek Bog, Minnesota,” was proceeded by one year by Ray Lindeman’s first publication. Dr. Buell had established a transect in 1934 in order to make an elevation survey and marked trees with railroad spikes, and at this writing the one marking the northern end of the transect is still visible, as are also two adjacent ones. Dr. Lindeman and later workers used the same transect for other purposes. Dr. Lawrence went on to say that Russel Artist was actually the first one to do serious work at Cedar Creek Bog. He, one of Dr. Cooper’s
students, collected cores for pollen analysis and included Cedar Creek Bog samples as part of a broad study of bog deposits scattered over the Anoka sand plain.

In an article published in 1980 in volume 31 of the Naturalist Dr. Lindsey payed elegant tribute to Dr. Ray Lindeman. The article was entitled “The Ecological Way.” Most of what follows has been extracted from Dr. Lindsey’s account of Ray Lindeman’s problems and accomplishments. Because Dr. Lindeman was blind in one eye he could not study air-photos stereoscopically. However, the power of his mind was not hindered by his physical incapabilities which were considerable. His health declined so much that his wife Eleanor had to help him regularly in field work much of which called for rowing, dredging, towing and dipping. He was so intense that had it not been for his dear wife he wouldn’t bother to take time to go

Murray and Helen Buell. 1940.
home to supper. This I know from personal observation.

The Lindeman legacy, beyond his commitment to science, is in the form of six significant papers. In the last one is what Edward Kormondy called, "The most significant formulation in the development of modern ecology." He was referring to the "classical paper of Lindeman" as it has often been called, entitled "The Trophic-Dynamic Concept in Ecology." This paper was at first rejected by the editors of Ecology because two leading limnologists who reviewed it said that it made too many assumptions for publication. The paper was published in Ecology in 1942 following the urging of such people as Drs. Cooper, Lawrence and G. Evelyn Hutchison, members of the Editorial Board, and with the hearty approval of Dr. Thomas Park, the Zoological Editor of Ecology. Ray served as a teaching assistant with me and frequently used me as a sounding board. In a letter I received shortly before he died in 1942 Ray thanked me for reminding him to "keep one toe on the ground." For an excellent and much more complete account of the importance of Ray Lindeman's work the reader is referred to an article published in Science (1977) by Dr. R. E. Cook entitled, "Raymond Lindeman and the Trophic-Dynamic Concept in Ecology". In this article the author includes considerable correspondence regarding the original rejection and subsequent acceptance of the "classical paper of Lindeman".
Old board walk leading to Cedar Bog Lake. 1953.

Cedar Bog Lake, 1954.
Area Management and Program Development (1948-1957)

Among the early investigations carried on at the Cedar Creek Natural History Area were studies on the bird populations by Byron Harrell in 1948, and the ecology of reptiles and amphibians by Richard Straw in 1949. Also in 1949 three new research projects were proposed: Breeding bird populations, Walter Breckenridge; life history study of the red-backed mouse, Harvey Gunderson; and permission to trap birds, Meribeth Mitchell.

In 1952 Dr. John W. Moore proposed to prepare a catalogue of the flora of the area and said that some 125 species of flowering plants and ferns had been collected and deposited in the Botany Department herbarium. That same year a Botany class Experimental Ecology taught by Dr. Lawrence had seven all-day field trips from April to June; they used the Lawrence's new cabin as a lab. Also, that year the waterfowl use of the area was investigated by Elmer Norberg, a student of Dr. William Marshall. Richard L. Pierce proposed to prepare a map showing vegetation history in the area. He included a very detailed description of what he intended to do. There were 22 items some of which were the following: Interviews with owners to determine when tree cutting was done, first and last years plowed, kind of crops grown, types of fertilizer used, was lake stocked with fish and ice cut, plants introduced, etc. A very ambitious program to say the least for a M.S. Thesis.

In May of 1952 Dr. Wilcox wrote a long letter to University President Morrill in which he outlined the need for additional land purchases, particularly a 130 acre tract owned by Mrs. Cornelia. On May 14, Mr. Middlebrook had this to say to President Morrill:

"Very apparently Cedar Creek Forest has served desirable research and instructional purposes. I am therefore, as a matter of policy, quite in agreement with your feeling that the additional land should be acquired."

He went on to outline the procedures that had to be followed in the acquisition of land by the University. By this time the members of the Advisory Committee were Dean Blegen, ex-officio, Ernst Abbe, Dwight Minnich; O. T. Walter, Max Partch and Paul Rudolph for the Academy and A. N. Wilcox, chairman. Max Partch was a professor at St. Cloud State College, and Paul Rudolph was on the staff of the Lake States Forest Experiment Station.

On July 8, 1952 Dean Blegen wrote a very important letter to Dr. Wilcox. In it he said:

"There seems to be at least a reasonable chance that we might, through the Greater University Fund, proceed with a large plan for the Cedar Creek Forest, looking forward toward a gift from Mrs. Fleischmann.

I have had some conversations with Mr. Wenberg on this subject, and I am inclined to think that the time has come for us to prepare a fairly full statement, persuasive in content, about the Cedar Creek Forest, leading to an estimate of costs involved in acquiring all the additional land that we need and want plus all the collateral expenses that might be incurred in doing whatever is necessary. I realize that this sounds a bit big and also overly ambitious. I do not want to set up a specific sum of money, with the idea of them trying to find ways of spending it. On the other hand I think we now should try to arrive at the probable cost of the 600 or more acres that should be bought and also take into account anything in the way of suitable installations that would have the approval of yourself and the Committee."
He also said that he had in his hands considerable correspondence between Mr. Wenberg and Col. Schutte. Stanley Wenberg was the first Director of the Greater University Fund for a short time before he became Assistant to President Morrill and was then succeeded by Robert Provost as Director. Col. Clarence Schutte was an outstanding Minnesota football player, a very loyal and active alumnus of the University, and above all this, was a close personal friend of Mr. and Mrs. Max Fleischmann and Stanley Wenberg.

It must have been in late 1952 or 1953 when the following event took place as stated in the application sent to the Max C. Fleischmann Foundation of Nevada the following year.

"It is significant that when the Greater University Fund was established and the first call was issued for projects deserving its attention, nine departments of the University joined in requesting the completion of Cedar Creek Forest. No other project that has come before the Fund has ever had such broad support; regrettably the amount needed was too great to be provided by any available resources. The request nevertheless demonstrates how important this project, which was initiated by the Academy of Science, had already become to the University itself."

On January 20, 1954 Dr. Wilcox wrote to Mr. Lunden saying,

"In cooperation with the Greater University Fund and the Graduate School, the Committee to Administer the Cedar Creek Forest has been preparing an application to a philanthropic foundation for a financial grant to the Regents of the University for the purpose of buying needed land, constructing a headquarters-laboratory building and establishing an endowment to provide support on a permanent basis. The amount proposed is nearly one-half million dollars."

On February 1 Mr. Lunden replied,

"I have just received from President Morrill's office advice that he has given administrative approval for the submission of an application to a philanthropic foundation for a financial grant for the further development of Cedar Creek Forest."

And on February 3, 1954 Stanley Wenberg told Col. Schutte,

"We still plan of course, to send an advanced copy to you so that should you find an opportunity to discuss it with Mrs. Fleischmann you will have the information in hand."

On January 12, 1954 Stanley Wenberg had written to Robert Provost and Dr. Wilcox to inform them,

"I talked to Mr. Schutte on the phone, last week, and he has agreed to talk with Mrs. Fleischmann about the project independent of consideration by the Board itself."

Thus it is clear that Col. Schutte played an important intermediary role in the negotiations as will be much more evident as time goes on.

On March 8, 1954 Mr. Wenberg wrote this to Dr. Wilcox,

"Now that the Cedar Creek Forest application has been pretty well jelled, I want to express my admiration for the enormous care and thoroughness with which you approached the design and preparation of this. It is a splendid document that we ought to continue to use until we nail down these funds."

The splendid document which he referred to was the application made to the Max
C. Fleischmann Foundation of Nevada which is presented in full in Appendix III. President Morrill prepared a letter which was sent to Mr. Lester D. Summerville, Chairman of the Foundation, to accompany the grant application endorsing the application of a grant to make possible the proper development of Cedar Creek Forest.

In this letter, dated April 28, 1954, President Morrill had this to say, “This living laboratory of natural history was selected for the purpose by the Minnesota Academy of Science, entrusted to ownership and administration by the University and other colleges.” He said further, “I have been impressed, not only by the natural resources of this area for studies in this generation and later, but also by the approach that is exemplified in this project. Here we have coordination of the efforts of scholars, with a common and central goal—the understanding of many and complex bonds that hold together a complete society of man and animals. I understand that this approach is unique in this country, and this strengthens my conviction that the Cedar Creek Forest project is national in its value and significance.”

He states more, “In this common undertaking, investigators and students with various backgrounds and from different places will work together. What they do may be expected to have far-reaching effects in the evaluation and broadening of more competent scientists as well as in the enlargement of understanding of natural history.”

On April 5, 1954 Robert Provost, Director of the Greater University Fund wrote to Warner Clapp, Manager of the University Photo Laboratory and thanked him profusely for the part his group played in making the application to the foundation for the original $250,000 grant. He said, “It was essentially Wally Zambino’s idea of make-up that provided the original theme for this unusual and highly successful presentation.”

On May 22, 1954 Dr. Wilcox reported to Mr. Wenberg on a meeting held in the Campus Club. Those present were Col. Clarence Schutte, Dean Blegen, Robert Provost, Professors Minnich and William Marshall, and Paul Rudolph representing the Academy. Col. Schutte said that Mrs. Fleischmann had been very favorably impressed with our application. He reported her saying that if she and her late husband’s friends had tried to develop a project specifically to suit Mr. Fleischmann’s interests and standards, they could not have done as well. He also suggested how important it would be to have her visit the area but that steps should be taken to acquire the more important tracts of land and construction of the building. He also said that if Mrs. Fleischmann should be able within two years to see tangible and satisfactory results it is possible that her interest might increase.

In June of 1954 Mr. Lunden received the following message from Mrs. Fleischmann, “In answer to the application to the trustees of the Max C. Fleischmann Foundation of Nevada for a grant, through the Greater University Fund to the Regents of the University of Minnesota for Cedar Creek Forest, we are pleased to inform you that, during the last regular meeting of the foundation trustees, a grant of $250,000.00 was voted.”

She said further,
"We wish to congratulate the University of Minnesota and the Minnesota Academy of Sciences for their effort to provide greater understanding and more effective education in natural history."

Of the $250,000.00 granted $165,000.00 was to be used for land acquisition, $75,000.00 for the construction of a headquarters laboratory building, and $10,000.00 for current maintenance expenses. The Foundation did not approve the granting of an endowment fund. On July 7, 1954 Stanley Wenberg received a letter from Col. Schutte in which he said that Mrs. Fleischmann had told him what the Foundation had done and went on to say,

"It is the largest grant by the Foundation so far, and you have no idea what a thrill it is to me to help in my small way, the University Minnesota."

He also mentioned that he might be back for the 30th anniversary of the dedication of Memorial Stadium where he had played football.

On July 14 Dr. Wilcox wrote to Dr. Marshall, who was teaching at Lake Itasca, saying,

"Dean Blegen and I agree that it would be very desirable for you to see Mrs. Fleischmann and Col. Schutte when you are in the West—some words of appreciation from you as a faculty member and interested biologist, telling how pleased everyone is at this grant, and what some of its possibilities are, would help fortify her interest in it."

In October there was a conference between Clarence Schutte, Stan Wenberg and Art Wilcox during which Col. Schutte explained that his project had become a favorite of Mrs. Fleischmann and that prospects for further grants would be best during her lifetime. He said further that two of the Trustees might visit the area in the spring.

On November 5, 1954 there was an important letter from Dean Blegen to President Morrill in which a number of recommendations were made because of the need that he saw for a less informal basis for Cedar Creek operations. The most important items are given below: 1) The University authorize the Graduate School to assume responsibility for the Administration of the Cedar Creek Forest. 2) Professor A. N. Wilcox be designated Director of Cedar Creek Forest; and 3) The Dean of the Graduate School be authorized to appoint a University faculty committee, of which he would be an ex-officio member, advising the Director with respect to the policies centering in the Administration of the Forest. He also suggested that it would be prudent to have some other faculty member as chairman of the Advisory Committee, and that its membership should include members of the Academy. A few weeks later President Morrill responded and approved the recommendations presented to him by Dean Blegen. In late October Leonard A. Ford from Mankato State College had been informed of the administrative arrangement given above and reported that a mail ballot sent to the Academy members gave unanimous approval of the arrangement on December 2, 1954.

The Advisory Committee received a further report from Dean Blegen in connection with the reorganization and new plans and program of the Cedar Creek Forest on January 14, 1955. He pointed out that President Morrill had recently authorized him to appoint a new University faculty committee to serve in advisory capacity to the Director, Professor A. N. Wilcox, with respect to the policies centering in the administration of the Forest. The faculty Advisory Committee members whom he appointed were Professors D. E. Minnich, chairman, W. J. Brecken-
ridge, J. J. Christensen, A. O. Dahl, C. E. Mickel, F. H. Kaufert, A. N. Wilcox as Secretary, and following a directive from the President himself as ex-officio member.

At the same time that the central committee was being established Dean Blegen said that he thought it desirable to appoint a series of Special Consultant Groups; one for Ecology, one for Wildlife and one for Protection. He asked A. C. Hodson to serve as chairman of the Group for Ecology along with Samuel Eddy, Donald Lawrence and one member from outside University circles, Professor Harvey Stork of Carleton College. For the Consultant Group on Wildlife he asked Professor William Marshall to take the chairmanship with Professor James Beer, Curator of Ornithology Prof. Dwain Warner, and Laurits Krefting, regional biologist for the Department of Interior as an outside member. For the Consultant Group on Protection he appointed Donald Duncan chairman and Clyde Christensen and Alexander C. Hodson as additional members. At that time the advisory group from the Academy included Drs. Walter Kenyon and Max Parme, and Paul Rudolph. A short time later Dr. Arthur Nash replaced Dr. Kenyon on the committee.

Members of the Advisory Committee in 1955: Left to Right—Dahl, Botany; Rudolph, Lake State Forest Experiment Station; Breckenridge, Director James Ford Bell Museum of Natural History; Dean Blegen, Graduate School; Minnich, Chairman Zoology; Vice President Wenberg; Wilcox, Director of CCNHA; Mickel, Entomology; Christensen, Plant Pathology; and Kaufert, Forestry.

Missing—O. T. Walter, Macalester College and Harvey Stork, Carleton College.
On February 1, the Advisory Committee met to receive the announcement that the Regents had appointed a building committee and the selection of an architect. The committee consisted of an Advisory Architect, Winston Close, the Supervising Engineer Roy V. Lund, Professors A. O. Dahl, W. H. Marshall, A. N. Wilcox, and Professor O. T. Walter representing the Academy. Dr. Marshall was President of the Academy that year. Mr. Middlebrook invited Mr. Harold Scholberg of the Minnesota Mining and Manufacturing Company as a special consultant. Several meetings of the Advisory Committee were held in short order with the primary purpose of dealing with urgency for selecting a suitable site for the Headquarters-Laboratory building. At one of these meetings Dr. C. E. Mickel was appointed vice-chairman because Dr. Minnich would be away during the summer.

In a letter dated February 25, 1955 Stanley Wenberg had this to say about items dealing with a request for additional funds, the grant application and any further requests:

"The note we struck was a sentimental one. Mrs. Fleischmann saw in the Cedar Creek Forest something that she felt would have been very dear to her husband. Any appearance of failure on our part (in her mind) to reflect this keen sentimental interest of hers will cause the project to dim in its glow for her. This dimming will have the effect of cutting us off from further grants."

He said further:

"She has no scientific background herself, nor is she particularly interested in the out of doors. But the design of this project rang a bell with her as the kind of thing her husband, Max would have loved. He went on to point out how important it is to not have further delay in building and we can no longer use the excuse for not building that we cannot obtain the land on which we want to put the building."

In a letter to the files Stanley Wenberg said,"

"I called Clarence Schutte to tell him about Professor Wilcox's plan to be in the Los Angeles area late in April. He was a trifle sarcastic about the call, not having heard a thing from us since the grant was made, other than our messages of acknowledgment."

He went on to say that before any further plans for another application could be made it was especially important to develop closer contact with Mrs. Fleischmann. He then said:

"I think that it is clear that we are going to have to do more reporting and have more detail in an application because of the full lapse of a year since we have made any contact with the Foundation than one might otherwise have had to do."

He suggested further that:

"A number of buildings now given to Nevada will bear the Fleischmann name. This element of policy having been determined, it seems that we should at once decide that the laboratory building should be known as the Fleischmann Laboratories. Should the additional grant be authorized, we can probably make a good case for naming the entire project the Fleischmann Natural History Preserve. This is something the executive committee should consider seriously."

Wenberg's reference to an additional grant was the application for an endowment fund which was being prepared. In fact, on April 18, 1955 Mr. Middlebrook wrote
to Dean Blegen stating that the Board of Regents voted on April 15 to approve the application of a grant proposal of $283,550.00 to the Foundation for additional support for Cedar Creek.

On April 27, 1955 Dr. Wilcox visited with Mrs. Sarah Fleischmann, Mr. Julius Bergen, Secretary of the Foundation, and Mr. Clarence Schutte and reported the progress being made on the Cedar Creek project. I have extracted parts of the letter Dr. Wilcox sent to President Morrill in which he reported to the President on his conference. Mr. Schutte had been advised in advance of his intended visit to the Pacific Coast. (Dr. Wilcox was to be meeting with horticulturists at experiment stations from Washington to California.) Mr. Bergen met Dr. Wilcox at the Santa Barbara railroad station and took him to Mrs. Fleischmann’s home on the outskirts of Santa Barbara. During the informal conference at her home there was reference to a problem created by the Foundation requiring a public announcement of the intent to purchase land with funds from the grant. Dr. Wilcox pointed out that he did not wish to do this because such an announcement might cause an increase in land prices. Mrs. Fleischmann responded as though this was not the first time such an announcement had been embarrassing. She was shown some provisional sketches of the laboratory building and showed a remarkable interest and understanding of building construction. Among other things she wondered whether flat roofs were practical in Minnesota because of our heavy snow. She was shown some recent pictures that had been taken by Mr. Zambino. She commented favorably on the pictures, and remarked that our application had been the most beautiful one ever received by the Foundation.

Dr. Wilcox explained that because the need for funds in excess of the amount granted to be used to complete the physical plant, provide equipment and maintenance that the University would be requesting about $285,000.00 as an endowment fund. His hosts were entirely silent as to our prospects. Dr. Wilcox explained to them that in view of the Fleischmann Foundation’s interest in the Cedar Creek Forest project, he did not wish to approach another foundation without consulting them first. As he, Bergen and Schutte were driving to the country club Dr. Wilcox inquired as to whether Mrs. Fleischmann would be willing to consent to designation of the building as the Fleischmann Laboratory. Mr. Bergen said they would consult with her and remarked that many recipients had made such requests. Dr. Wilcox inquired whether Mr. Schutte had been a close friend of Major Fleischmann’s and perhaps a golfing companion. Mr. Bergen explained that Major Fleischmann had other golfing companions, but when Mr. Schutte had been the Santa Barbara High School football coach, he had invited Major Fleischmann to be a sort of unofficial assistant coach, sitting on the bench at all games. Before leaving Dr. Wilcox presented his hosts with some Minnesota blue cheese.

On May 13 Orville Dahl reported on University funds supporting research projects. They are listed below:

1. W. J. Breckenridge—A long term study of population fluctuations and ecological niche requirements of the birds breeding in two distinct habitats in the Cedar Creek Forest, $1,430.00.
2. Harvey Gunderson—Life history and population study of the red-backed mouse in the Cedar Creek Forest, $1,475.00.
3. Donald Lawrence—Water Table, frost table, temperature and phenology, $2,213.00.
4. R. L. Pierce—Vegetative cover types and land use history of Cedar
Creek Natural History Reservation, Anoka and Isanti Counties, Minnesota, $5,952.00.

5. F. M. Swain and N. Prokovich—Stratigraphic distribution of lipoid substances in Cedar Creek, $1,700.00.

On June 20, 1955 Dr. Wilcox wrote to Dean Macy, chairman of the All-University Honors Committee, saying:

"We would like to explore the possibility of having the building designated as the Fleischmann Laboratory for Natural History Research or of having had the Fleischmann name attached to it in some other way."

Also in June Dean Blegen invited Mrs. Martha Crone to serve on the Special Consultant Group on Wildlife and Mrs. Cornelia to serve on the Protection Group. Both were very pleased to receive the invitation. About this same time Dean Blegen and Dr. Wilcox wrote to Julius Bergen with reference to an application being submitted to the Fleischmann Foundation for an endowment, and a quite different application for a grant was submitted to NIH to support research on small rodents and their ectoparasites by Drs. Cook and Beer.

In October a number of letters were exchanged between Stanley Wenberg and Clarence Schutte. In one he said that he had been urging the Advisory Committee to have the laboratory finished by the fall of 1956. Wenberg had written to Col. Schutte to explain the lack of progress on the building. Apparently Mrs. Fleischmann was a bit disappointed in the lack of building progress. However, Mr. Wenberg did report progress to the Foundation in December. He told the Trustees that 2,404 acres had been purchased from the Fleischmann grant and that the total number of acres owned by the University was 3,154. A little later, on December 22, 1955 Mr. Wenberg wrote to Col. Schutte and explained why the University had been slow in acquiring land:

"For instance, we have not resorted to condemnation proceedings because of a somewhat delicate tax situation in the two counties involved. They are not wealthy counties, and the whole climate in the counties is advantaged by a system of individual plot purchases rather than wholesale condemnation under the right of eminent domain."

Early in January, 1956 the question of naming the laboratory came up again. Dean Blegen suggested to Mr. Wenberg that Dr. Wilcox should write to Mrs. Fleischmann and simply tell her that we are proposing to have the name used for the laboratory. Stanley Wenberg had previously written to Deans Blegen and Macy and Dr. Minnich saying:

"As you know the Board of Regents at its meeting on December 9, 1955 approved the recommendation of the University Committee on Honors to authorize the naming of the Cedar Creek Forest Laboratory building as the 'Fleischmann Laboratory' provided the name was acceptable to the Fleischmann Foundation."

There followed the suggestion that Professor Wilcox should take steps for getting approval by first approaching Mrs. Fleischmann rather than the Foundation.

It was mentioned earlier that the involvement of Stanley Wenberg in the Cedar Creek Forest project would become more evident as the history developed. His early involvement is very evident from what he said in a letter to Dr. Wilcox on April 30, 1956.

"This quarter-million grant from the Fleischmann Foundation was virtually
an 'exclusive' for the Greater University Fund, as you know. Indeed, if I had not been on a development tour of the West Coast, the initial contact that brought about the Fleischmann gift would never have developed, I am certain, because of my knowledge there has not been a nickel of Fleischmann money granted east of Nevada with the exception of the Minnesota project."

On June 21, Dr. Wilcox submitted a report to the Foundation Trustees and Officers. I have extracted pertinent items from this report. The 1954 grant was allocated as follows: $165,000.00 for the purchase of land, $75,000.00 for the creation of a head-quarters-laboratory building and $10,000.00 for the first year's cost of operation. At this time 2,645 acres had been purchased at a cost of $83,819.56 and earnest money had been paid on an additional 240 acres. The building plans and specifications have been completed with bids due on July 2. Because the cost estimate exceeded what had been expected it was necessary to eliminate an apartment or dwelling for a resident supervisor. This left an office, meeting room, laboratories, an apartment for visiting scientists, and dormitory space to accommodate about 16 students. He stated further that it was estimated that the building would be completed about December 1, 1956.

On September 24, 1956 the Consultant Group on Ecology discussed a request made a few weeks earlier by Drs. E. F. Cook and James Beer to use certain areas for the purpose of collecting three species of mice. In approving the request they considered the following:

1. The need for and the desirability of using Cedar Creek as a study area for these purposes.
2. The ecological consequences of removing mice in quantity from the area.
3. The establishment of buffer areas between the localities to be trapped and the area being used by Mr. Gunderson.
4. The designation of certain areas in which no collecting of mice would be permitted.

They were not to trap in what was referred to as the central area including Cedar Creek Bog and in a 40 acre tract owned by Dr. Lawrence.

In a letter dated October 1, 1956 Dean Macy wrote to President Morrill saying:

"At a meeting on University Honors held on September 27, the Committee instructed me to enter into the record the fact that Mrs. Max Fleischmann did not want to have the new laboratory-headquarters building at the Cedar Creek Forest named The Fleischmann Laboratory for Natural History Research."

On August 15, 1956 there was an important letter from Mr. T. L. O'Hearn to Dr. Wilcox. In it he said:

"Thursday, August 9 when we closed the deal with Mr. Alvar H. Peterson, he requested us to convey to you his earnest desire to be considered as possible caretaker for the new laboratory building now being built on the Cedar Creek Forest Area."

He went on to say:

"Mr. Peterson is a young active man about 35 years old. He is by all means the most active and alert farmer we have met in the area and I have no hesitation in recommending Mr. Peterson to you for this position."

On December 3 Mr. Wenberg sent a confidential memorandum to Dean Blewen which he prefaced by saying that he did not want to seem to be disrespectful of the
Advisory Committee but there were some things that needed to be done. In addition to the need for more work to obtain funds he said:

"I am going to boldly ask you if you think in this matter of physical maintenance and upkeep of the properties, this piece of land and its facilities should be brought within the operational and maintenance of purview of the Institute of Agriculture management of Branch Stations."

This was the first time a separation of physical plant operations and the teaching and research activities had been suggested. Mr. Wenberg also questioned whether Dr. Wilcox should continue as a part time Director. He said:

"Also, very candidly, I think we have to ask ourselves if Professor Wilcox is the man from every consideration to be director of this project. Experience in the past two years raises no question in my mind whatsoever about his scientific competence but it does raise serious questions about whether or not he is the one to carry administrative responsibility for the project."

In fairness to Mr. Wenberg it should be added that the Advisory Committee had that same concern, and Dean Blegen also raised this question a little later.

As 1957 rolled along the most exciting event was the dedication of the laboratory and there was considerable discussion about the need for additional funding, and some anxiety about the impact of the possible development of a major Air Force Base near Cedar Creek. Mr. Wenberg called Dr. Wilcox's attention to the the impact on land purchases that this development might have.

On May 9, 1957 the Ecology Group, now referred to as the Subcommittee on Ecology proposed a tentative plan of operation which is given in part below:

1. Regular meetings of a single Technical Advisory Committee which would provide for the following:
   a. Preservation of the greatest variety of environmental conditions and biotic communities.
   b. Active program needed for protection from disturbance.
   c. Procedure should be established for arbitrating the conflicts which might result between research activities and the program for protection; to include zoning for experimentation and removal of
samples, and a marking system to warn visitors of the need to keep out of sites where research is in progress.

2. Regular meetings of the Administrative Committee to consider proposals submitted for research projects and the appointment of committees to work out—
   a. Long range plans for the administration and operation of the laboratory.
   b. Qualifications of a resident scientist-custodian.
   c. Policy on access and maintenance of roads, and recreational use.
   d. List of facilities available and preparation of a popular booklet for publicity purpose.
   e. Plans for keeping an adequate record file in the laboratory.
   f. A number of suggestions regarding the need for a means for obtaining funds.

At a meeting the following day plans for a summer meeting of the Academy were considered along with the need for dedication ceremonies at some suitable time. The Committees felt that these activities might very appropriately be held together. It was moved that a subcommittee, including an Academy representative, be appointed to make plans for the dedication. A few days later, on May 13, Dean Blegen wrote to President Morrill with the first suggestion that it might be desirable to open up discussions with Dean Macy and Dean Fenske as to the advisability of having the fiscal and administrative management of Cedar Creek turned over to them. Also, in May, a preliminary draft of material for an application to the Max C. Fleischmann Foundation for an endowment to operate the Cedar Creek Forest project was prepared.

On June 3, A. C. Hodgson was elected Acting Vice-Chairman in the absence of Dr. Mickel who was away on an assignment in Korea. The new members of the
Advisory Committee from the Academy were Andrew Seim from Gustavus, Merle P. Meyer from the University, James Jones from Macalester and Howard Orr from St. Olaf. At this meeting mention was made of a grant of $25,000 from the Hill Family Foundation to support a research project proposed by Dr. Lawrence. On June 4, 1957 Dr. Minnich appointed an Ad Hoc committee to pass on any special arrangement in connection with research projects to be carried on during the summer months. The members of this committee were A. C. Hodson, Chairman, Mason Boudrye, recently appointed permanent Secretary of the Academy, and Drs. Duncan, Marshall and Wilcox. On June 12, in a letter to Dean Blegen, President Morrill said that he had approved a recurring grant from the President's Discretionary Fund of $3,000.00 for a utility and maintenance man which had been requested early in May. Also on June 12 I reported to Dr. Wilcox that the Ad Hoc committee set up to review research requests met on June 7 to consider Dr. Lawrence's application to use Cedar Creek for a project entitled "Some Energy Relations of Terrestrial Ecosystems." It was approved as the first experimental study to be made which involved harvesting of trees and other plants. It was recommended that tree vegetation should be sampled on the basis of individual trees rather than on a plot basis. This action was somewhat ironical because earlier Dr. Lawrence had voiced a strong objection to Drs. Cook and Beer collecting mice at Cedar Creek.

President Morrill received an important letter from Mr. Lester D. Summerfield, chairman of the Fleischmann Foundation on June 17, 1957. Among other things Mr. Summerfield had this to say:

"There is nothing in your original application of 1954 to lead us to believe that you would be unable to support the project if we made the grant of $250,000.00. In fact, in the application you stated, 'The willingness of the University of Minnesota to accept the responsibility of administering the forest and developing its resources for research provides the assurance of its dedication to scientific and educational purposes. The interest and participation of the Minnesota Academy of Science and the faculties of the University and other colleges indicates that the use of the forest will increase as its facilities are developed.'"

In this way Mr. Summerfield gave notice that the application for an endowment would not be approved.

In a letter addressed to Dean Blegen, Robert Provost and Dr. Wilcox, Stanley Wenberg had more to say about this important decision by the Foundation:

"Indeed my initial impulse was that Mrs. Fleischmann bought this project on the basis of its personal appeal to her. The project could not have moved to first base with the other Trustees of the Foundation. It was completely outside the pattern of their grants and only as we might have done a skillful follow-up job on Mrs. Fleischmann in the early years of the project could we have hoped to perpetuate her initial flash of interest, now dead, means essentially, I believe, the project is dead as far as the Foundation is concerned.""

A subcommittee for the dedication of Cedar Creek Forest Laboratory was appointed by Dr. Minnich. They were, A. C. Hodson, chairman, Dr. A. O. Dahl, Mason Boudrye, Dr. Wilcox, and Dr. Harold Peters, President of the Academy. After it was decided to combine the laboratory dedication with the annual summer meeting of the Minnesota Academy of Science to be held on September 14 and 15, 1957 a number of people were approached with an invitation to present a dedica-
tion address. The first to be invited was Dr. Paul B. Sears of Yale University but he explained that he would be in Europe at the time of the dedication. He did suggest the names of Fairfield Osborne, President of the New York Zoological Society, Dr. Richard L. Goodwin, President of the Nature Conservancy, and Dr. Stanley Cain, University of Michigan and President of the Ecological Society. It was Dr. Cain who came to deliver the address. The program included a noon luncheon with the dedication at 2:00 P.M. The speaker was introduced by Dean Theodore C. Blegen. His introduction was nothing short of elegant and is presented in full in Appendix IV. President Morrill had received a copy of Dean Blegen's introduction and had this to say about it:

"Certainly you were the right person to dedicate the Cedar Creek Forest Laboratory for the University. Your address brought a feeling for this project and an understanding of the significance which neither I or anyone else could have expressed so adequately as you did. Mr. Wenberg tells me that without exception every report he has had on the dedication day ceremonies has been a comment of praises and for this surely you deserve a great deal of credit."

Dr. Cain spoke on the topic "The Need for Natural Areas." One paragraph includes the main point of his lengthy address. It went as follows:

There is, however, a very real problem here. Although a sufficiently large area may support all forms of outdoor usage, it does not follow that all uses can go on at the same time in the same place, for some uses are directly conflicting. There must, then, be an allocation of space to the different uses, each in its appropriate place and allowance for it in some realistic relation to the demand for it. The use of private land is controlled by the owner, providing only that it does not create a public nuisance or in some way interfere with the general good. The custodian of public lands are in a tougher spot. They follow administrative policy that is sensitive to all the pressures of special and vested interests and what often may not be completely satisfactory to any interest."

In this statement Dr. Cain touched upon a problem which had received much attention by the Advisory Committee and which the Committee has had to deal with often in the past and will have to many times in the future.

Dr. Hodson had received a letter from Dr. Cooper on September 9, 1957 in response to an invitation to speak at the dedication ceremony. He said:

"I enclose a brief message of greeting that I promised for the dedication ceremony at Cedar Creek. As the time approaches I regret more and more that I am not to be there. As it has turned out, I was wise—or more probably lucky—not to accept. Recently came my Pacific dune M.S. from the Geologic Society to be made ready for the printer with the desire that it be done quickly—which is also my desire. 250 M.S. pages, with several words changed on every page to suit the whim of the editor, each change requiring careful reading of the context to determine whether it is justified. Request to eliminate some photographs, requiring renumbering throughout. It will soon be over except for galley proof, page proof, indexing, etc. Then I can get to work on some new projects."

In the message that Dr. Cooper referred to he presented most of the account of his discovery of Cedar Bog that was in his letter sent Mrs. Corneia which was quoted earlier in this document.

In September Dean Blegen named a new Advisory Committee consisting of A. C. Hodson, chairman, J. J. Christensen, W. H. Marshall, Donald Lawrence and Frank Kaufert. He also had this to say to Dean Fenske:
"Professor Minnich has asked to be relieved of the chairmanship since this is his final year in active service in the University, and I have therefore asked Professor Hodson to take over the chairmanship."

He said further that:

"1957 has been in several respects a landmark in the history of this enterprise, and I am particularly glad that we have not only succeeded in increasing our land holdings in the Forest, but also in erecting and dedicating the Cedar Creek Forest Laboratory."

These remarks quoted from a letter from Dean Blegen would seem to mark an appropriate occasion to conclude the 1948-1957 section of the history of the Cedar Creek Natural History Area.

Management and Program Development 1958-1967

Early in January, 1958 an application was made to the National Science Foundation for funds for stereographic aerial photography and contour mapping of the area at five-foot intervals, and for the purchase and installation of equipment for meteorological recording of weather data, considered the two most needed aids to Cedar Creek research. The sum of $55,800.00 was granted for these purposes. Drs. Homer T. Mantis from the Univ. Minn. Physics Department and V. E. Suomil of the University of Wisconsin served as consultants on the meteorological project.

On March 20, 1958 Dwain Warner wrote a letter to Dr. Wilcox outlining his research proposed on the application of electronic methods to wild animal field studies. Among other things he said:

"We visualize that in the near future it will be possible to have radioed into the laboratory on the campus and recorded on tape and film through every minute of the 365 days of the year numerous kinds of data on micro- and macroclimates, phenology, movements of animals both large and small, even predation and other mortality factors. Heat exchange and other aspects of total and individual energy patterns are also a part of the picture."

"The first phase of this project will be to determine which electronic devices will serve best to record and transmit the desired data. As techniques prove functional, they will be installed in the field. When devices are needed but not yet developed, the engineers and researchers in technology will undertake to develop them."

He said further:

"Certainly this is a dream, but much discussion and planning have already been done. There seems no doubt that whatever comes of this will be a step forward in establishing the bond in biotechnology to the advancement of both fields."

This statement has turned out to be even more prophetic than Dr. Warner dreamed back in 1958. Dr. Warner also wrote to Dr. Wilcox requesting the use of grassland areas in the Forest to study the ecological distribution of grassland sparrows. He stressed the need to confine their trapping and other activities to the designated non-disturbance areas and to avoid some areas scheduled to be burned.
On April 22, 1958, the Advisory Committee chairman announced the appointment of a subcommittee to make recommendations with respect to use of the area and the first action was taken on Dr. Kaufert’s previous recommendation to change the name to Cedar Creek Natural History Area. Dr. Wilcox announced at this meeting that a recurring item had been included in the University budget to provide a caretaker and that Alvar Peterson had been employed. The small subcommittee appointed were, Donald Lawrence, chairman, Merle Meyer, and Walter Breckenridge. On April 30 this year the following were requested to serve on the Operational Policy Subcommittee. They were Donald Lawrence, chairman, Mason Boudrye, William Marshall and Merle Meyer.

On May 1, 1958 Dr. Wilcox wrote a letter to Mason Boudrye, Executive Secretary of the Academy in which he said that the Advisory Committee had suggested a name change for Cedar Creek Forest some years ago. He pointed out that Dr. Frank Kaufert had suggested a change because of the confusion caused by some people considering it part of the Forestry School’s set up similar to the John H. Allison Forest at Lake Vadnais and the Cloquet Forest. In June W. T. Middlebrook said that the Board of Regents at its June 14, 1958 meeting voted on the recommendation of Mr. A. N. Wilcox, Director of the Cedar Creek Forest project of the Graduate School, and the President to approve the change of the Cedar Creek Forest to Cedar Creek Natural History Area.

This year as in earlier ones there were many exchanges of letters dealing with funds to support the operation and for the construction of additional facilities. One such letter was sent to Dean Blegen by Dr. Wilcox on May 23, 1958. He said:

“As you know Mr. Lunden has proposed to treat the Cedar Creek Forest project in the same way as the Hormel Foundation, so that overhead funds which are obtained in connection with research projects will be divided, the Business Office retaining 5% of the total grant and the remaining funds, if any, being assigned to the Cedar Creek Forest project.”

Dean Blegen replied saying that he approved this use of overhead money. Also in May several research projects were underway or proposed. They were: Bird nesting—Breckenridge, Ecosystem studies—Lawrence, Bray and Ovington, Grassland animals—Warner, Mouse ectoparasites—Cook and Beer, Animal activity instrumentation—Warner and the Institute of Technology; Gray and fox squirrels—Beer, and class use by Drs. Beer and Lawrence. Educational visits were made by students from six colleges and one high school.

On September 22, 1958 Dean Blegen appointed the Advisory Committee for 1958-1959. They were, Hodson, chairman, Breckenridge, J. J. Christensen, Kaufert, Lawrence, Marshall, Spratt, Wright and Dean Fenske. Dr. Lawrence could not serve in 1958-1959 because he was on leave to study glacial variation and vegetation history in southern Chile. To replace him Dr. Ovington, from England was named an Honorary member. The representatives from the Academy were Andrew Selm, Gustavus; Max Partch, St. Cloud, Merle Meyer, University; James Jones, Macalester; and Howard Orr, St. Olaf.

On October 8, there was another of many letters from Dean Blegen to President Morrill begging support funds for Cedar Creek. In closing he said something which expressed his sincere interest in the Area:

“I am deeply interested in the Cedar Creek project as a whole and have taken much responsibility in encouraging the advance of the project these past few years. I have done this because I have regarded Cedar Creek as an
almost priceless asset to science in this University. Against this back-
ground, I should like you to know how deeply I would appreciate Uni-
versity aid as we enter the next period of development for the Area."

In responding President Morrill said that he could only promise to try to find a so-
lution when we came to make the annual budget for 1959-60. He also raised the
question as to the transfer of physical operations and management to Dean
Fenske. He wondered whether this item was still in the hopper.

On October 24, 1958 the Advisory Committee received a report of the subcom-
mittee on Operational Policy which had been appointed in April. In June they had
proposed that the three subcommittees on Ecology, Wildlife and Protection be
abolished and new ones established. The new ones they recommended were the
following:

1. Technical Subcommittee—Advises regarding the scientific aspects in-
cluding botany, zoology, geology, meteorology and water resources,
and reviews applications for use of the area.
2. Management Subcommittee—Advises regarding physical operations
involving land and buildings, including plans for acquisition of new
land, rental of lands not needed for research or teaching, disposition of
old buildings and plans for new buildings, location and maintenance of
roads, trails, fences, gates, and firebreaks.
3. Promotion and Fund Raising Subcommittee—Prepares lists of potential
sources of funds, aids in preparing annual budget, and recommends
methods of acquiring funds.

They also presented a very complete set of "Visiting Group Relations" which in-
cluded application for permission to visit the area, reporting required, and a listing
of sites that are zoned for dispersed individual movements.

In April this year Dr. Lawrence wrote to me suggesting that because of the
much weakened condition of Mrs. Corniea's health the timing was critical to have
the Advisory committee write to her. In addition to describing activities that
would be of interest to her the letter written to her closed by saying:
“The committee wishes to take this opportunity to thank you on behalf of the Minnesota Academy of Science and the University for your great foresight and devoted effort in the establishment and preservation of this wonderful area for natural history study.”

There had been some concern about the possibility that mosquito control activities might be planned for the Cedar Creek Natural History Area. But I was able to assure Dr. Wilcox on April 9, 1959 that Albert Buzicky, Director of the Metropolitan Mosquito Control District is fully appreciative of the area as a natural history study spot, and that he had informed his district supervisor of his decision to not treat the area for mosquito control. During the early months of 1959 there was considerable correspondence regarding aerial photography and mapping to the Cedar Creek Area; Dr. Merle Meyer drafted the specification for this project. On May 4 Stanley Wenberg wrote to Dean Blegen, saying:

“Just prior to budget making for a number of years now I have raised with you the question of whether or not, for purposes of administration management, the Cedar Creek Forest enterprise might not well be brought under the Institute of Agriculture to be handled in the same manner as the experiment stations are handled.”

Dean Blegen had made this same suggestion to the President much earlier.

On May 7, 1959 Dr. Wilcox wrote a long letter to Mr. Wenberg and the main point was this:

“I am able to give unequivocal assurance that no permit or privilege has ever been issued by me for the hunting of game birds or other animals in the area, and I am thankful that special precautions have been taken to discourage such activities.”

This letter had been prompted by an inquiry by Minnesota state Senator Ralph Johnson about the policies governing the use of the Cedar Creek Natural History Area and reports that special hunting privileges had been granted there. Dr. Wilcox pointed out that the area had been posted with permanent signs in a manner in which the Minnesota Department of Conservation assured us would satisfy their requirements for prohibiting trespassing, including hunting.

In September Dean Blegen appointed the Advisory Committee for 1959-1960. They were A. C. Hodson, J. J. Christensen, D. P. Duncan, Dean Fenske, D. W. French, D. B. Lawrence, J. C. Underhill, H. E. Wright and Dr. Wilcox, ex-officio. The Academy people appointed were Merle Meyer, University; James Jones, Macalester; and Ben Fawver, Mankato. Following a suggestion made to Dean Blegen a short time earlier Dr. Wilcox no longer served as Secretary. This position was taken by D. W. French. In a memorandum dated October 6, 1959 from Dean Blegen to the Advisory Committee Dean Blegen had this to say:

“Professor Hodson came in for a conference and I discussed Cedar Creek problems with him. We reached the following agreements:

1. I promised to arrange for a conference with Dean Fenske to propose to him that he take over the management of the housekeeping activities of the Cedar Creek area.

2. We agreed on a confidential basis to be thinking about the choice of a new Director to replace Dr. Wilcox, and I agreed to draw Dr. Marshall into this consideration.”

A short time later the meeting was held with Dean Fenske and the transfer of responsibilities was consummated. Earlier in June Dean Blegen had asked Dr. Hod-
son to serve as Associate Director of the Cedar Creek Forest Natural History Area.

Early in 1960 President Meredith Wilson wrote the following to the new Dean of the Graduate School, Dr. Bryce Crawford:

"During the closing days of his administration, Dean Blegen raised with this office the question of whether or not it would be possible to provide an additional $1,087.00 for the general mechanic at Cedar Creek Natural History Area."

President Wilson did provide the funds requested. About this same time on May 16, 1960 Stanley Wenberg wrote to Dean Blegen as follows:

"With changing leadership in the Graduate School would this not be a good time to accomplish the physical transfer of Cedar Creek Forest to the Administration of the Institute of Agriculture."

Mr. Wenberg had suggested this move a number of times before.

On October 6, 1960 Dean Crawford wrote the following to Dr. Wilcox:

"Let me just take this opportunity to thank you for spending an afternoon with me the other week. I not only profited greatly from the chance to learn about Cedar Creek, but also thoroughly enjoying the beauty of the spot and the enthusiastic and fascinating comment which you gave me regarding its development. I hope that we can work together to complete the development and carry this facility into a stable period of constant yield of scholarship."

In November this year the brother of Dr. Julia Anna Norris, who had a life estate reservation for her cabin, decided to give a release from this reservation. Dr. Norris had bequeathed her property to the University with the life estate reservation.

In 1961 as in 1960 the records of activities at the Cedar Creek Natural History Area were meager when compared with earlier years but some events can be reported. On March 21, 1961 Dean Bryce Crawford appointed a 1961-62 Advisory Committee consisting of the same University members who had been appointed by Dean Blegen in 1960. The Academy representatives were Howard Dorr, St. Olaf; James Jones, Macalester; Ben Fawver, Mankato, and L. D. Frenzel, Macalester. In accepting Dean Crawford’s invitation to serve on the Advisory Committee Dr. Donald Lawrence had this to say:

"I feel that additional land purchases is of utmost importance and urgency, especially to acquire full control of the shores of Fish Lake, Lindeman Lake and Beckman Lake, and if possible the headwaters of Cedar Creek also, so that potential sources of contamination of the waters of the Natural History Area can be held at a low level."

He also said in this letter:

"On the brighter side I know that you will be interested to learn that the Minnesota Chapter of the Nature Conservancy has just contracted for the purchase of a fine 80-acre tract of virgin prairie and savanna, known as the Winger Tract which will serve to extend the usefulness of the Cedar Creek Natural History Area southward. In this way, active dunes and blowouts have been added which were not present in any other areas." This tract was later renamed "Helen Allison Savanna" in honor of Helen, the "Grass Lady."

Dr. Lawrence made a third application for Hill Foundation funds to support his study of some energy relations of ecosystems. However, H. A. Heckman, Executive Director of the Louis W. and Maud Hill Family Foundation responded to the
request by saying:

"After considerable consideration it was decided that this is a reasonable point at which to terminate support for your project without causing you undue inconvenience and loss of results from work done to date. This action in no way reflects dissatisfaction with your work. On the contrary we appreciate having had the opportunity to aid you to launch this basic research program." The Foundation Board felt that sufficient progress had been made to attract federal funding.

On May 18, 1961 it was approved that the Minnesota Conservation Education Council would hold its spring meeting at Cedar Creek. This meeting was held with 76 adults in attendance. Various features of the area were explained by University faculty; geography by Dr. Borchert, flora of the area by Dr. Lawrence and wildlife by Mr. Gunderson.

At an Advisory Committee meeting on September 29 there was an extensive review of parcels of land to be purchased, and the recommendation that the committee should explore the possibility of obtaining support for a resident climatologist from one of several granting agencies of the Federal Government. On October 25, 1961 Dr. Wilcox wrote to Alvar Peterson saying:

"A party of 8 to 10 ladies from the Minneapolis Audubon Society wish to visit the Cedar Creek Area next Tuesday, October 29, from about 10 AM to 2 PM—if it is possible for you do so I would like to have you take them around to see the principal habitats and to acquaint them with the purposes of the area and the regulations we observe."

This is just one sample of the range of duties this young farmer was expected to perform. By this time the Technical Subcommittee members were Donald Baker, Evilee Gorham, James Jones, James Underhill, Herbert Wright, with John Tester, chairman.
On May 7, 1962 Dean Crawford wrote to Drs. Wilcox and Marshall announcing the appointment of Dr. Marshall to succeed Dr. Wilcox as Director of the Cedar Creek Natural History Area. In closing Dr. Crawford had this to say:

"I will not attempt to express to you, Art, the gratitude and appreciation which is due you for your long and successful efforts on behalf of Cedar Creek...of which you may claim to be the father in a very real sense. I know that this project which you have served so devotedly will continue to claim your devotion; and I am very glad that you will continue to be active on the Cedar Creek Committee."

Dr. Wilcox received another letter in May, this one from Stanley Wenberg who said:

"I got a kind of nostalgic twinge when I read Bryce Crawford's letter to you about the change in directorship for Cedar Creek Forest. And yet only a moment of reflection yields the realization that this is a very good thing. The change takes the administrative burden of responsibility off you. This alone should recharge your batteries for more fascinating concern with experimentation and research that characterizes your life.

It was a grand experience to have shared with you in this project, and I hope in some way the name of Arthur Wilcox will be identified with Cedar Creek Forest and its worth. It would be a richly deserved tribute for a job well done."

The tribute mentioned by Mr. Wenberg was accomplished. Dr. Marshall (1963) had this to say:

"Professor Wilcox was a devoted servant of the Academy and the project before and during his tenure as Director from 1954 to 1962. His contributions of time, energy, and thought were tremendous during this period. Fortunately, they were recognized by the dedication of a plaque in the Cedar Creek Laboratory on October 21, 1962 which was witnessed by some 200 people. This plaque reads: 'In appreciation of long and dedicated service to the development of the Cedar Creek Natural History Area for the use and enjoyment of scholars, inscribed to Arthur N. Wilcox, Director, 1954-1962 by the Minnesota Academy of Science and the University.' These words express succinctly our realization of his contributions and accomplishments."

This event came as a complete surprise to Dr. Wilcox because Dr. Hodson had told him only that a group of friends of Cedar Creek had arranged for an informal dinner meeting at the Laboratory and hoped that he would be willing to meet with the group and give a brief summary of the Area's development. The timing of this important occasion was indeed fortunate as Dr. Marshall mentioned, because only four months later, Dr. Wilcox passed away at his office desk on February 26, 1963.

At an Advisory Committee meeting held on August 6, 1962 Dr. Lawrence, chairman of the Subcommittee on Operational Policy, made the following suggestions. He cited the need for vacated farm lands at Cedar Creek for establishing a continuously renewing successional series for class demonstration and research so that young to old development stages would always be available. Dr. Lawrence also pointed out the problem of political repercussions coming from the fact that the University was allowing families to reside on Cedar Creek property without paying any school taxes although the children attended local schools.

At an Advisory Committee meeting on October 25, 1962 Dr. Marshall was introduced as the new Director. A few days later he visited with several property

The Arthur N. Wilcox plaque honoring him for his dedicated service to the development of the Cedar Creek Natural History Area. 1981.

owners near the Cedar Creek Area to get acquainted with them and to advise them that we were not going to have appraisers out there in the near future. At this October meeting of the Committee a number of important matters were discussed such as the role of the new Subcommittee mentioned earlier, methods for presenting research proposals, the rental of lands and a report from Dr. Wilcox saying that the large scale maps would be completed soon, and that construction of the weather station was well on the way. Dr. Eville Gorham reported that during the summer of 1962 he and John Sanger had been examining a number of soils at Cedar Creek. He said that the results so far showed that the chlorophyl derivatives were generally comparable to those obtained earlier in England. He stated further, that Dr. John Moyle and John Dobie were interested in the possibility of using fossil pigments as an index to fish crop magnitudes.

The Advisory Committee for 1962-1963 had as University members, A. C. Hodson, Chairman, James App to replace the late Dean Fenske, who died March 28, 1963, Walter Breckenridge, Donald Duncan, David French, Donald Lawrence, Herbert Wright, James Underhill, and Dr. Marshall and Dean Crawford ex-officio members. The Academy members were Ben Fawver, James Jones and David Grether.

On November 16 Dean Crawford informed Dr. Marshall that a grant of $3,500.00 was available to him for improvement of facilities in the Cedar Creek Area in the form of certain towers and their installation in connection with the work being carried forward by Dr. Dwain Warner.

On November 29, 1962 Dean Crawford arranged a meeting with Vice President Wenberg, William Nunn, Director of University Relations, R. J. Tierney, Univer-
sity Attorney, Dean Fenske, Mason Boudrye, and Professors Marshall and Hod-
son. The first item of business concerned the relation between the Minnesota
Academy of Science and the University in the joint sponsorship of the Cedar Creek
Natural History Area. Pertinent items were read from the original agreement. At-
tention was called to the concept of experimentation in the area which had been
introduced by Dr. Lawrence a few years before. There also was a thorough review
of the lines of authority in the administration of the area. Vice President Wenberg
raised a number of questions concerning the arrangement for providing funds for
the local school district, road maintenance, and deer hunting at Cedar Creek.

The problem of land acquisition was discussed thoroughly, and several proce-
dural suggestions were made:

1. No condemnation be exercised until neighbors, legislators, school offi-
cials have been placated and properly informed.
2. That a map showing the areas that are desired for completion of the con-
solidation program at Cedar Creek be made public.
3. It was agreed that land purchase programs should be continued ac-
tively.
4. Agreed that personal contact should be made prior to sending apprais-
ers to individuals holding land in the area.

In January 1963, Dr. Lawrence, chairman of the Management Subcommittee
wrote to Dr. Hodson suggesting changes in visitor regulations. He said:

"This new material explains the purpose of the area, and states where it and
the laboratory are located.—The document is sure to have wide circulation,
and may possibly be the only source of information for many people who
shall become exposed in a casual way to the Cedar Creek facility. This
would include students in introductory ecology classes, local residents,
members of the Minnesota Academy, and even members of the State legis-
lature. These people have only the foggiest notion of what the objectives
of the area are, and the present posted signs labelled 'Cedar Creek Forest' help
to further confirm them. These people need to be informed regarding the
nature of this enterprise because it is so foreign to anything in their experi-
ence. They are curious and mystified regarding what goes on in the area.
The confusion may be further enhanced because of publication in the local
East Bethel Booster last fall of news item regarding the discovery of a nudist
colony in the town of East Bethel in which it was stated, 'Many professional
people, including members of the University staff were members'. Also
parts of the area just east of the laboratory formerly were used for wild beer
parties before the area was acquired by the Cedar Creek Project. Also local
inhabitants and even their legislators have openly accused the University of
operating here a private hunting lodge for its own staff."

Dr. Lawrence went on to say:

"The few words to the introductory section on Purpose of Area may well
help to dispel those false notions."

A revision of the Cedar Creek Natural History Area Visitor Regulations was
presented on April 15, 1963. It included a brief description of the lines of authority
in the administration of the area including the mention of the three subcommit-
tees, Technical, Management and Finance. It stated further that the local custo-
dian, Alvar Peterson, had been deputized as member of the University Police
Force and that he would be responsible for the protection of the area and its facili-
ties. The uses of the area and permit and entry procedures were much the same as
had been the practice.
In June Dr. Marshall wrote to several Anoka County officials to report the results of a meeting held with them on May 27, 1963. At the meeting Dr. Marshall and the University Attorney reported on such matters as road maintenance, razing unoccupied buildings, to reduce trouble makers and that there was no hunting for any special group. Dr. Marshall said further:

"If some hunting became necessary to control the deer herd this would be on some open drawing system from which University employees would be excluded."

Earlier, in response to some questions about pocket gophers and weeds at Cedar Creek Alvar Peterson reported that weeds would not be a problem but some pocket gopher control might be necessary. At this meeting the County representative suggested a $25.00 per acre payment by the University in lieu of taxes. The University Attorney pointed out that this would be prohibitive considering the extent of University property in the State. He also said that the Cedar Creek Natural History Area and Laboratory was a form of "industry" which provided payrolls and that much of that money was returned to the County through expenditures by the staff for groceries, gasoline and services. It was decided in favor of $300.00 collected as a Memorial to Dr. Wilcox for the development of a library at Cedar Creek. Sometime later Dr. Duncan agreed to arrange for the design of a book plate for the library which might read, "Cedar Creek Natural History Area Library."

On December 6, 1963 Dr. Marshall wrote to Dr. Hodson with the request that the Advisory Committee assist in planning operations at Cedar Creek on a broad as well as a specific basis. He raised questions about the broad objectives for the project as a whole stressing both preservation and research aspects. He also requested specific recommendations by area as to: Habitats to be preserved, maintained and created, and the means to accomplish these objectives.

Director Marshall prepared a Progress Report for the year 1963 parts of which will be presented below:

1. Education—At least 850 persons visited the area, over half of whom were members of classes from Augsburg, Carleton, Macalester, St. Catherine’s, St. John’s and St. Thomas colleges. About 158 individual visitors came from nearby Bethel to as far away as Antarctica.

2. Research—The twelve projects are mentioned in order of their establishment:
   a. The productivity of soybeans having special pimentation properties—Jon E. Sanger
   b. Some energy relations of terrestrial ecosystems—Directed by Dr. Lawrence, funded by the Hill Family Foundation
   c. The effects of direction of slope on plants—an eight-sided mound with instrumentation for measurements of plant establishment, growth and reproduction, soil, surface and ambient temperatures, precipitation, evaporation, and soil moisture—Joseph Ives
   d. Fossil pigments as indices of productivity—Evilie Gorham
   e. Study of motile responses of animals—Dwain Warner
   f. Studies of the bark moisture content of aspen (Populus tremuloides)—James Fordyce
   g. Studies of properties of the ionosphere—W. R. Weber
   h. Studies of ruffed grouse drumming activities—E. C. Meslow
   i. The flora of the Cedar Creek Natural History Area—John W. Moore. He added 70 species of flowering plants to the flora list
   j. Use of color photos for vegetative classification—Merle Meyer
k. Effects of radiation on waterfowl breeding behavior—John Tester
l. Reinvasion and social dominance of small animal populations—John Tester

During 1963 the major installations for the radio-telemetry project were completed. They were two large towers with rotating directional antennae, the necessary cable connection to the laboratory-garage building, and a complete installation of receiving equipment. Beginning in mid-summer small radio transmitters were placed on badgers, red fox, skunk, cottontail rabbit and raccoon. Location of these animals was recorded at 45 second intervals. This automated system, developed by William W. Cochran, was truly a pioneer endeavor.

The 1963-64 Advisory Committee members appointed by Dean Crawford were A. C. Hodson, chairman, James App, Walter Breckenridge, Donald Duncan, David French, Donald Lawrence, James Underhill, Herbert Wright and Director William Marshall from the University. The Academy members were James Jones, Macalester; David Grether, St. Cloud; and William Downing, Hamline. On January 3, 1964 the Committee sent to Dr. Frenzel a permit for use of Cedar Creek Natural History Area by a Macalester College class on Winter Field Ecology. In his 1964 Project Report Dr. Marshall said that the most interesting activity was this course lead by Dr. Frenzel. A group of 18 students stayed at the laboratory four nights a week from January 6 to January 30, and carried on field studies on microclimates, plant distribution, bird and mammal populations, and on the limnology of Fish Lake. There was considerable correspondence with regard to this winter activity between Dean Berg and President Wilson of the University, and Dean Garvin from Macalester College all of it calling attention to the value of the Cedar Creek Natural History Area for educational purposes.

On February 27, 1964 there was a note sent to the Advisory Committee calling attention to the fact that:

"Art Wilcox passed away at his desk on the morning of February 26. Mrs. Wilcox and Family have expressed a desire to have the Cedar Creek Natural History Area benefit by a Memorial Fund to be established in his memory."

Dr. Marshall wrote to John Kirkvold, Area Forester on April 7 saying:

"I am writing to inform you of a proposed prescribed burning program on the Cedar Creek Natural History Area this spring. We wish to undertake this program to re-establish and maintain the savannah type of vegetation cover on a portion of the area. This type is disappearing fast."

He also mentioned that Dr. Frank Irving would be in charge, and that a similar project had been carried out at Carlos Avery and the Winger [Helen Allison Savanna] Nature Conservancy tract in 1962.

On May 7, 1964 James App wrote to Frank Pieper, Director of Civil Service Personnel, requesting a change of status for Alvar Peterson from General Mechanic to Resident Manager. In this letter he had some nice things to say about Alvar, and spelled out his duties.

"Since January 1957 Mr. Alvar Peterson, General Mechanic for the Cedar Creek Natural History Area, has performed in an exemplary manner. His present position is both unique and significant in its contribution to teaching and research in natural history. More specifically we find that Mr. Peterson's tasks, duties and responsibilities involve: Maintenance of buildings, equipment, roads, and fences for the 4600 acre natural history area. Per-
forms daily measurement tasks for a National Science Foundation sponsored weather station, installs equipment for research projects, maintains record systems, and directional signs. In addition he patrols the area against trespass yet providing for information and guiding through the area of various study and student groups, acts as the University agent in the rental of lands in the area, cooperates with the County Agent, Weed Inspectors and Fire Control officials in the control of noxious weeds, nuisance animals and fire."

As can be seen, Alvar was a very busy young man.

Progress Report of 1964

This shows a very busy year in many respects.

Education—About 800 persons visited the area, the largest group from Augsburg, St. Catherines, Carleton, St. John’s, St. Thomas, and St. Cloud Colleges. There were 175 visits to the area by individuals to review and observe research being carried on. They came from 19 United States and Canadian Universities and five foreign countries. There were other visits by representatives of the Atomic Energy Commission, Ford Foundation, U.S. Bureau of Sport Fisheries and Wildlife and the U.S. National Museum. A spring course, usually taught at Itasca by Dr. Tester was held at Cedar Creek this year.

Research Activities—In addition to those reported for 1963, 38 permits were issued. Some of them are mentioned below:

1. Plant invasion of an abandoned field—D. R. Disrud
2. Deer use on Cedar Creek Natural History Area—James Beer
3. Radio-telemetry—Warner, a total of 40 red and 3 grey foxes were radio- tagged and the movements of 6 deer, 11 showshoe hares, and 8 cottontail rabbits were studied.
4. Solar radiation measurements—Dr. R. C. Burkebok, A solar integrator was developed by the Bioelectronic Laboratory of the Museum of Natural History.
5. During the year, fields in Alvar Peterson’s farm were used by members of the Physics Department for photographing an eclipse of the moon and for tracking high altitude balloons.
6. Ethology, social organization and natural history of the 13-lined ground squirrel—Harvey Gunderson
8. Effects of radiation on waterfowl breeding behavior—John Tester.

One very important event took place in 1964. The duck flight pens were constructed for the waterfowl behavior studies to be carried on by Dr. Frank McKinney and his students.

According to Dr. Marshall, the flight pens were and probably are still the best in North America. They were designed with concealed observation towers, sturdy understructure and good water control. They were large yet covered with netting high enough so the birds had plenty of room. As a matter of policy they were placed in old fields on the west boundary where they did not interfere with the natural values of the bog.

Dr. Marshall wrote to Dr. Hodson on June 4, 1965 to recommend that the Statutory Game Refuge at Cedar Creek be abandoned for three reasons. (1) With our policing on trespass, any hunting in the area would be under our control. (2) Main-
taining this particular area as a refuge might be a hindrance to necessary control of deer or other wildlife populations in the future. (3) The presence of the refuge gives a State administration agency some responsibility for management of the area and in fact ties their hands in this relationship.

A few months later on August 2 Dr. Hodson wrote to Dean Bryce Crawford with this request:

"I am writing to request that you consider a replacement for me as chairman of the Cedar Creek Advisory Committee. I have been unable to give the assignment the amount of time and effort which the position requires, and will be even less able to do so during the next few years. We are faced with the pleasant but time consuming project of planning and overseeing the construction of a new building. In addition I shall have to devote considerable time to the selection of new and replacement staff."

**Project Report for 1965**

A major change in budgetary arrangements for supervision was made. The position as Director of Field Biology Program for the Itasca Biology Session and the Cedar Creek Natural History Area was established on July 1, with Dr. Marshall appointed to this new position. Concurrently, a budget for these programs was set up and in December the budget was transferred to the newly established College of Biological Sciences. The direct budgetary responsibility for facilities remained in the Institute of Agriculture.

The recommendation for these changes was spelled out in an important memorandum from Deans Berg, Crawford and Thompson addressed to Vice President William Shepherd in February of 1965. In this document entitled, "Proposal for Support of Field Biology Program," they reviewed the remarkable success of the Programs at the Lake Itasca Forestry and Biological Station and at the Cedar Creek Natural History Area. They pointed out the need to solve some problems of lead-
ership and administration and among other things had this to say:

"After joint examination of the situation, Dr. A. C. Hodson, Head of the Department of Entomology, Fisheries and Wildlife, Dr. Marshall and the three of us agree that the two programs—field biology and wildlife management—are of such magnitude and have the potential for further development that one person cannot do justice for both."

Dr. Marshall had been handling the Itasca and Cedar Creek programs on a part-time basis with his primary responsibility teaching and research in the academic department.

They proposed the following as a resolution of leadership in Field Biology:

"Our recommendation is that a Director of Field Biology be established who would devote full-time to the leadership and administration of appropriate programs at Cedar Creek and Itasca. Dr. Marshall, in choosing between the alternatives of the directorship and the teaching-research position in the Department of Entomology, Fisheries and Wildlife has opted for the former. In this decision, we heartily concur. It also has the approval of Dr. Hodson, if satisfactory arrangements can be made to meet the staff needs in his department created by the change of primary responsibilities and duties of Dr. Marshall."

They went on to explore ways in which financial requirements, such as salaries and operating costs, might be accommodated.

**Education**—There were in 1965 at least 715 visitors including 226 from Augsburg, Carleton, Hamline, Macalester, Mankato and St. Thomas colleges, five University departments, and 128 students from Anoka, Bethel, Fridley, Sibley and Soderville High Schools. The most spectacular group toured the area in September after attending meetings of the International Quaternary Association (INQUA) in Denver. They came from U.S.S.R., United Kingdom, Japan, Ireland, Germany and Canada as well as the U.S.A. They were particularly interested in Cedar Bog Lake, the site of Lindeman's pioneer work in trophic ecology. They were served dinner by the Lone Elm Mother's Club of Bethel who often provided such service at Cedar Creek affairs. One hundred seventy-two individuals visited to observe research in progress. They came from six U.S. Universities, University of Western Australia, University of British Columbia, and the University of New Zealand. In addition there were people from the U.S. Fish and Wildlife Service, the Wildlife Management Institute, Brookhaven National Laboratory, Oak Ridge National Laboratory and the Atomic Energy Commission.

**Research**—Altogether there were 61 permits issued to individual workers. Among the new ones were a study of energy flow through detritus pathways by Dr. William Reiners assisted by his wife Norma, Elsie Williams, and Rick Anderson, Dr. Frank McKinney's work at the experimental flight pens continued to increase in scope and intensity. Emphasis was placed on territorial behavior and the effects of radiation on the Shoveler and Green-winged teal and the courtship of the European teal. Surface-air temperature relationships of two white-tailed deer fawns were investigated by Arron Moen, and Dr. Richard Mackie conducted deer trapping and marking trails during February and March. Two other notes from 1965—There was a gift of 230 used railroad ties from the Great Northern Railroad to build a walkway to Beckman Lake Area. Another group, the lone Mother's Club of East Bethel, served hot lunches and occasionally dinners.
The new Advisory Committee appointed by Acting Dean Frank Boddy to serve until September 1966 had as University members, Alan Brook, Chairman, James App, David French, Donald Lawrence, Merle Meyer, John Tester, James Underhill, Herbert Wright, and William Marshall, ex-officio. The Academy members were David Grether, St. Cloud; William Downing, Hamline; and Dale Chelberg, Mankato.

An important meeting of the Advisory Committee was held on March 3, 1966. Dr. Alan Brook opened the meeting and then turned the floor over to Dr. Marshall. Dr. Marshall stated that, although the Committee had not been fully active in recent years, beginning this year, at least a fall and spring meeting should be scheduled. He said further that he would have more time for the program now that the office of Director of Field Biology was developing. He drew attention to a large scale map of Cedar Creek prepared by Alan Sargent of the Radio Telemetry project showing roads, fence lines and cover. He also informed the Committee that a position of Biometeorologist had been established at the level of Assistant Professor and that two land acquisitions had been completed in 1965—the north half of Beckman Lake and the Almqquist property. He also mentioned that Dr. Frank Irving was continuing his controlled burning experiments.

The Committee was asked for advice on the following problems.

1. Early in December, Dr. Tester presented a supplemental application for the support of the research project entitled “Motile responses of animals to environmental factors.” This involved the radiation of one member of pairs of raccoons and hares to study movements and activities. A number of reservations were considered. The first concern was that there might be a danger or influence of radiation on the gene pool and the suggestion was made that the progeny of such pairs should be destroyed rather than released. The second concern was related to the effect of the removal of a number of animals from small populations. The Committee was assured that initially only three irradiated individuals from each population would be used and the Committee required that these and their progeny, if any, would be destroyed or sterilized.

2. Dr. W. B. Cheston of the Physics Department submitted a proposal for the establishment of an astronomical observational laboratory for experimentation on the infrared and long wave part of the visible spectrum. This proposition was approved with the provision that the dome would be removed upon completion of the project. However, no dome was ever constructed.

Previously there had been three subcommittees, management, technical, and promotion and funding. Dr. Marshall suggested that a new Management Subcommittee should be appointed to review management problems on a continuous basis. Dr. Lawrence commented that there should be a Technical Subcommittee and that three members for these committees would be adequate. Those appointed were Management—Donald Lawrence, chairman, James App and William Downing and Technical—James Underhill, chairman, Dale Chelberg and Herbert Wright.

The newly formed Management Subcommittee wasted little time because on May 6, 1966 they had a report to present to the Advisory Committee. In it were too many details to attempt to cover but they included approval of the construction of additional duck ponds, blocking the ditch draining Fish Lake, the question as to what to do about exotic plants on farms that had been purchased, and trail construction with old railroad ties and the uses of old tire inner tubes to support plat-
forms in the bog area. On another item of business it was reported that Dr. Ney had decided to locate his astronomical observatory elsewhere, and that Vice President Wenberg would present another application for support to the Fleischman Foundation. In 1966 there was page after page of negotiations by Dr. Marshall with land owners to arrange for appraisal and purchase of tracts of land. On December 16 Stanley Wenberg wrote again to Col. Clarence Schutte stating that he was sending him a copy of the application that was being prepared for submission to the Foundation to complete land purchase.

In 1967 the Director was very much involved in land purchase as he had been in 1966. In March Dr. Ownbey called attention again to Dr. Lawrence’s concern over the need to acquire all of the East Shore of Fish Lake as an addition to the Cedar Creek Natural History Area. He said that great harm could be done to the natural biota of the lake if it is used as a recreational area. And further, that not only could we foresee poisoning of the water to control aquatic vegetation, but regular spraying for mosquito larvae would undoubtedly have far reaching effects. In 1967 there was considerable correspondence dealing with such matters as facility addition, the razing of old buildings, new wells for the duck project, fencing and merit increases for Alvar Peterson.

On June 2, 1967 Julius Berger, Secretary of the Fleischmann Foundation wrote to Vice President Wenberg as follows:

“This will advise you that the Trustees of the Foundation after there study of your presentation of April 24, 1967 have, in the exercise of their discretion, voted against any grant on the same. This is not based on any lack of appreciation of the merits of your application and we regret our inability to respond favorably."

Vice President Wenberg responded by saying:

“Thank you for your letter of June 2, 1967 and for the trustee’s consideration of our April 24, 1967 presentation on behalf of the Cedar Creek Natural History project. We are naturally disappointed with your decision, but will continue to explore all areas of funding for the project.

We are pleased, of course, that this proposal is aimed at finishing rather than initiating the land purchases made possible so adequately with the original grant of the Max C. Fleischmann Foundation in 1954. Had it not been for our difficulties with the County Commissioners of the two counties involved we would have long since finished our land acquisitions. From what was known of Mr. Fleischmann’s interest I have a feeling that he would be very proud of what has been and is being accomplished at Cedar Creek Forest.”

**Project Report for 1967**

One of the major developments this year was the purchase of the east shore of Fish Lake. Work by Dr. John Borchert and Vice President Wenberg resulted in an appropriation of $102,000.00 by the State Legislature for completing the purchase of this land. The Director of the Minnesota Outdoor Resources and Recreation Commission made an important need presentation to the Legislature.

*Education*—At least 600 students made 800 visits in the Area. Dr. James Jones held a Macalester College winter ecology course over a three-week period with 18 students. A newly established C.B.S. Field Biology course had students visiting the Area on six Saturday mornings during the spring quarter, and Dr. Frank Irving carried out a spring burning with 23 forestry students as part of a special seminar.
View of Fish Lake, 1955.
And again the same Colleges that had visited the Area in previous years were back again, as were students from four high schools.

**Special Groups**—Dr. E. I. Sucoff served as guide for 24 members of the Institute for U.S. Forest Service Employees, and 13 members of the Association of Midwest Biology Teachers visited the Area. On September 26, 92 members of the Minnesota Academy of Science met all day at the Laboratory. Summer Institute High School Teachers from Macalester and St. Thomas also visited the area as did 34 members of Whistling Workers 4-H Club from Cedar, and Dr. Cushing had his plant ecology students there several times during the fall quarter.

**Research**—In addition to investigations that were reported before, some new projects will be mentioned. However, of these continuing the Telemetry project under the direction of Dr. Warner and Tester was the most active. An addition to the garage-laboratory building provided adequate quarters for the 15-20 workers who assisted in the field work. A tremendous amount of data was obtained from transmitters on owls, hawks, raccoons, deer and red foxes. The study on the relation of fire to oak-savanna maintenance was continued by Dr. Irving with 200 acres burned in April and May. An analysis of wetland plant communities was carried on by Roberta Lammers. The ecological niche of leptospires of the “Biofexa Complex” and their role were investigated by R. A. Harvey and R. C. Johnson of the Department of Microbiology. Fish Lake was sampled throughout the summer and winter months to determine the distribution patterns of the spirochetes. Dr. Arron Moen who had held the position of Biometeorologist was replaced by Dr. Robert Maxwell.

**Management and Program Development 1968-1977**

In February 1968 the *Minnesotan* had an article devoted to the College of Biological Sciences including work at Cedar Creek Natural History Area. This portion dealt with a Cedar Creek Spy System that Tracks Animals. This is part of what they had to say:

“In 1957, Sputnick dogs flashing radio messages back to earth gave Associate Professor Dwain W. Warner in the Museum of Natural History an idea. He called Dean Spilhaus of the Institute of Technology to help him devise instruments that could measure the behavior of animals in their natural environment.

With Professor Otto Schmitt of the Department of Zoology and Professor Homer Mantis of the Department of Physics, they developed plans to adapt space-age electronics equipment to studies of animals in the wild.

However, getting the equipment was not a one-shot operation. Constant advances in instrumentation necessitated the services of specialists like Engineer Larry B. Kuuehle of the Museum’s Bioelectronics Laboratory."

Not mentioned in the article quoted above were two individuals who were the first to work on this project. One was a student of Dr. Otto Schmitt, Stewart Jacobson, who had studied the mechanism of the Venus Flytrap. Of more importance was the extensive equipment development provided by William Cochran.
The Advisory Committee held an important meeting under the chairmanship of Dr. Donald Lawrence on March 29, 1968. Dr. Marshall referred to the funds received from the legislature for Fish Lake's east shore land purchase and stated that steps were taken to obtain matching monies from the Land and Water Conservation appropriation (LAWCON) which was administered by the Bureau of Outdoor Recreation of the U.S. Department of Interior. He added that of this date $28,140.00 had been received and that purchase of all tracts except three acres had been consumated, and that an additional application for $35,070.00 matching funds to complete purchase of interior tracts had been processed. Stanley Wenberg and Dr. John Borchert were very much involved in obtaining both the State and Federal funds.

Chairman Lawrence interrupted the meeting to point out:

"—that there were three reasons why today's meeting was of very special significance. The first was that it was the very first time that there was a representative of the Dean of the Graduate School, in this instance Dean Boddy; secondly, that the President and Executive Secretary of the Minnesota Academy of Science were present; thirdly, that it was the 10th anniversary of the meeting when the structure of the various subcommittees was established."

The possible participation in the International Biological Program was discussed and it was agreed that research should come from individuals and that Cedar Creek research should not be directed toward any IBP program.

Progress Report 1968—Education

There were 48 visits with a total of 665 students. The Macalester Winter Ecology course under the direction of James Jones was held from January 9 to 25 with 104 student nights in the laboratory dormitory. Other classes from St. John's, Macalester, St. Thomas, Moorhead, Ramsey Junior College, Augsburg, St. Cloud, Carleton, Mankato and Willmar Community College visited the Area. Among the special groups were 18 members of a special training course for silviculturists with Dr. Lawrence in charge. A number of other groups visited the Area including the University Wildlife Manager's Club, Girl Scouts of Minneapolis, Boy Scouts from Coon Rapids, 4-H Club from Stacy, Boy Scouts from St. Paul, Cub Scouts and parents from St. Francis, The Anoka Nature Club, the Minnesota Bird Club, and several High School groups. There were 268 signatures of people from seven states and from foreign countries who spent a total of 301 days at Cedar Creek.

Research—In 1968, 57 permits for research projects were issued. The waterfowl behavior studies under the direction of Dr. Frank McKinney were continued including radiated and non-radiated blue-winged teal and the interactions between breeding pairs of mallards. The radio-telemetry project continued with extensive use of the laboratory and garage-workshop areas. This project has attracted worldwide attention. Dr. Marshall requested a log of work hours in 1968 and there were 2,500 man days devoted to the major project. Animal's activities monitored by radio included, red fox, raccoons, striped skunk, snowshoe hares, ruffed grouse, and three species of owls—barred, great horned, and saw-whet. Controlled burning continued and the effect of fire on herbaceous vegetation was investigated by Richard Anderson. Mrs. Margaret Weaver and Dr. French made collections of higher fungi, and Ronald Hellenthal made extensive collections of chironomid midges. Stanley Hedeen collected tadpoles of the mink frog, and green frog for
growth curve studies. A number of other studies continued from previous years, and the Minnesota Bird Club conducted its annual Christmas Bird Census at the Cedar Creek Natural History Area.

Dr. Marshall reported on a number of items in a memorandum to the Advisory Committee dated September 19, 1968. A review of the returns on tagged deer showed that 31 had been tagged between 1964 and 1968. Thirteen of them had been reported killed from 1 to 65 miles away. A high percentage of the kills occurred during the first fall. On management discussed at a previous meeting he had this to say:

"I presented tentatively an idea to maintain the present Alvar Peterson property (assuming it will be purchased) as an open prairie by the use of grazing and/or fire. The area around Fish Lake would be maintained as oak
savanna by the same means. Farming, to maintain bare ground, would be continued in the northern part of the area."

At a meeting of the Advisory Committee on December 12 it was announced that the State Legislature had provided $42,000.00 to upgrade the telemetry system and for a deep well for the experimental duck pens. Lawrence scholarships were awarded for 3 students to do botanical research and 8 students were awarded "Cedar Creek Research Stipends" since last spring.

At this meeting there was considerable discussion with regard to the possible designation of the Cedar Creek Natural History Area as a State Scientific and Natural Area. Were this to be done the Department of Natural Resources would have protective control of Cedar Creek, but the operations and management by the University would continue as at present. Although this designation would involve land transfer (lease) to the Department of Natural Resources for a number of years, the University would retain possession of the land. It was suggested by Mr. Jerry Jensen of DNR that this designation would protect the area from power line disputes, snowmobilers, trespassers, poachers and the like. Dr. Lawrence asked Mr. Jensen if Fish Lake would have protective benefits from the designation since the lake is being exploited by hunters and fishermen. He responded by saying that the DNR could protect Fish Lake in the future provided that the Cedar Creek Natural History Area was designated as a Scientific and Natural Area. He also said that the DNR would like to sign a lease with the University. A motion was made and passed recommending the Cedar Creek Natural History Area be designated as a Scientific and Natural Area. This designation was never consumated because of reconsideration by the CCNHA Advisory Committee who felt that DNR would restrict experimentation, and because of reluctance by the DNR Commissioner's Advisory Committee on Scientific and Natural Areas to sanction experimentation on SNA's. Dr. Parmelee reminded the group that Cedar Creek might sometime be designated by the National Park Service as a "Registered Natural Landmark," not a "National Landmark."

Progress Report 1969

This year major steps were taken to acquire land and the weather station was updated. The acquisition of the Alvar Peterson property in the central area was completed. Alvar would continue to use the house as his home and the barn would be used for the storage of major equipment. There was an important announcement from Dr. Marshall in which he said:

"As most persons connected with the Cedar Creek Natural History Area know I have asked to be relieved as Director of the Field Biology Program, this because of a basic desire to return to teaching and research programs in Wildlife Management. Cedar Creek is truly a worthwhile project and deserves the continued support of both the University and the Minnesota Academy of Science. I hope to continue to be associated with it as a research worker and educator."

Education—The winter ecology class of 17 students under the direction of Dr. James Jones carried on field studies January 9-27. Classes from 9 colleges and 8 University departments involving 763 people visited the area as did students from 3 high schools. On December 9, 90 individuals from the Midwest Wildlife Society, which was meeting in St. Paul, also were among the visitors, and on May 10 there was a "Field Day" in which five different classes participated and personnel of the radio-telemetry project and the Waterfowl Behavior Program acted as guides.
There were about 500 visitors from 16 states and 9 foreign countries.

**Research**—In Dr. Donald Siniff's report on the radio-telemetry project he said that the staff was continuing to design and carry out tests with new equipment. More animals of the various species tagged in previous years were studied to obtain data on longevity, seasonal movements, habitat use, and in the case of skunks studies of temperature in winter occupied dens were carried out in some detail. Two cases of dead skunks with rabies were found. In addition, muskrats, carp and northern pike were fitted with transmitters.

In Dr. McKinney's waterfowl behavior studies, effects of radiation on behavior were carried on by Ronald Barrett and the breeding behavior of mallards by Julie Barrett; while Rebecca Field made films of mallard courtship and Richard Abraham continued to make tapes of mallard vocalizations.

Margaret Weaver collected fungi at seven sites. She and Dr. French identified most of them and others were sent to specialists at Michigan, Tennessee and Massachusetts. They listed 112 species of which 74 were identified. Drs. Gorham and Pratt completed their studies of photosynthetic nonsulfur bacteria, and Dr. Mackie continued for the third year with his deer trapping project.

The controlled burning of 190 acres was carried out in April with forestry class participation. A class from the School of Public Health observed smoke conditions from the standpoint of air pollution on two mornings. Richard Anderson designed and carried out a pilot phenological study along a designated walkway through the Cedar Bog area. He also completed a series of maps which show all known grazing, cropland or cutting.

**Project Report 1970**

Dr. Marshall was able to acquire an additional 100 acres which made the total land holdings about 5400 acres.

**Education**—The James Jones' winter ecology class used the area with students housed and fed at the laboratory as they had been for several years. Dr. Irving directed the controlled burning of 145 acres with student help, and a special class field day was held in May with activities of the radio-telemetry and waterfowl behavior projects explained to them. During 1970 there were 27 college classes from eleven colleges with a total of 447 students at Cedar Creek. Seven University departments also scheduled field trips in the Area. In addition, one-day visits were undertaken by 17 non-college groups numbering 362 people, including 4-H groups, public schools, conservation and forestry agencies, and various clubs.

There were 86 visitors from 28 states and the District of Columbia, and from foreign countries, Israel, Spain, New Zealand, Australia and Canada.

In July, 1970, a training program in “Vertebrate Behavior and Ecology” was funded by N.I.H. Dr. John Tester was the Program Director and Drs. McKinney and Siniff participated. This program was established to train pre-doctoral and post-doctoral students in the use of telemetry, radionuclide tagging, and biophysical aspects of ecology and behavior. Because the training grant emphasized techniques it overlapped in many ways research that was being conducted under contract with the U.S. Atomic Energy Commission with Drs. Tester and Siniff being the principal investigators.

**Research**—There were 49 research permits issued in 1970, many of them continuing projects.

Among the new ones were a study of the occurrence of Athiorhodaceae (nitro-
gen-fixing purple bacteria) in woodland and pond soils—Gorham and Pratt; the fishes of Cedar Creek from the Cedar Creek Natural History Area—20 species collected—Wayne Hadley; irradiated animals at Cedar Creek—six skunks are the only irradiated animals, no irradiated animals have been lost—Richard Huempfner; trapping of deer at Cedar Creek, 19 trapped and two followed through the summer, since 1967, 36 deer have been successfully tagged and released, in addition 5 hunter kills, 2 sightings, one found dead, one road kill and 9 locators at 1 1/2 to 45 miles from release point—Dennis Passa.

Drs. Tester and Siniff reported that the fabrication of radio transmitters and receivers, and modifications of the automatic telemetry system were carried out during the year. Work was initiated on a new channelized receiver which will make it easier to locate and identify individual animals. The following animals were monitored during the 1970 season. They were 25 snowshoe hares, 22 raccoons, 18 striped skunks, 41 ruffed grouse, 7 muskrats, 5 red squirrels, 6 gray squirrels, 9 carp, and 5 northern pike. They went on to say that during the past five years 10 raccoons and six striped skunks have been given sub-lethal doses of gamma radiation and their movements and behavior monitored. All were removed prior to the breeding season! Home range and activity comparisons, pre- and post-radiation, do not show any significant patterns.

It is important to note that Dr. Marshall's request to be relieved of the position as Director of the Field Biology Program was honored. He was replaced in 1970 by Dr. David F. Parmelee to direct the activities at both the Lake Itasca Forestry and Biological Station and the Cedar Creek Natural History Area. He specializes in Arctic and Antarctic birds. He received his B.A. degree at Lawrence University, the M.S. at the University of Michigan and the Ph.D. at the University of Oklahoma.

At an Advisory Committee meeting on February 11, 1971 Dr. Parmelee mentioned that he was attempting to reanimate the Committee and Dr. Lawrence asked to be relieved of the chairmanship but agreed to continue to serve on the Committee. A little later, in March, Dean Crawford appointed a new Committee consisting of Daniel Frenzel, chairman, James App, Donald Gilbertson, David Grigg, H. B. Tordoff, John Tester, Donald Lawrence, and Frank Irving. The representatives of the Academy were Alfred Grewe, St. Cloud; Paul Jensen, Carleton and Lyle Bradley, Anoka Senior High School. Dr. Frenzel was President-elect of the Academy at this time.

During a committee meeting on April 28 it was agreed that the committee should meet once each quarter and that there should be one committee with three appropriate members selected to review research proposals. Among proposals approved were the Ecological studies of small mammal populations—Elmer Birney; Analysis of wetland plant and insect communities in the Cedar Creek Natural History Area—Roberta Lammers; Actual and potential seedling development on abandoned fields undergoing secondary succession—Lanny Boyd; and the summer distribution, movements, habitat use and food of white-tailed deer wintering in the Area—James Peek.

At a meeting on August 4, 1971 Dr. Lawrence proposed the following: Steps are needed to remove exotic plants, there is a need to initiate further experimental use of abandoned cultivated fields for the study of succession, and there is a need for a survey of bryophytes and lichens in the near future to establish a base for the estimation of future changes in air quality.
Progress Report 1971

Education—A new course Field Botany to be conducted in spring by Lawrence beginning in 1972 was approved. There were 298 students from 9 Minnesota colleges and 6 University departments who visited the Area, and 27 people from 4 out-of-state universities. A number of field classes carried out instruction programs including the winter ecology course offered by Macalester College, controlled burning under Dr. Frank Irving, and one-day visits by 316 students from Minnesota secondary schools.

Among the special groups who visited Cedar Creek were the Wildlife Manager's Club, the St. Paul Eco-Action Club, Unitarian Society, Cambridge State Hospital, boy Scout troops, Minnesota Bird Club and the St. Paul Science Museum with a total of 204 people participating. Visitors from Australia, the Netherlands, New Zealand, Lebanon, Sweden and Canada also were shown the research activities underway.

Research—Among the new projects undertaken in 1971 were A comparison of the nutrient status of tamarack on two different sites—Principle Investigator Donald Tilton; Winter ecology of the mudminnow—James Jones; An investigation of natural very low level frequency electromagnetic radiation at Cedar Creek—Lane and Cartwright, Physics Department; Seeds of 20 species of plants in old fields from 1 to 30 years since cropping were found by Lanny Boyd working under the direction of Dr. Lawrence; Phenological and nutrient studies of trembling aspen; a food source of ruffed grouse—John McColl; Utilization of sumac by white-tailed deer and an evaluation of the winter use of burn treatments by the deer—James Peek; and Variations in composition and amount of marsh gas flows—F.M. Swain.

On the radio-telemetry project there were several developments. Among them was the design of a thermostatic switch to measure temperature in grouse snow burrows, a temperature transmitter to measure deep body and skin surface temperature on species of owls, and improvement of transmitter performance to overcome antenna failure. Studies continued on skunks, snowshoe hares, squirrels, muskrats, and ruffed grouse.

An Advisory Committee meeting was held on March 16, 1972. Dr. Irving stated that 319 acres would be burned during April and May by his forestry class, and approval was given for a new soil survey to be conducted by the Soil Conservation Service. Mr. Kuechle reported that the proposed airport to be built near Cedar Creek would be a threat to telemetry equipment but there would be an even greater threat to wildlife because of increased population pressure in the area. Dr. Frenzel said that on April 1 from 75-100 students attending the 2nd Annual Central Wildlife Students Conclave would visit Cedar Creek, and that persons attending the AIBS meeting in Minneapolis would be chartering buses for Cedar Creek tours in August. At a meeting on May 8, 1972 it was decided that the membership of the Advisory Committee would be the same until 1973, and James Peek's request to have a student study white-tailed deer use of burn treatments to follow up the winter use study was approved.

Progress Report 1972

Education—There were visits by 720 people from 8 Minnesota colleges, 5 University departments and from the University of Wisconsin and North Dakota State University. Students from 7 secondary schools numbering 271 also visited the
Area. Among the 13 Special Groups there were 426 visitors, and there also were foreign visitors from Japan, England and Canada.

Research—Many of the investigations mentioned in previous years were continued through 1972. Others that either were missed in presenting Progress Reports before or were new are the following: Ecology of female ruffed grouse during the breeding season—Stephen Maxson; Energetics and heat budget of winter-dormant black bears in Northeastern Minnesota in cooperation with the North Central Forest Experiment Station with a simulated system established at the Forest Service Kawishiwi field station—Maxwell; and a major project on waterfowl behavior which involved the study of pair formation and spacing of breeding pairs of American Wigeon—McKinney and staff.

The telemetry project under the direction of Drs. Tester and Siniff was continued with most of the studies reported before continuing. Since the telemetry program was started there have been 35 papers published and 14 theses.

The Advisory Committee had a dinner meeting with County officials on March 17, 1973 which included County Commissioners and Engineers. Dinner was served to the group by the Lone Elm Mother’s Club. The Committee also approved some new research proposals. They were Breeding behavior of tree frogs—Virginia Moyie; Mosquito larvae in pitcher plants—Judi Olson; Radio marking and tracking of badgers—Richard Lampe; and Dragonflies of the Area—John Harstad. The weed problem was raised again by Dr. Lawrence but it was agreed that no satisfactory solution to the problem had been found to date.

Progress Report 1973

Education—There were 479 visits by students from the University and several Minnesota colleges. An additional 59 came from colleges located elsewhere, and 266 high school students also visited the area. Among the Special Groups were a YMCA group, 4-H Club, Minnesota Hiking Club, Izaak Walton League, Cub Scouts and the Minnesota Bird Club. Dr. Lawrence’s Field Botany class of 25 weekly spring visits; each student studied the ecological life history of single species including 7 trees, 4 shrubs and 13 herbs.

Research—Here emphasis will be placed on new projects and the results of some continuing or completed projects. Fire and oak savanna, 207 acres burned—Irving; Soil survey of Cedar Creek Natural History Area, completed—Grigal; Predatory strategies of badgers—Binney; Establishment of two breeding populations of mudminnows, one in Fish Lake and one in South Marsh—Jones; and continued studies of social behavior of waterfowl and rails—McKinney. In the telemetry program Mark Fuller tested both tail-mounted and back-pack harness methods on several species of hawks and owls with success. In the winter ecology study of ruffed grouse Richard Huempfner radio-tagged 54 grouse during 1971, ’72 and ’73. Most of the mortality came from owl and goshawk predation. Several tests were run to determine whether transmitters might have the affect of reducing grouse weight. Pierson investigated the significance of the olfactory system in the ecology and behavior of gray squirrels. Olfactory bulbs of 3 males and 3 females were removed bilaterally with complete success. Larry Kuechle reported that a new tracking receiver had been developed as was a transmitter to telemeter heart rate for a project evaluating the effects of snowmobiles on deer. Work was continued on improving the range and reliability of the transmitters used on all animals.
Dr. Maxwell along with Wade Little worked on the application of weather station field equipment for measuring the diurnal heat budget of a chipmunk both in its den and above ground.

In March of 1974 new Guidelines and Regulations were reviewed and approved by the Advisory Committee. In general they were not much different from those reported on previously. They did include more specific requirements regarding use of facilities including phones, parking, use of roads and trails, picnicking, dormitory and kitchen use; and restrictions on smoking, use of alcohol and the possession of fire arms and archery equipment. On the back of the Cedar Creek Permit Form is the following statement:

“Cedar Creek Area is an outdoor laboratory for scientific and educational purposes. It is the responsibility of each investigator to remove all research materials (traps, markers, etc.) when his project has been completed. Every attempt should be made to return the area to the condition in which it was found. Plastic marking tape with the assigned number of the project will be provided by the Resident Manager in order to facilitate easy identification and removal of the proper materials. Upon completion of a project, each investigator must provide Cedar Creek with a summary of the research (areas utilized, methodology, subjects and results), duplicate animal or plant records and marking systems, as well as a copy of any thesis, and/or any publications resulting from such. His permit should be returned at this time. Please notify the Resident Manager of your arrival in the area.”

On April 10 the Advisory Committee met again under the Chairmanship of Dr. Frenzel. Dr. Lawrence brought up the need for a lichen-flora study again and it was agreed to ask Dr. Clifford Wetmore to conduct such a study. It was announced that the monitoring of pollution levels in Fish Lake, Cedar Creek and Cedar Bog Lake had been completed. Mr. Kuechle reported that a new computer system was to be installed for the radio-telemetry project. Rotation of members and the chairmanship of the Advisory Committee was discussed and a committee consisting of Gilbertson, Grigal and Tordoff was appointed to develop a scheme for rotation.

**Progress Report 1974**

*Education*—Students from 7 state colleges, 3 University departments and from the University of Wisconsin and Colorado State University visited Cedar Creek. There also were students in the area from 7 high schools, and visitors from South Africa, Canada, Denmark, and France. There also were one-day visits by people representing 18 Special Groups. Among them were visitors from Hennepin County Park Reserve District, Minneapolis Tribune, U.S. Fish and Wildlife Service, Warner Nature Center, and Anoka High School Science Teachers and several Boy and Girl Scout groups.

*Research*—In addition to on-going projects there was one on winter productivity of Algae under several light regimes, the testing of new heart rate transmitters with concentration on a long distance telemeter transmitter design, and the study of coexistence on population dynamics of the squirrels centered around the capabilities of monitoring up to 52 animals simultaneously using the automatic tracking system—Tester and Pierson.

The Cedar Creek Advisory Committee, on April 7, 1975, approved a plan to have each member serve a three-year term with a lottery to be used to determine the first staggering terms of 1, 2, or 3 years. One new research proposal was approved to permit David Medvecky to begin a beaver study. The Committee was
reminded by Chairman Frenzel that Cedar Creek operates on overhead monies from Federal research grants amounting to approximately $380,000.00. At this time the State provided an operating budget of only $600.00.

Research—Other research activities included Gastro-intestinal mobility in free-ranging barred owl as determined by radio-telemetry—Mark Fuller and Gary Duke; An examination of the technique of scat analysis in food habit studies on raccoons; Energy requirements of the black-capped chickadee—James Howitz; Survey for the presence of selected species of Rhopalocera of special significance or interest—Ronald Huber and Robert Dana; Effects of radio collars on the behavior of gray squirrels—Anamarie Becheel; Breeding behavior of the short-billed marsh wren—Jeffrey Burns; Spring song bird populations in burned and unburned oak savanna—Jane Cliff; The role of pocket gophers in the structure and function of old field ecosystems—William Grant; Test of equipment and techniques were made in preparation for a research trip in West Africa—Carl Hopkins; and Social behavior of two African dabbling ducks were carried out in flight pens, work done to supplement studies carried out in South Africa by Dr. McKinney. In 1975 169 acres were burned. By this time a total of 600 acres have been burned and vegetative responses studied.

In the telemetry program under the direction of Drs. Tester and Siniff some projects were completed and others continued to be very active. The ecology of raptors studied by Mark Fuller was completed with 20 individuals of four species tracked. Richard Huempfner’s investigation of the winter ecology of ruffed grouse with 54 grouse radio-tagged from 1970-1975. This year the telemetry data were being analyzed in the following categories: 1) total daily activity and the changing patterns of this activity, 2) beginning and ending of activity related to sunrise-sunset and weather conditions, 3) total hectares used by individual grouse by 10-day intervals, 4) shifts in habitat preference relative to snow depth and temperature, and 5) timing and cause of winter mortality.

Interior of the radio-telemetry laboratory, 1981.
As part of the study of the coexistence and population dynamics of tree squirrels by Tester and Pierson their habitat within the boundaries of Cedar Creek were mapped and classified in detail with a total of 148 habitat categories defined. One important phase of the study was an attempt to quantify any effects of general behavior that might be attributed to radio-transmitters. In the further development of an automatic radio tracking system Larry Kuechle and associates found that they could get bearing and activity information on up to 52 animals every 45 seconds, and several improvements were made in the recording system. On receiver design 40 receivers which use a frequency synthesizer in which all channels are phase-locked to a single crystal were built and tested in the field, and progress was made in the development of a versatile heart rate transmitter.

**Progress Report 1976**

There were visits by students from 5 Minnesota colleges, 6 University departments and 12 high schools. Foreign visitors came from Scotland, Australia, Norway, Germany, France, Belgium and Canada. Dr. Jones continued to offer his Macalester winter ecology course.

Among the research activities were the following: Small bird population in burned and unburned sites showed 18 species in control area and 20 on burns, with 9 species unique to the burns and 7 in the control—Jane Cliff; Survey of the Cedar Creek Natural History Area for the presence of species of *Rhopalocera*—a total of 55 species observed and identified—Dana and Huber; Energy requirements of the Black-capped Chickadee—455 marked with colored bands—Howitz; 205 acres burned—Irving and students; Social behavior of two African species of ducks, continued, Cape Teal particularly interesting because there is evidence that the male’s presence probably contributes to duckling survival—McKinney; Other projects continued from 1975.

Drs. Tester and Siniff reported that the Nova 2/10 computer was installed to provide permanent processing of telemetry and weather data. Studies on the coexistence and population dynamics of fox, gray, and red squirrels were in the analysis stage this year. One aspect of the gray squirrel investigation was carried on in the field in 1976. This involved a comparison of daily activity patterns of free-ranging and captive gray squirrels.

One very pleasant event took place in 1976. In December the previous year the National Park Service had approved the designation of the Cedar Creek Natural History Area as a “Registered Natural Landmark.” On June 8, 1976 the presentation took place at Cedar Creek. The program included introductions by Dr. Parmelee, greetings from Dean Richard Caldecott, a brief history by Dr. William Marshall, the impact of Cedar Creek on ecology by Dr. Donald Lawrence and the Certificate presentation by Merrill D. Beal, Midwest Regional Director of the National Park Service. A few very appropriate remarks also were made by the University President, C. Peter Magrath. A large group of people were invited and attended this significant ceremony.

At the first meeting of the Advisory Committee in 1977 on February 28 it was announced by Chairman Frenzel that Dr. Lawrence had specified the $1,000.00 endowment fund given him on his retirement by friends be used for Ecological Plant Life History Studies at Cedar Creek National History area. On November 17 an amendment to the Guidelines for the selection and rotation of Advisory Committee membership was approved. For the two year period beginning November 18, 1977 Dr. Grigal would serve as Chairman and Drs. Frenzel and Tordoff and
Alvar Peterson would be replaced. The amended Guidelines had the following provisions:

"The Cedar Creek Advisory Committee will be comprised of 12 members. Eight members represent the University departments whose research interests are tied closely to Cedar Creek (Botany; Ecology and Behavioral Biology; Entomology, Fisheries and Wildlife; Forestry; Bell Museum of Natural History; Soils; Field Biology Program; and Zoology); three representatives of the Minnesota Academy of Science; and one representative of the staff working at Cedar Creek.

New members of the committee will serve 4-year terms. Each year three members of the committee will be replaced by others from the departments they represent. We suggest that only one representative from the Minnesota Academy of Science will be replaced in any one year. The Chairman of the committee will serve a two-year term and will be nominated and elected by the Advisory Committee membership."

Dean Ibele of the Graduate School appointed Herbert Kulman, Frank McKinney and Larry Kuechle to the committee. The 1977-78 committee then consisted of the following: Lyle Bradley, Anoka Senior High School, Alfred Grewe, St. Cloud State College and Paul Jensen, Carleton College from the Academy and Donald Gilbertson, Frank Irving, Larry Kuechle, Herbert Kulman, Donald Lawrence, Frank McKinney and John Tester from the University with Dr. David F. Parmelee as ex-officio member. There was a further recommendation at the November meeting to have a new committee appointed to develop a Cedar Creek Natural
History Area management plan.

Progress Report 1977

The resident staff consisted of Alvar Peterson and three Teaching Assistants, and Larry Kuechle and six associates. Students came to visit the area from 5 Minnesota colleges, 2 University departments, and from the University of Wisconsin and Lakewood College, Canada (431). Nineteen Special Groups (424) and individuals from Australia, Mexico, Israel and England also were Cedar Creek visitors.

Research—There were several new projects and extensions of old projects underway in 1977. Also, this year marked the beginning of extensive uses of telemetry equipment developed at Cedar Creek for radio-telemetry research in other parts of the country mostly by students of the principal investigators. Among the new projects were: Demography of two non-cycling populations of Micrurus pennsylvanicus—Donna Baird; Circadian rhythmicity in a natural social environment—Michael Connelly; Dragonflies of the Cedar Creek Natural History Area, Ecological relationships in the burying beetles, and records of seasonal flowering times of plants, especially in old fields—John Haarstad; A study of the movements and relationships in a Micrurus pennsylvanicus colony—Anne Householder. Rail pens were used and the transmitters fitted to mice had to be glued on to stay in place; there were 150 hours of movement data and 300 hours of activity recorded for six adults and seven juveniles. During James Howitz’s study of chickadees he made first observation of the local breeding of golden-winged, blue-winged warblers, the hybrid Brewster’s warbler and the blue-gray gnatcatcher at Cedar Creek. Dr. McKinney and his assistant, Jeff Burns, undertook a pilot experiment designed to test whether “rape” in mallards can lead to successful fertilization of eggs; and further studies were made of vocalization and display of Bahama and Chilean pintails; and Robert Taylor obtained a film record of food gathering by raptors by equipping a nest box with an 8mm camera triggered with a switch on the nest perch.

Progress was made in a number of projects carried on by Tester, Siniff and Kuechle. In engineering design and development, work was centered on fish temperature and pressure tags. Work was continued on radio tagging of sea otters at Prince William Sound, Alaska and the Monterey area of California with radio-transmitters attached to 19 otters. The effect of gas super-saturated water in the behavior of migrating salmon was accomplished by the use of pressure sensitive depth transmitters to evaluate travel routes and depth of salmon in the Snake River. A total of 77 antelope were marked with radios and followed during their migratory movements. David Tilman attempted to investigate the functional significance of extra flora nectaries on early successional plants. The relation of extra floral nectar production, the extent of ant visitation and the types of insects causing defoliation were to be studied but the number of species was too rare in 1977.
Management and Program Development 1978-1983

In 1978 the Cedar Creek Natural History Area continued to attract a large number of visitors. There were 630 college students, 592 from high schools and 1244 individuals with Special Groups whose presence in the Area was welcome. On February 8 the Advisory Committee Chairman, Dr. Grigal appointed a committee to work on a long range management plan. They were Frank Irving, John Tester and Donald Lawrence. Some of the items they were to consider were research and education as related to "Unique Areas" and public use of the Area. The 1978-79 Advisory Committee membership was the same as that listed for the previous year.

Research—Among the new projects was one dealing with the caddisflies and aquatic beetles. For the latter 1,946 were collected and identified and an annotated list was prepared. This study was carried on by Gregory Daussin with colleagues Donald Bennett, Gary Check and Paul Hansen. Dr. G. E. Duke, M. R. Fuller and Kathy Daniels developed a new technique to enable them to determine the time of day and the number of times per day that barred owls feed. Bonnie Heidel, a recent graduate of Carleton College, studied water availability and time factors in old field succession supported by a Lawrence scholarship. Dr. Irving continued controlled burning as he had for several years. There was additional botanical research carried out under the direction of Professor Emeritus Donald Lawrence. In one case research on ecosystem development was done on strips 20 x 100 meters. A strip had been abandoned each autumn since 1974 providing strips that had lain undisturbed for 4, 3, 2, and 1 year. John Haarstad and Neil Bernstein did the field work, supported by Lawrence grants. At the ends of the old field transects studied by Bonnie Heidel electrical conduit posts were established with the top 3 feet above the ground. Panorama camera photos were taken from each post and it was planned to repeat these at 5-year intervals.

Dr. Lawrence and Alvar Peterson were engaged in a brome field conversion to native prairie. They set up an extensive study to test the best methods for removing brome and other exotic species such as blue grass, which included burning, plowing, disk tilling and the seeding of areas to native grasses. The studies of captive ducks in flight pens were continued in 1978. Further studies on rape copulations provided proof of fertilization of eggs by males other than the female’s mates. Dr. David McLaughlin continued the studies in the mushroom flora started in 1968 by Margaret Weaver. Dr. Tilman investigated nutrient competition in old field annual plants including the effects of fertilization and special heterogeneity on species diversity and community structure.

Much of the telemetry program was the same, with work outside Cedar Creek Natural History Area on sea otters, salmon, and antelope. At Cedar Creek, Kathleen Zinnel monitored animal movement and activity patterns using a real time computer system and radio telemetry. In summary, field verification of the new Cedar Creek tracking system provided operational evidence of the validity of this approach.

At an Advisory Committee meeting held on February 8, 1978 the main concern of the committee was the development of an overall management policy for the Area. It was recognized as it had been before that the Area as an international,
state and university resource must define its long-term objectives and needs for future development and preservation. Also Dr. Lawrence and Larry Kuechle were asked to form a committee to investigate the presently available base line data for the Area.

Dr. Grigal opened a committee meeting on December 12 by asking Dr. Parmelee for an overall report on Cedar Creek. He stated that the Legislature had provided $42,000.00 to upgrade the telemetry facility, and that a deep well had been dug for the duck pens. He also informed the group that Lawrence Scholarships had been awarded to three students for botanical research at Cedar Creek. In addition, eight “Cedar Creek Stipends” had been awarded to students since spring.

The possible designation of Cedar Creek as a Scientific and Natural Area was considered again. Mr. Jerry Jensen speaking for the State Department of Natural Resources stated that the DNR would have protective control of Cedar Creek but that the operation and management by the University would continue as they are at present. Mr. Jensen stated further that there were four kinds of restrictions concerning visitors at a Scientific and Natural Area designation.

“They are:

1. Public Use for Aesthetic Enjoyment (for birdwatching, viewing wildflowers, etc.)
   —for everyone, kindergarten through college.
2. Educational Use—
   —for students, kindergarten through college and instructors. No public allowed.
3. Research Use—
   —for college students, post graduates and researchers. No public allowed.
4. Public could use the area under special permit.”

A motion was made, seconded, and passed that the Cedar Creek Natural History Area be designated as a Scientific and Natural Area, and that application be made through the University Attorney via Office of the Dean in CBS. Dr. Parmelee stated that the recommendation should be carefully worded and that it should clearly state that the University would continue to control Cedar Creek as it does now.

Dr. Parmelee also reminded the Committee that Cedar Creek was designated a “Registered Natural Landmark” and not a “National Landmark.” He also said that Cedar Creek along with Itasca had been selected by the Institute of Ecology to participate in a future national network of “Experimental Ecology Reserve Centers” for the National Science Foundation.

In 1979 among the visitors were 462 college students from 8 Minnesota colleges and one University department, and 790 high school students. One group of students came from Wisconsin. Fifteen Special Groups were on the Area numbering 800 people and there were one-day visits by 23 individuals. Foreign visitors came from Germany, Sweden and South Africa.

Research—Gary Check completed his study of the life histories of two species of Callibitis Mayflies and produced a revision of the genus. John Haarstad continued his investigation of the ecological relationship in the burying beetles with more than 10,000 individuals taken during the 1979 trapping season. Additional observations made by James Howitz while investigating the dispersal pattern of fledged
chickadees included nesting of the Northern Waterthrush, Nashville, Mourning, Goldenwinged and Brewster's Warblers. He reported that Cedar Creek is extraordi-
nary for the number of birds species that nest at the extreme limit of their breed-
ning ranges. Dr. Irving continued controlled burning and studied the factors
affecting species composition of the Cedar Creek fire management areas.

In the study of brome field conversion carried on under the direction of Dr.
Lawrence areas were disked without preliminary burning. Further plantings of
native bluestem and Indian grass were made by either spreading moveings from a
natural prairie area or by seeding. Additional photographs were taken of the aban-
donment strips at semi-monthly intervals from a car top along County Road 24.

George-Ann Maxson studied the behavioral response of gray squirrels to win-
ter weather conditions and found that the onset of activity was inversely corre-
lated with temperature, particularly on cold winter mornings. She and her
husband, Stephen Maxson, attempted to investigate habitat and home range of
the woodcock during the brood period without success because no nests were
found.

The studies underway by Drs. McKinney, McLaughlin and Morrow were con-
tinued; no results were obtained by Dr. Morrow who was investigating the regula-
tion of herbivorous insect biomass by bird predation. John Seltz, Air Monitoring
Unit Leader, Technical Services Section, Minnesota Pollution Control Agency,
placed an ambient air ozone monitor near the laboratory building—one of five in
the Twin City area. The highest ozone levels were obtained at this site. Dr. John
Tester studied the movements, survival and reproduction of wild turkeys released
at the Carlos Avery Wildlife Management Area.

The efforts of the people working on the Telemetry project emphasized im-
provements in the quality and versatility of radio transmitters, use of microproces-
sors in an automatic fish tracking system, and construction of an automated
system to monitor movements and activities of aquatic mammals in response to
water temperature. Improved radio transmitters were used far away from Cedar
Creek on a variety of species including sea otters, manatees, and walleyed pike.
Temperature data logging system was tested on manatees in the St. John River
near Blue Springs, Florida.

On January 12, 1979 the Advisory Committee received a Land Management
Report from Chairman Grigal. The full report is presented here.

The following are the objectives of land management on the Cedar Creek
Natural History Area:

Cedar Creek Natural History Area (CCNHA) has a distinguished reputa-
tion as a site for ecological research, and this reputation has been con-
firmed by designation of the area as a Designated Natural Landmark of the
U.S. Park Service. A land management plan for CCNHA must recognize
both the use of the area for research and teaching, and the need to preserve
a historically important site. The primary objective of a land management
plan for CCNHA will be the maintenance of the present mosaic of upland
and lowland vegetation types, from forest to prairie, in the area. Compan-
ion goals will be the preservation of biologically distinctive areas and the
restoration of other areas to their pre-settlement status. Maintenance of
the vegetation mosaic does not imply a status quo, but instead means that the
proportion of the area occupied by each type will be approximately main-
tained through the interaction of disturbance and succession.

We recognize that many of the lands of CCNHA do not need active man-
agement at the present time, but rather simply need protection so that natu-
ral processes are allowed to proceed. The Plan, therefore, focuses on lands that require particular attention in the next few years. This should not suggest that other lands on the area are less important.

1) One of the items of highest priority should be management of the old fields in CCNHA that were seeded to smooth brome (*Bromus inermis*) prior to abandonment, and are now almost exclusively in brome. The amount of area covered by this exotic species should be reduced as much as possible in CCNHA, and replaced by native species. Because there are a variety of methods that might be used to accomplish this, and because we have no information on their relative efficacy, we suggest solicitation of proposals aimed specifically at research to develop the most ecologically compatible technique to use to reduce the cover of this brome species. Methods of suppressing other exotic weeds such as quackgrass, bluegrass, sweet clovers, hoary alyssum, and mullein, should be studied also. The research would be funded through one of the CCNHA grants, either “overhead” or “Friends of CCNHA.” While conversion to native vegetation is the goal, some part of each brome field would remain undisturbed to observe changes that occur without manipulation.

2) Another item of high priority is the need to continue periodic abandonment of old fields to provide a continuous series from oldest to youngest for any foreseeable time in the future. We, therefore, suggest that fields that are under cultivation be abandoned at a rate of approximately 10 acres every 5 years. The area or time may vary slightly as dictated by field size and location relative to other agricultural operations. If the suppression of brome mentioned above is accomplished through cropping, then the required rate of abandonment could be satisfied by the resumption of cropping of former brome fields for a period of years.

3) Another item to be considered is the fate of the old fields that are presently scattered throughout CCNHA. We feel that the best course of action to follow at the present time is to allow natural succession to proceed without unnecessary disturbance, unless a particular field is heavily infested with one or more of the exotic weeds mentioned above. This decision will keep our options open and not preclude some as yet unplanned research from being carried out.

4) Another major item that we recognize as being of high priority in the management of CCNHA is the burning program. The present program has evolved over time from a modest beginning, but because of this evolution it can be considered a demonstration/learning project rather than a project with a rigorous schedule of locations and times of burning. We feel that we have accumulated sufficient information about fire effects and fire management on CCNHA that it is now appropriate to move into an actual land management phase.

Burning will be carried out, using spring burns, on two blocks in CCNHA. One block is approximately the east ½ of Sec. 33 and section 34. Attempts will be made to burn this block every three to five years, burning the entire block at the same time and allowing differences in soil moisture, microclimate, and fuel characteristics to govern the intensity of the fire and the actual size of area burned. The area presently being burned on a compartment basis (sections 35 and the south ½ of 26) will either continue to be burned on that patchwork basis or will be shifted to a similar whole block—three to five year schedule after the results of two graduate studies on the area are completed. Preliminary results indicate a shift to whole block management. Our present suggestion is to burn these two large blocks in different years.
5) Other more local problems on CCNHA include the control of white and yellow sweet clovers in one field, the regeneration of a jack pine stand, and maintenance of a field of little bluestem. These problems are also high priority and should be recognized as such. Hopefully, they are problems needing ad hoc solutions and will not occur with sufficient frequency to justify detailed description in a land management plan.

6) Implementation. To be useful, this plan must be implemented. Implementation can be a problem.

The present staff at CCNHA is already overburdened, and it is unrealistic to assume that they can accommodate most of the additional duties suggested in this plan. Parts of this plan should be relatively easy to accomplish and actually reduce duties, such as the new less frequent burning program in large tracts. Other parts, such as the reduction in brome, will require both time and money to accomplish. The plan provides a means of directing work if further funds become available for operation of CCNHA.

With no additional funding, the plan still provides a vehicle for both elevating and directing research to be done at CCNHA. Prospective researchers will be aware of or be directed toward projects that are considered to be high priority items for research at CCNHA. Proposals for outside support will doubtless be strengthened if they refer to and show compatibility with the CCNHA land management plan.

Direct stipends for research from either the CCNHA “overhead” fund or from “Friends of CCNHA” will also provide a means to implement some of these management goals, and to develop more detail on these broad plans. Such questions as precisely what fields to abandon and when, both in terms of year and time of year, need to be carefully considered. This plan will serve to direct some of those activities.

Finally, the plan itself provides some order to the land management activities that are undertaken at CCNHA, and guards against inadvertent disruption of overall goals by single-purpose research or management programs.

On March 20, 1979 the Advisory Committee held a meeting at Cedar Creek, the main purpose for which was to discuss the recommendation by Mr. Mattson of the Physical Planning Office to spend the legislative appropriation of $42,470.00 on the main laboratory building instead of the bioelectronics shop. According to Mr. Mattson current bioelectronics facility was not well suited for reconstruction. There were two major concerns: (1) that if for some reason the telemetry program did not continue to operate at a reasonable level of activity, it should be willing to vacate its newly acquired quarters in the main laboratory; (2) that if the telemetry program, or any other program, expanded its operation at Cedar Creek, the serious matter of space allotment should be settled through committee action, as in the present situation. Committee members agreed that such concerns are warranted and should be acted upon by committees rather than by individuals.

Dr. Grigal then read the terms of the lease proposed by the DNR for Cedar Creek “Scientific and Natural Area” designation which had had his and Dr. Lawrence’s approval with some clarification. Namely, that Cedar Creek buildings and Mr. Peterson’s leased land and hunting rights would be excluded from SNA designation. Otherwise the terms of the lease were approved by the Committee and Dean Caldecott.

**Progress Report 1980**

Professor Jones of Macalester College continued his winter ecology teaching
program. There were 577 students from state colleges and the University in the area. This year students from the University of Wisconsin and Lakehead University, Thunder Bay, Ontario were among the visitors, as were 762 from 19 special groups. Foreign visitors came from Scotland, Australia, Israel, Sweden and England.

Research—T. D. Allison studied the influence of white-tailed deer in the invasion of old fields by woody plants. Preliminary results showed that selective browsing on white pine by deer appeared to drastically reduce white pine invasion and increase the relative importance of invading oak species. Bruce Cutler continued his study of spiders and John Haarstad completed his investigation of the temporal organization in dragonfly communities and the phenology of flowering plants and is currently working on a synoptic collection of Cedar Creek Natural History insects which he has had underway for several years. Bill Hilton, Jr. studied the behavioral ecology of year-round resident and migrant bluejays. He found the density of this species exceeding anything reported in the literature. The data analysis of factors affecting species composition of fire management areas was completed by Dr. Irving and an additional 90 acres were burned. In James Howitz’s study of the energy requirements of chickadees he banded 238 nestlings for dispersal studies. He also notes the first Raven at Cedar Creek and another Sandhill crane nesting. Dr. Lawrence and Alvar Peterson reported that although native plants in the brome field conversion study are still small they have a fair start in establishing Indian grass and big bluestem. They stated that it is planned to burn the entire experimental area in 1981, and that in a new experiment seed was broadcast to see whether seed would germinate under adverse conditions.

The waterfowl social behavior studies of Dr. McKinney and Kimberly Cheng concentrated on these species: Bahama pintails, Chilean teal, and Ringed teal. No progress was made on the regulation of herbivorous insect biomass by bird predation. Dr. Morrow erected exclosures over oak saplings to exclude birds. Michael Penko investigated the population dynamics, growth and nutrition of cattails. Daniel Streeter and Stacy Coffin studied nectar production of Bur oak in attracting ants that might conduct predation on major defoliators. Little was found except for major activity of ants “farming” scale insects. By the middle of the 1980 season Jean Vessal had captured and color marked 28 adults, 63 free-flying hatch year birds and 112 bluejay nestlings. Bill Hilton, David Vessal and James Howitz assisted on the project. Richard Williams completed his study of the microbial aspects of carbon cycling in peatlands.

The telemetry project under the direction of Drs. Tester and Siniff and Larry Kuechle concentrated on five aspects of engineering design and development. They were 1) development of high power output transmitters for monitoring animals from greater distances; 2) improvement and updating of a sonic transmitting and receiving system for monitoring fish and marine animals; 3) design and testing of corrosive links which permit a transmitter to release from an animal at a specific time; 4) development of high frequency transmitters; and 5) development and testing of time delay transmitters. Field efforts involved study of sea otters in California and Alaska and walleyed pike in experimental channels.

When the Advisory Committee met on March 27, 1980 Dr. Grigal asked Dr. Parmelee to bring the committee up to date on activities at Cedar Creek. Dr. Parmelee stated that Dean Caldecott had appointed John Tester chairman of a special Cedar Creek committee to help promote research at Cedar Creek. Other mem-
bers of the committee were Drs. Irving, Parmelee and Tilman. He also mentioned that a proposal on long-term ecological research (LTER) was drafted by several committee members and submitted to NSF in February. An abstract of the proposal will be presented below.

Other activities included the erection of a new storage building in late 1979 and the relocation of the telemetry operation in the part of the laboratory occupied formerly by the staff apartment and a 12-bed dormitory. Over a mile of woven fencing along the southeast section of Cedar Creek was installed in 1979, and Dr. Parmelee said that similar additional fencing all the way to Fish Lake would be installed in 1980, to exclude people and dogs living in the new housing development in that area.

There was considerable discussion regarding the failure of the plan to rotate committee memberships and the election of a chairman. Dr. Tester stated that in his opinion the Cedar Creek Advisory Committee served two purposes: 1) to act as a sounding board for ongoing activities at Cedar Creek; 2) to introduce new faculty to the area. Dr. Irving raised a question concerning departmental representation. He felt that it would be better to have several interested persons from the same department on the committee rather than a broad coverage of disinterested persons representing several departments. The committee gave unanimous approval of this suggestion. The committee also agreed to drop the old zoology position after the 1980-81 term, because the Zoology Department had been eliminated. It also was agreed that the unassigned position should be rotated every four years.

On April 27 the Advisory Committee held its first meeting at the Cedar Creek Laboratory in several years. Dr. Parmelee announced that seven applications for Cedar Creek Stipends had been awarded and that it is understood that the stipends provide only seed money for projects. He also mentioned that a new fund entitled “Friends of Cedar Creek Natural History Area” had been established. The initial funding of $632.04 was received from the estate of Mrs. Edna Mae Carr, and there was some discussion about the need and the means by which additional funding could be solicited.

Dr. Tilman discussed the Long Term Ecological Research (LTER) proposal that had been submitted to NSF. He stated that if funded Cedar Creek would have a full time resident biologist, ½ time computer programmer, ¼ time electronics engineer, and a full time junior scientist. The discussion then turned to the appointment of Dr. Tilman as Associate Director of Cedar Creek since Dr. Parmelee could not be at Cedar Creek and Itasca at the same time. One function of the Associate Director would be to set up a post-doctoral research program at Cedar Creek.

An Advisory Committee meeting was held on June 29, 1981 with the main topic being a discussion of the sites selected by Anoka County to be used as land fill areas. One of the major sites proposed would adjoin Cedar Creek property on the west, immediately adjacent to the duck pens, where noise disturbance would be disastrous to the ongoing behavioral research. The Committee raised a number of other objections which included: Wind erosion and deposition within CCNHA, water pollution including contamination of shallow domestic wells, silting of Cedar Creek, effect of rat poisoning on monitored animals, dust impact, and whether a quarter of a mile would be enough buffer zone. Dr. Tilman was asked to write to various organizations, metro-council and members of state, city and local government offices to express the Committee’s concern. A little later, in August, there was a special Advisory Committee meeting at which material prepared for a
hearing to be held on August 19 was reviewed and revised.

In 1981 Larry Kuechle succeeded Dr. Grigal as chairman of the Advisory Committee. At a meeting held on October 7, 1981 the first item of business was a status report on the 1.5 million dollar research proposal submitted to NSF. Dr. Tilman explained that there had been no decision and that there might not be one for another two or three weeks. This research grant request had been submitted on April 1, 1981. The summary of the proposal, which was over 100 pages long, as prepared by David Tilman and John Tester reads as follows:

"Most current ecological research consists of short-term, intensive studies of a few species or a few ecosystem-level processes, with other system components assumed constant. We believe that major advances in ecological understanding will only come when micro studies of population processes are combined with macro views of whole system processes. Such an approach would allow the synthesis of the direct, indirect, and feedback effects which must form the basis of a mechanistic, predictive approach to ecosystem structure and function.

Succession provides the ideal framework for such a study, for succession is a long-term process which is the result of numerous short-term direct and indirect, and feedback processes. We propose a long-term study of succession at the Cedar Creek Natural History Area, Minnesota. The study would include long-term monitoring of primary productivity, litter accumulation, disturbance, soil processes and nutrient cycles, plant population dynamics, herbivore dynamics, and climatic variability in a series of manipulated and unmanipulated permanent plots. Treatments will be replicated in three different stages in the natural secondary successional sequence. Manipulations include fertilizations with different ratios of limiting nutrients, watering, herbivore removals, several patterns of imposed microsite disturbance, and the exclusion of fire in an otherwise annually burned area. This combination of small-scale microstudies with long term observation of unmanipulated and manipulated areas will provide the experimental and observational data needed to test numerous hypotheses concerning succession and ecosystem structure. Moreover, by performing these studies in the framework of a network of LTER sites, we will be able to address a series of broad, synthetic questions on a geographic scale which was previously impossible."

At the October meeting of the Advisory Committee there was considerable discussion about the status of the six houses at Cedar Creek. Only three of the six are year-round buildings so housing at Cedar Creek was known to be in short supply. Of immediate concern was the request by Dr. Morrow and her post doctorate assistant, David Tonkin, for housing for the 1982 season. It was decided to approve a minimal amount of repairs on the Norris cabin and to look into the possibility of repairing the Skogerboe house after Dr. McKinney had the chance to consider whether its occupancy would interfere with his duck work.

Dr. Tilman reported that he and other committee members had attended several public hearings concerning the proposed landfill near Cedar Creek. The first report indicated that the site was not suitable and that the Minnesota Pollution Control Agency was concerned with all the shallow domestic wells near the site. Dr. Tilman also distributed a rough draft of a policy statement dealing with the manipulation of flora and fauna at Cedar Creek.

Progress Report 1981

There were class visits by 389 students from seven Minnesota colleges, the Uni-
versity of Minnesota and from the Universities of Iowa and Wisconsin. In addition, 248 people representing nine special groups, 19 one-day visits by individuals, and visitors from Canada, Sweden, West Germany, Mexico, Israel and China were guests at Cedar Creek in 1981.

Research—As part of Taber Allison's study of the influence of browsing on *Taxus canadensis* by white-tailed deer a 10 x 40 meter deer exclosure was constructed to protect the Canada Yew near Crane's knoll, south of Cedar Bog Lake. On the prairie restoration project of Neil Bernstein, he covered a 300 square meter plot with black plastic tarpaulin through the 1980-81 winter. All plants beneath it were killed. Jeffrey Brokaw studied the ecology and mating strategies of solitary bees, and the relation between several honeydew producers and their relationship to ants. Thomas Bruns prepared an extensive list of insects associated with species of *Boletus*. Barbara Delaney and Dr. Lawrence reported that there was a 26 percent increase in the number of species in their old field succession strip from 1979 to 1981, and a 21 percent increase from 1978 to 1979. They also found an increase in species diversity with the age of strip.

John Haarstad continued his resource partitioning studies in carrion and dung beetle communities. Among other things he found that some species prefer fresh carrion while others became dominant only after a carcass had been blown by fly maggots. Bill Hilton, Jr., with several assistants, found 181 bluejay nests in 1981, 121 more than the previous year. He had about 700 color marked birds in the area. Dr. Irving supervised the burning of 194 acres in the oak savanna study. In the social behavior investigations of waterfowl Dr. McKinney concentrated again on Bahama pintails, Chilean teal and Ringed teal. His studies showed that the Bahama pintails male territory defense fluctuated in intensity during the breeding season, and that the Chilean teal combines promiscuity with pair bond. The field work on Bahama pintails had led to a proposal for field work in the Bahamas to be carried out in 1982.

Dr. Patrice Morrow will investigate similarity among plots in colonization by arthropods. Three sets of four gardens will be established in which one primary species is interplanted with conspecifics, congenerics, and plants of other families. Three sites were selected and have been plowed, disked and sprayed with herbicide "Roundup" in preparation for planting.

In the telemetry project engineering design and development were focused on refinement and adaptation of existing technologies. These included the design of two types of implantable transmitters, the development of a more efficient sonic tag, and the development of a computer compatible data recorder. Continuing technical support was provided for several projects involving student thesis research on wild horses, sea otters, Wedell seals, polar bears, manatees and mink.

The major research project under the direction of Drs. Tilman and Tester involving experimental and observational data on succession and productivity in a temperate ecosystem was designated as one of eleven LTER projects in the U.S.A. in December 1981. The Cedar Creek project was awarded 1.3 million dollars extending over a period of five years, with potential for renewal.

The Cedar Creek Advisory Committee appointed for 1982-1983 had as members from the University Drs. L. D. Frenzel, David Grigal, Frank Irving, Larry Kuechle, Herbert Kulman, Frank McKinney, Thomas Morley and Patrice Morrow, with Drs. Parmelee and Tilman serving as ex-officio members. The Minnesota Academy of Science selected the following as members of the Advisory Commit-

tee: Mr. William Lacina, teacher, Blaine Senior High School, Dr. Richard Meierotto, College of St. Thomas, and Dr. L. Daniel Frenzel, University of Minnesota. Alternate Academy members are Dr. Wayland Ezell, St. Cloud State University, Dr. Mark Davis, Macalester College, and Dr. Donald Lawrence, Professor Emeritus, but still a member of the University of Minnesota Graduate faculty in Botany. Mr. Lacina was elected chairman of the Advisory Committee.

At the Advisory Committee meeting on January 20, 1982 the first item discussed was the naming of buildings, sites and trails at Cedar Creek. Dr. Tilman presented the following reasons for taking this action: 1) To honor people who had been instrumental in the founding and development at Cedar Creek; 2) the need for place names in identifying important areas that are used frequently by those visiting or working at Cedar Creek. A motion to approve this recommendation was passed. The list of proposed names included Lindeman Laboratory, Peterson Farm and Residence, Norris Cabin Site, Cornies Cabin Site, Skogerboe Residence, Lawrence Trail, Marshall Nature Trail, Beckman Lake Trail, and Fish Lake Trail.

Names of other candidates were Walter Breckenridge and O. T. Walter.

At an Advisory Committee meeting on January 29 the first item discussed was the revised research policy for Cedar Creek prepared by Dr. Tilman. The policy statement was approved in principle with suggested modifications to be sent to Dr. Tilman in February. The Long-Term Ecological Research was discussed in some detail by Dr. Tilman but most of what he said has been reported previously in this document. An inquiry was then made to see whether this might be the time to reaffirm previously established zoning at Cedar Creek but Dr. Tilman pointed out that the small size of the LTER plots, relative to the entire area of Cedar Creek, would not cause zoning problems at this time. It should be recalled that zoning to protect certain areas from undesirable disturbance was one of the first steps taken by an Advisory Committee at least 30 years ago. For example, specific areas along roadsides had been designated for plant collection, with some specific exceptions where collection was prohibited.

At this same meeting Dr. Parmelee stated that because of the LTER project, laboratory and office space would be extremely tight. He said further that he was submitting a proposal to NSF for an addition to the main laboratory building at Cedar Creek, and that meanwhile space in the present facility would be arranged as follows:

1. Resident Manager's office will be converted to a full-time secretary and computer system software specialist area with access to the Records Room. Resident Manager will temporarily occupy Lab 106 until a more appropriate office can be constructed along lines specified by the Physical Plant Operations of the Twin Cities campus.
2. The Resident Ecologist will occupy the Records Room which will be made more fireproof than at present. Important records will be duplicated and kept on the Twin Cities campus as additional insurance against fire and other losses.
3. Postdoctoral researchers will occupy Lab 105.
4. Plant and animal collections will be housed in Lab 107. Not to be used as office space because of health hazard associated with paradichlorobenzene insecticide fumes.
5. Radio telemetry will surrender the large "living" room of the resident biologist's suite, but will retain the men's dorm and bedroom areas. The relinquished space will be converted to graduate student offices.
6. The women's dorm will be converted temporarily into office space for the Principal Investigators and visiting scientists of the LTER program. The present dormitory will be altered to accommodate both men and women until the time when the women's dorm reverts to the main laboratory.

7. No changes are anticipated for the large auditorium and small dark room.

Dr. Frenzel asked several questions concerning the use of Cedar Creek as a base for commercially building radio transmitters and receivers. Mr. Kuechle responded by assuring the group that Cedar Creek is not selling radios and transmitters on a commercial basis but that a corporation exists apart from Cedar Creek and that he was no longer a member of the corporation. Parmelee added that he had advised members of the corporation in writing not to conduct their business on Cedar Creek property, or to compromise in any way the integrity of the Cedar Creek telemetry program.

At an October meeting of the Advisory Committee Dr. Tilman was asked to explain the LTER project. He stated that Cedar Creek is one of only eleven LTER sites in the country that have been funded by NSF to perform long term ecological research, and that if the initial research proves successful the project could continue for several years. The LTER at Cedar Creek centers around secondary succession of plant and animal interaction through time.

At this meeting it was reported that there had been 40 applicants for summer work and 12 were selected, including significant numbers from local colleges other than the University. The Visitor Policies and Regulations were then discussed and those set up by Dr. Marshall and updated by Dr. Parmelee were distributed for review.

Dr. Parmelee stated that several people had suggested that it might be a good idea to have a one-day open house for high schools during the spring and fall each year, and Dr. Davis suggested that there ought to be an instructors' workshop held at Cedar Creek. Dr. Parmelee also referred to a letter he had received in October from Gordon Murdock, Director of Public Education at the Bell Museum. Dr. Murdock indicated that he hoped to conduct a pilot minicourse aimed at teaching family groups a little about natural history under winter conditions, and suggested that one segment might be held at Cedar Creek.

The final item on the agenda of this meeting was the question of the use of land by researchers and students for gardening. It was agreed that one area of land could be used for this purpose with the recommendation that the plot should be located away from the laboratory for aesthetic reasons.

**Progress Report 1982**

*Education*—There were 383 students from Minnesota colleges who visited the Area in 1982, and 38 from out of state colleges. There also were 390 individuals from special groups and 46 individuals who enjoyed one-day visits at Cedar Creek. There were 20 foreign guests from England, Canada, Netherlands, Norway, Finland, Japan and Australia.

*Research*—In addition to research projects reported before there were some new ones described. Suzanne Braun investigated the dynamics of rodent populations through succession. She live-trapped small mammals in four LTER sites to obtain data on their presence and abundance before fertilization in macroplots.
One interesting result was the discovery that the small mammal fauna at Cedar Creek differed markedly among the four LTER sites trapped. Lawrence Heaney and Dr. Elmer Birney prepared a provisional checklist of the mammals of the Cedar Creek Natural History Area. Each of the 61 species was identified as being either common, uncommon or possible.

Drs. Bruce Cutler and William Schmid carried on research on the cold tolerance mechanism in jumping spiders, and Rebecca Goldberg collected insects on the four LTER sites to establish records of insect communities on the fields. She used a variety of sampling methods including sweep nets, hand collecting, Berlese funnel, pitfall traps, sticky traps and vacuum sampling. Billy Goodman studied spittlebug-host plant relationships, and John Haarstad collected ground insects in a series of strips of an abandoned rye field which had been monitored since 1978 for changes in plant composition. In another study Drs. Nancy Hunty and Richard Inouye investigated the relationships between plants and the herbivores that fed on them. Their largest effort to date was to study the growth and reproduction of plants in the absence of one or more groups of herbivores: aboveground mammals, below-ground mammals, foliage-feeding insects, and root-feeding insects. To exclude or remove the animals they used fencing or insecticide treatments.

Drs. P. A. Morrow, P. W. LeQuene and D. W. Tonkin developed a project to determine whether a diversity of plants provide protection for each against insect pests. They varied the diversity of native plants in 12 experimental gardens and monitored them for colonization and population growth of insects. Over 100 species of arthropods invaded the gardens in the first summer. Their preliminary analyses indicated that replicate gardens gave consistent results, within gardens there was no edge effect, insects prefer the larger plants and plant size was a major source of variation in insect numbers between treatments, and that when plant size was factored out generalistic insects reach their highest densities in the monoculture, as they had predicted.

The progress report of the Cedar Creek telemetry project indicates a very active program again in 1982 with most of the investigation taking place far from Cedar Creek National History Area. The program under the direction of John Tester, Don Siniff and Larry Kuechle was carried out with seven colleagues and eight graduate student assistants. The location of field studies ranged from the Antarctic to the Arctic and from north central Minnesota and western states to Florida. The studies carried on in these distant sites all were made possible by the use of equipment and technology designed, developed and tested in the Cedar Creek biophysics laboratory.

In an article published in a 1982 Northwest Area Foundation Newsletter, Mark E. Haidet, Research Historian for the Foundation (formerly the Hill Family Foundation) reviewed the role that the Hill Foundation played in the initial support for the radio-telemetry program at Cedar Creek. Dr. Dwain Warner had been much impressed with the success the Soviets had had when they launched a dog into space and monitored its behavior with radio transmitters. This caused him to think in terms of monitoring animals in their natural environment. Interested field biologists met with Dean Spilhaus and faculty members from several departments in the Institute of Technology to discuss the possibility of developing tracking systems. In 1958 Drs. Warner and Tester approached the National Science Foundation for support and NSF responded negatively—the project was “too wild” it claimed. Discouraged but still determined they approached A. A. Heckman, then
Director of the Hill Foundation, and he was very much impressed with the idea and the inter-disciplinary nature of the project and encouraged the University to submit a grant application. In 1959 the Hill Family Foundation awarded the University $40,000.00 to begin the project. In summarizing the Foundation’s impact on the project Mr. Kuechle stated that the Foundation was the catalyst which made possible the transition from an idea in somebody’s mind to a working tool capable of providing information necessary for answering questions concerning animal behavior and wildlife management. Mr. Haidet also called attention to the fact that the University of Minnesota’s biotelemetry program is the largest in the world and has influenced biological studies the world over. Many countries have established similar programs, many with the assistance of program personnel or people trained at the University.

In the same Foundation Newsletter article, Mark Haidet also described, with reason for pride, the role that the Foundation played in supporting the project “Some Energy Relations of Terrestrial Ecosystems” developed by Drs. Donald Lawrence and J. Roger Bray. The studies at Cedar Creek focused on two areas—biomass production and water use of various plant communities. In all, 16 articles were published on the research conducted at Cedar Creek. Mr. Haidet went on to say that the project’s most significant impact on the scientific community was the International Biological Program’s decision to adopt the project’s theme as its own.

Dr. J. Derrick Ovington, a British botanist at the British Nature Conservancy, who spent a year in the Cedar Creek project, helped to develop the study’s methodology. In 1964 he was able to persuade the International Biological Program to study the productivity of natural ecosystems throughout the world.

The research project entitled LTER: Micro and Macro Views of Succession, Productivity and Dynamics in Temperate Ecosystems under the direction of Drs. Tilman and Tester with three colleagues got under way with the selection of four sites where most of the research will be carried on. From among the 78 described old fields in the Cedar Creek Area they chose three based on successional age, size, location, topography, plant species composition and soils. They also selected part of the native oak savanna which had not been subject to agricultural disturbance. This gave them a 15-year old field, a 25-year old field and a 50-year old field and an undisturbed area. The manipulations in these sites were designed to allow the group to determine experimentally the direct and indirect effects of plant nitrogen competition, plant light competition, insect herbivory, mammal herbivory, and climatic variations. During 1982 they obtained a massive amount of base line information on the soils, plants, insects, mammals, productivity and disturbance regimes in the four successional stages. A Cedar Creek Outside Advisory Committee met for two days in May at Cedar Creek and made a number of technical suggestions on sampling, precipitation collection and spatial scale for the experiments. In a related study Sara Webb investigated the distribution of seeds in space and time within three Cedar Creek plant communities (old field, prairie, oak savanna). Her major objective was to elucidate how constraints on seed dispersal influence plant community structure and composition at various spatial scales.

Another part of the LTER project was research on the Ecology of the Plains Pocket Gopher, Geomys bursarius in Old Field Ecosystems. Current studies made by Dr. Tester and K. C. Zinnel and three colleagues indicated that pocket gophers are the most important consumers in old fields. They point out that modification of
existing telemetry facilities by the Cedar Creek Bioelectronics Laboratory will make it possible to monitor pocket gopher movements above and below ground throughout the year. In addition to testing different transmitter attachment methods captive gophers were observed in the laboratory so that the investigators would be more familiar with their behavior and to assess how much they eat.

In January of 1982 Dr. Lawrence wrote to both Mr. Harrigan, Executive Director of the Minnesota Academy of Science, and to Dr. Parmelee to call attention to some administrative matters which concerned him. He pointed out to them that the three Academy members of the Advisory Committee had served continuously for 11 years. It had been decided earlier that Academy members would serve three-year terms. Dr. Lawrence also questioned the changes in the use of Laboratory space at present and proposed for the future. He was referring to the use of the space now occupied by the Bioelectronics Laboratory which had been a faculty apartment and a dormitory with bed space for 24 students. He also had reference to the plan to make office space out of the fireproof Record Room designed to store archival material and to subdivide the large multipurpose auditorium into cubicles to provide office space for assistants. To date the latter proposal has not been acted upon. He proposed, to relieve congestion, to have a temporary building attached to the eastern end of the auditorium. As will be mentioned later a permanent building will be constructed instead of the temporary structure that he suggested.

In November of 1982 Dr. Lawrence prepared a document for the Advisory Committee in which he expressed some thoughts regarding the Administration of the Cedar Creek Natural History Area. In it he reviewed material written by Dr. Arthur Wilcox and published in volume 18 of the Proceedings of the Minnesota Academy of Science in 1950. He also presented some constructive criticism in one paragraph dealing with “Some deficiencies in administrative objectives that have developed.” They are quoted below.

“In more recent years several of the guide-lines set forth in the UM-MAS agreement appear to have been eroded or abandoned. 1) Numerical voting balance between the UM-MAS representatives on the Advisory Committee has become distorted (UM 9, MAS 3); 2) for 11 years (1971-1982) the provision for new MAS representation lapsed and the MAS membership unchanged; 3) several major decisions have been made and carried out without being brought in advance to the attention of the Committee; 5) numerous research reports (or even their titles) have not been transmitted to the Committee, except perhaps through mention in Annual Reports; 6) copies of research reports and reprints of published articles have not been filed routinely in the library of the Bell Museum of Natural History. With the removal of the document files formerly housed in the CCNHA Lab Record Room and Administrative Office the provisions of item 6 are of critical importance, and are in need of immediate reaffirmation and action; 7) Meetings of the Committee have not always been held at least once per quarter.”

Dr. Lawrence also mentioned that already by 1950 it was recognized by the Advisory Committee that observational research alone would not solve many important problems of field biology that researchers might wish to study in the Area, but he emphasized that administration must seek to minimize both the loss or depletion of plants and animals through fire, hunting, collecting or other disturbance and also the undesirable alterations arising from overpopulation, invasion, or the introduction of exotics. Dr. Lawrence went on further to call attention to the need for surveys to provide a record of the current status of plant and animal distribu-
tions for the whole Area. He said that in his opinion it will not be possible for the Committee to make wise decisions about the kind and amounts of experimentation to allow in any given kind of ecosystem or specific tract, until a more comprehensive survey and mapping of ecosystems is completed.

On January 4, 1983 Dr. David Tilman presented a more complete recommendation to the Advisory Committee regarding place names at Cedar Creek. In the opening paragraph he stated:

"The increased usage of Cedar Creek in the past years has highlighted a long-standing problem: few of the roads, trails, paths, buildings and areas within Cedar Creek Natural History Area have names. The lack of names has made communication more difficult than it need be. How much easier it would be to have a commonly agreed upon vocabulary than to have to describe the location of each road or trail in detail.

The naming of roads, trails, paths, buildings and areas is thus an administrative necessity. Moreover, it is an opportunity to honor some of the many individuals who have been instrumental in obtaining, establishing and operating Cedar Creek over the past decades. Clearly, there are many more people who could be thus honored than there are suitable areas to be named. I would like to suggest some criteria to be used in deciding what to name something, in order of importance."

He suggested names in common usage, individuals who had been important in establishing an area or building and those who had donated land or buildings, and finally the general contribution of an individual to Cedar Creek with some bias in favor of those individuals involved early in Cedar Creek's history.

**Buildings**

With the exception of the following buildings. I suggest that no honorific names need be given to Cedar Creek buildings. Specifically, residences other than those listed below should not be named after individuals at this time, but be known as the residence of the current occupant. Such a notation should be made on our maps, and updated as necessary.

*Lindeman Laboratory*—Of all the ecological research which has occurred at Cedar Creek, the work of Raymond Lindeman stands out as having the most impact on the field of ecology and as making Cedar Creek Natural History Area known world-wide. It is most fitting to honor this highly creative and active researcher who died at so young an age by naming our research building after him.

*Peterson Residence*—In honor of the Peterson family, who farmed much land which is now a part of Cedar Creek and especially in honor of Alvar Peterson, who served so ably for so many years as the Resident Manager of Cedar Creek Natural History Area, it is most fitting to name his former residence the *Peterson Residence*. Additionally, the land which was once a part of his farm should be named the *Peterson Farm*.

*Norris Cabin*—In keeping with common usage and to honor Julia Anna Norris who donated her cabin and land to Cedar Creek, this cabin should be named the *Norris Cabin*.

*Cornelia Cabin*—In keeping with common usage and to honor the Conneals’ who donated their cabin and land to Cedar Creek, this cabin should be named the *Cornelia Cabin*.

*Skogberge Cabin*—In keeping with common usage, this former residence, which is now used for storage and as temporary office space, should be named after the individuals who sold it to Cedar Creek.
Trails and Paths

Lawrence Trail—In honor of Dr. Donald Lawrence, an emeritus member of the Botany faculty, who performed much of his research at Cedar Creek, who donated 340-acre sections of land to Cedar Creek, and who has continued to support Cedar Creek through his encouragement of research, his leadership in starting the old field abandonment project, and his participation on the Cedar Creek Advisory Committee, let this be known as the Lawrence Trail.

Cooper Trail—In honor of W. S. Cooper, the eminent Minnesota ecologist who spotted Cedar Bog Lake from the air and decided that it would be an excellent location for ecological research, let the trail leading to Cedar Bog Lake be called Cooper Trail.

Marshall Nature Trail—In honor of Dr. William Marshall, who served as Director of Cedar Creek Natural History Area and who established the nature trail, let this be called the Marshall Nature Trail.

Wilcox Trail—In honor of Dr. A. N. Wilcox, the first director of Cedar Creek Natural History Area, let this road be called the Wilcox Trail.

Cornice Branch—In keeping with common usage, let this branch of the Wilcox Trail be called the Cornice Branch.

Lundgren Branch—In keeping with common usage and to acknowledge the activities of the Lundgren family in homesteading this land, let this be called the Lundgren Branch of the Wilcox Trail.

Buell Trail—To honor Drs. Murray and Helen Buell, who established the transect through Cedar Bog which was later used by the Lindemans, Gorham, and others in their research, let this road be called the Buell Trail.

Beckman Lake Trail and Fish Lake Trail—These names reflect current usage, and should be formally recognized. As appropriate in the future, each could be named after an individual.

Place Names

There are many fields and tracts of land which have come to be called by a specific name, such as Sewing Machine Hill, Lawrence's Old Fields, Crone's Knoll, and Bray's Savannah. I suggest that we agree on these and mark their general location on a map of Cedar Creek, but that we not enshrine them by placing signs to that effect. The only honorific name I would suggest for a field at Cedar Creek is the Peterson Farm. Other names should reflect common usage, and the map should be periodically updated so as to be useful to investigators at Cedar Creek.

At a March 15, 1983 meeting of the Advisory Committee it was agreed that Dr. Tilman, Associate Director of Cedar Creek, should be added to the Committee as an ex-officio member and Mr. Lacina was elected as the new chairman. Dr. Parmelee announced that Dr. Tilman had been notified by NSF that Cedar Creek was awarded a $100,000.00 grant for additional laboratory and office space. Matching funds, $25,000 from the Freshwater Foundation and $35,000 from the University completed the necessary funding. Ground breaking took place in early September. Dr. Parmelee also announced that David Bosanko had been hired as Resident Manager to replace Alvar Peterson who retired on February 4. Mr. Bosanko had been employed at the Lake Itasca Forestry and Biological Station as Resident Biologist for nine years.

On the afternoon of January 29, 1983 there was a reception held in the Cedar Creek Natural History Area Laboratory honoring Alvar Peterson who was retiring
after 26 years of outstanding and dedicated service. He was presented with gifts including field glasses, a camera, and a "Lutefisk" fishing pole and reel hand carved from wood by a graduate student, John Haarstad. This fishing tackle gift also included instruction for its use.

In March of 1983 Dr. Parmelee wrote to Dr. Robert Holt, the new Dean of the Graduate School, to call his attention to the role of the Dean in the approval of prospective members of the Advisory Committee. Among other things Dr. Parmelee had this to say:

"Cedar Creek is humming with research activities these days. In 1977, as a result of an intense evaluation of field stations across the nation by the Institute of Ecology under the auspices of the NSF, Cedar Creek was designated one of 67 Experimental Ecology Reserves (EER) in a national network. At the same time our Lake Itasca Forestry and Biological Station was designated an EER. In 1981 NSF named Cedar Creek a Long-Term Ecological Research site, one of only 11 in the nation. A $1.3 million subvention followed, and within the past few days NSF awarded Cedar Creek an additional $100,000 for laboratories and offices."

Dr. Parmelee could have added the fact that the LTER grant made it possible to employ a long sought after Resident Ecologist. The position was advertised nationally and, following a critical review of several hundred applicants, Dr. Mark Stillwell from Fort Collins, Colorado, accepted the position on a post-doctoral appointment.

In 1982 Dr. Tilman prepared a provisional Research Policy statement with the request that members of the Advisory Committee comment on its contents. This proposed revision was reviewed on April 13, 1983 at an informal meeting of the Advisory Committee and according to a paragraph at the end of the revision it was adopted by the Cedar Creek Advisory Committee at that time. It was pointed out that all policy statements are subject to revision by the Cedar Creek Advisory Committee, and that major revisions are likely once an inventory of habitat types at CCNHA is completed.

In addition to a general statement regarding requests to carry out research in the area the new Research Policy spelled out the procedures and restrictions which must be considered when environmental manipulations are to be carried out. In particular the policy stated that for any given field (or patch of a given habitat type) at least one half of the field would be maintained in an unmanipulated state indefinitely, with the exception of fire which was a natural influence and is necessary to maintain some vegetative types. In cases in which the habitat type to be manipulated is rare or is of great importance, or for some other reason, the proportion of the area to be manipulated may be restricted to a much greater extent.

In 1983 Dr. Parmelee prepared an excellent Progress Report of the Cedar Creek Natural History Area which was published in Vol. 49 of the Journal of the Minnesota Academy of Science. In it he reviewed the various activities during the 1970's, many of which have been referred to on previous pages in this document, but deserve repeating. The following statements extracted from his Report will touch on policies and activities that he considered to be most noteworthy. Among them is a 1982 revised Visitor Regulation.

"The uses of the Cedar Creek area ordinarily fall into one of four general types.

1. Exploratory—Educational and scientific groups, conservationists, researchers, teachers, etc. becoming acquainted with facilities, landscape,
flora, and fauna for possible future demonstration or study.

2. Teaching—Organized field trips and demonstrations. Groups are limited to no more than 20 individuals unless granted special permission. The Field Biology Program’s graduate teaching assistant assists groups whenever possible. During periods when a TA is not available, qualified group leaders may conduct their own tours. Prospective group leaders are urged to attend an orientation workshop offered at Cedar Creek every year on the third Saturday in April.

3. Research—Independent researcher, faculty member, undergraduate or graduate student from within or outside the University of Minnesota studying a specific problem, which he or she proposes well in advance to the Program Director, and carries out according to a plan approved by at least three members of the Advisory Committee.

4. Nature Trail—A designated Nature Trail is provided for public use, and those using it are required to stay within its boundaries. No permit is required.

Dr. Marshall had seen the need for this Trail to make at least one area available to the general public; furthermore, availability to the public was one of the conditions for the grant of LAWCON funds used for acquisition of property. It is located on the east side of Fish Lake.

Most of Cedar Creek’s 5,300 acres (2,185 hectares) were acquired through gift or purchase during the early days of its history. According to Dr. Marshall (1968) the last major purchases were consummated in 1967 for lands adjacent to Fish Lake, including a public nature trail. No further land acquisitions have been made since then, even though several 40-80 acre plots are thought desirable to fill out conspicuous indentations of Cedar Creek’s western edge.

Dr. Parmelee also gave special attention to the designation of the Cedar Creek Natural History Area as an Experimental Reserve, as a Long-Term Ecological Research site by NSF, and in December 1975 as a Registered Natural Landmark by the National Park Service.

One administrative action referred to by Dr. Parmelee was the appointment of Dr. David Tilman in 1980 as Associate Director of the Cedar Creek Natural History Area. Dr. Parmelee who is Program Director for the College of Biological Science had to wear two hats; one as Director of the Itasca Biology Sessions and one as Director of the Cedar Creek program. Since it was imperative for him to be at Lake Itasca during the summer sessions, it left Cedar Creek without adequate supervision during its most important season. With the appointment of Dr. Tilman this problem was solved.

Dr. Parmelee listed a number of projects that were completed in the 1970’s which will likely influence many studies in the future. They were a catalog of the flora of Cedar Creek by Moore (1973); a comprehensive and significant report on Cedar Creek soils by Grigal, et al. (1971); vegetation mapping by Huempfner and Erickson (1975); land management report by Grigal, et al. (1979); problem analysis and preliminary plan for expansion of the fire management unit by Irving (1980), and Research Policies of the Cedar Creek Natural History Area by Tilman (1983).

Dr. Parmelee called attention to the building program. Two additional buildings were built in the 1970’s: in 1976, a 68m² garage that houses a tractor and accommodates woodworking equipment, and in 1979 a 223m² storage building. Materials for both facilities were purchased from overhead monies generated at Cedar Creek, and station labor was employed when feasible. Other major expen-
ditures of the 1970's were the installation of underground electrical lines and transformers to the Cedar Creek Laboratory, a Data General Nova 2 computer, and a deep well that feeds a copious supply of water to Dr. McKinney's duck enclosures.

Progress Report, 1983

Education—There were 220 students from Minnesota colleges visiting the area in 1983, and 28 from out of state colleges. The number of people representing special groups, consisting mostly of high school students, was 664, and there were 39 individuals who enjoyed one-day visits at Cedar Creek. There also were foreign visitors from Sweden and Australia.

Research—There was some new research but many of the 1983 investigations were the same as reported for 1982 with current results and expansion of project activities in a number of cases. Taber Allison continued his study of the influence of deer on the reproductive biology of Canadian Yew, and added measurements of other woody plant growth in and outside of deer exclosures. His preliminary analysis showed no significant difference in the height of woody plants, but that there were differences in yew strobili production, there being 90.3% in the exclosures, and 51.4% in the controls of the estimated male strobili production. Jeffrey Brokaw found that both caterpillars from which ants were excluded, and caterpillars tended by ants but restricted to day resting spots on the trunk and branches of their host suffered significantly higher rates of parasitoid attack than control groups. Drs. Bruce Cutler and William Schmid continued their study of cold tolerance in jumping spiders.

Robert Dana started his investigation of the courtship-mating behavior of Hesperia leonardus by collecting and then placing larvae in enclosures for the winter. Rebecca Goldberg trapped ground beetles in LTER fields and while most of the data are still being analyzed it appears that cicindelid beetles showed a negative response to soil fertilization while other beetles showed no response. She also studied grasshopper predation by blister beetles. The principal finding in 1983 was that there was a significant difference in the density of grasshopper egg pods in fertilized and unfertilized plots. John Haarstad started a new study on the family Tingidae with the purpose of obtaining data on host preference and life cycle information. Frank Irving and others continued to investigate the vegetative responses of trees and shrubs to prescribed burning. In 1983, 83 hectares were burned.

Amy Loiselle started an investigation to evaluate a technique for core-water sampling in peatlands and Mark McKone and David Grigal started to determine how root dynamics at the species and community levels relate to old-field succession. The waterfowl behavior studies under the direction of Frank McKinney were continued. Jeffrey Burns collaborated with Dr. Gary Duke and Larry Kuechle on the design of a method for monitoring oviduct activity in ducks, and Gwen Brewer began a study of vocal communication in Ringed Teal.

Mark McKone measured the occurrence and magnitude of nitrogen fixation in association with a variety of plant species. Preliminary results suggested that fertilization reduces levels of associative nitrogen fixation. He also studied patterns of sexual allocation in the genus Bromus. Patrice Morrow and associates continued their investigation to determine whether a diversity of plants provides protection against insect pests. The results were the same as those reported in 1982. Michael
Norland and David Grigal planned a research project to determine the role of soil characteristics and light attenuation efficiency in controlling primary productivity in forests and fields. Sharon Strauss continued her study of the interaction of sumac and its herbivores. She shifted the emphasis from only beetle herbivores to include the effects of deer browse. She also investigated the effects of fertilization of *Artemisia ludoviciana* on the numbers and species of insects on these plants and found significant differences. As part of this study she offered beetles plants from fertilized and unfertilized plots to determine the effect of high nitrogen on beetle feeding preference.

On the radio-telemetry project under the direction of John Tester, Donald Siniff and Larry Kuechle, the engineering design and development in 1983 were focused on the application of existing technology to meet specific project needs. For example, a major effort was directed toward developing transmitters for implantation in sea otters. A new major research effort was begun on sea otters in California and Alaska.

A new study, throughfall/stemflow chemistry and soil weathering rates, was initiated by scientists of the Minnesota Pollution Control Agency and the University Soil Science Department who are interested in the acid rain problem.

David Tilman and John Tester reported on 1983 investigations on succession, productivity and dynamics in temperate ecosystems (LTER). Their review of the results of the 1983 season was very extensive so their summary of accomplishments will be given here.

A. Contrary to the generalizations in the literature, old field soil nitrogen and organic matter decline for the first 15 years post-agriculture, and then increase. This may be caused by changes in the ratio of labile to resistant soil organic matter.

B. Fertilization of old fields and native, undisturbed vegetation has shown that N was the only limiting resource of N, P, K, Ca, Mg, SO₄, Cu, Mo, B, Fe, Co, Mn and H₂O.

C. Studies of both fertilized and unmanipulated vegetation in 4 different fields have shown that light availability at the soil surface is strongly inversely correlated with soil nitrogen. This means that nitrogen and light form a natural "resource ratio gradient."

D. Almost all of major plant species in all 4 experimental fields responded statistically significantly to the imposed nitrogen gradient, suggesting physiological "tradeoffs" in their ability to compete for N and light.

E. Because plains pocket gophers were significantly more active in microplots and macroplots receiving high levels of nitrogen fertilization and because the soil disturbances caused by gophers were dominated by annual plants, this herbivore had a highly significant effect in reversing the normal successional sequence.

F. *Microtus* and *Peromyscus* responded significantly to micro plot fertilization, demonstrating small-scale microhabitat specialization by these small mammals. Similar patterns were observed for various insects (membracids, grasshoppers, chrysomelids).

G. In total, our experimental studies show a strong interplay of soil development, plant resource competition and herbivory in structuring the ecosystems at Cedar Creek.

There have been a number of collaborative research efforts including visits by LTER staff members to the Konza Prairie project and the Central Plains, Niwot
Ridge and Jarnada sites. As the result, additional cooperative studies are being planned with Konza which involve nitrogen fertilization and the role of grasshoppers as foragers, and at the other sites cooperative projects on nitrogen fertilization and the role of soil renovation are being established. A cooperative project in progress with David Grigal of the Department of Soil Science and Edwin Schmidt of the same department has opened an interest in cooperative research in the area of microbial decomposition. K. C. Zinnel with Larry Kuechle and associates investigated fossorial movement and behavior of the plains pocket gopher by monitoring their movements by radio-telemetry. The field installation of a prototype gopher tracking system was completed in November and eight gophers were tagged with surgically implanted radio transmitters. The gophers appear to be winter active and are aware of the activities of other individuals.

It had been my intention to terminate this historical account of the origin and development of the Cedar Creek Natural History Area with the 1983 Project Report and an Epilogue. But in February of 1984 there was a change in the Administration of Cedar Creek which had been supervised by the Director of the Field Biology Program since the time the Program was established with the appointment of Dr. Marshall as its first Director in 1966. The change referred to was to terminate the Field Biology Program as an administrative unit as is implied in the letter addressed to University personnel by Dean Caldecott on February 27, 1984. Dean Caldecott had this to say:

"During the past several years, the research programs at the Cedar Creek Natural History Area and the use of the Itasca Forestry and Biological Station have grown to the extent that their administration has become unusually complex. Following conversations with Dr. Parmelee, who has been the Director of both programs for fourteen years, we decided that it would make eminently good sense to separate the administration of these two field stations. Fortunately, Dr. John Tester has agreed to oversee the administration of Cedar Creek, and Dr. Parmelee will continue with the responsibility for the management of Itasca. Therefore, effective immediately, I would request that those among the faculty and staff who use the Cedar Creek facility deal directly with Dr. Tester. In the same way, all who are involved with the Itasca program should continue to work with Dr. Parmelee."

As has been said by one of my friends, "An author never finishes a book, he merely abandons it."
Others who have made significant contributions to education, research and development at the Cedar Creek Natural History Area

David Mech, Ecology and Behavioral Biology, U. of M. 1968
Daniel Frenzel, Fisheries and Wildlife, U. of M. 1973
James Jones, Macalester College
Margaret Weaver, Mycology of CCNHA. 1960
Harvey Gunderson, University of Nebraska. 1951
David French, Plant Pathology, U. of M. 1967
Beverly Medvecky, Cedar Creek Natural History Area, 1984

Vernon Ausen, University Real Estate Coordinator, 1969

Martha Crone, Curator of the Eloise Butler Wild Flower Garden, 1953

David Tonkyn, Research Associate with Dr. Morrow, 1984

David Bosanko, appointed Resident Manager, 1983
Epilogue

Even with all its natural attributes the Cedar Creek Natural History Area was likely to have been lost to logging, farming and housing were it not for a number of dedicated people who contributed in many different ways to its purchase, preservation and development. At the risk of omitting someone of consequence I will mention briefly the role played by several of the leading actors on this stage.

Those who were much involved in discovery, land acquisition, the joint agreement for cooperative management by the Minnesota Academy of Science and the University, and the early program developments were the following: W. S. Cooper, Cora Cornia, O. T. Walter, D. B. Lawrence, A. N. Wilcox, and University Presidents Guy Stantion Ford and Walter C. Coffey. Others who made very important contributions toward management and fiscal support as the project got under way were President Morrill, his Administrative Assistant, Stanley Wenberg and Dean Blegen.

The Cedar Creek project owes much to Dean Fenske and Alvar Peterson for their managing of the physical plant operations and to Dr. Borchert for his successful efforts to obtain legislative support for land purchase. Drs. Marshall and Parmelee provided exemplary leadership during their tenure as Directors. Dr. Marshall should be commended for his very diplomatic and successful effort to persuade land owners to sell their property to the University, and for his encouragement of both teaching and research activities. Dr. Parmelee was instrumental in obtaining national recognition of the Area and for acquiring funds for essential capital improvements.

The research and teaching contributions of many staff members and students have been described on previous pages, but because of their involvement in major projects some people will be mentioned again here. They are Drs. Dwain Warner and John Tester, leaders of the radio-telemetry project with invaluable assistance of William Cochran, Larry Kuechle who designed and developed equipment, and David Mech who carried out extensive field testing of equipment; Dr. Frank McKinney, leader of the waterfowl behavior studies; Dr. Frank Irving for his supervision of the burning of areas to maintain savanna types and grassland in the property; and Drs. David Tilman and John Tester who planned what promises to be an important investigation of succession, productivity, and dynamics in a temperate ecosystem. Drs. Frenzel and James Jones conducted very successful Macalester College student winter ecology class sessions at the Cedar Creek Natural History Area for several years. Beverly Bonde Medvecky deserves special mention here for her long service in maintaining the library facility and report files and for tolerating so faithfully the tedium involved in locating the positions of animals from film on which the signals were recorded, and for general help in answering phone and other housekeeping and clerical chores. There have been a great many other people who have made significant contributions to research and teaching at Cedar Creek; too many to attempt to prepare a complete list.

I wish to acknowledge a major contribution by Dr. Donald Lawrence who provided the author with correspondence and printed matter concerning the background events described in the first section of this historical account, and for the photo illustrations.
APPENDIX I

AGREEMENT entered into this 11th day of December, 1942, by and between the Minnesota Academy of Science, Incorporated, hereinafter referred to as the Academy, and the Regents of the University of Minnesota, hereinafter referred to as the University. WITNESSETH.

In the months of March and April, 1940, certain letters were exchanged between A. N. Wilcox, chairman of the Academy's Committee on the Preservation of Natural Conditions, and Guy Stanton Ford, then President of the University of Minnesota. Copies of these letters are hereto attached and marked Exhibits "A," "B," and "C" respectively. These letters are referred to for the purpose of outlining and explaining the background of the subject matter of the following agreement, but are not to be taken in any sense as binding or committing the parties hereto to any specific obligations with reference thereto except as they may be embodied in the terms of the agreement hereinafter set forth.

Pursuant to his correspondence the Academy has acquired and transferred, or will acquire and cause to be transferred, to the University by proper deeds of conveyance certain lands containing approximately 160 acres located in Anoka and Isanti Counties in the State of Minnesota in Township 34 North, Range 23 West, the said lands forming a part of the tract referred to in the third paragraph of letter "Exhibit A." In addition certain individuals have likewise transferred or will hereafter likewise transfer to the University, lands in the same area subject either to a life estate reserved to the grantors, or under an agreement whereby the University has leased or will lease back to the grantors for life the land so conveyed by such grantors.

NOW, THEREFORE, in consideration of the grant to the University of the lands above referred to, and of the grant of such other tracts of land in the same area as may hereafter be acquired by the University, either with or without the reservation of life estates or of life leases to the grantors conveying same, and the further agreement of the Academy to actively endeavor to secure the gifts to the University of other lands in the area, and of funds by way of endowment, or otherwise, for the support and maintenance of the forest project hereinafter referred to, which is to be known and described as Cedar Creek Forest, the University agrees:

1. To keep and preserve in its natural condition the area now conveyed, and such additional lands in the same area that may hereafter be acquired by the University as a part of the general plan proposed, the same as far as possible to be maintained as a refuge for the wild life, both plant and animal, of the species now occurring there.

2. To administer the area so as to encourage its wise use for scientific and educational purposes, particularly for natural history studies.

3. To permit the Academy to co-operate in fostering and carrying out natural history studies, including the type of studies described in the article on "The Fate of the Indigenous," published in the Proceedings of the Minnesota Academy of Science, volume 5, page 15 to 23, inclusive.

4. Under reasonable rules and regulations to keep the area accessible for use by qualified and suitable persons, and to permit such persons to enter upon and make use of the natural resources for study and observation, it being understood such access and use shall not be limited to persons having an official connection with the University of Minnesota.
IT IS MUTUALLY UNDERSTOOD that reasonable regulations and restrictions may be made, both to protect the life estate reservations or leases held by the donors of certain parcels of land within the area, and also to prevent the impairment of the natural history values, and to increase the usefulness and value of the area for natural history studies.

IT IS FURTHER UNDERSTOOD that by the acceptance of the grant of the lands referred to, including future gifts or grants, the University does not obligate itself to incur expenditures out of its general funds to develop, administer, or maintain the forest; it being the hope and expectation that species gifts may be obtained for such purpose.

The University further agrees it will set up a committee, which, so far as possible, shall be representative of the various fields of natural history, which committee under the general direction of the President and Board of Regents of the University shall have the care and supervision of the Forest and its uses.

IN TESTIMONY WHEREOF, the said parties have caused these presents to be executed in their respective names by their respective presidents and secretaries, and their respective corporate seals to be hereunto affixed the day and year first above written.

In Presence of

MINNESOTA ACADEMY OF SCIENCE, INCORPORATED.

By____________________________________

Its President.

By____________________________________

Its Secretary.

THE REGENTS OF THE UNIVERSITY OF MINNESOTA.

By____________________________________

Its President.

By____________________________________

its Secretary.
STATE OF MINNESOTA SS.
COUNTY OF HENNEPIN

On this 11 day of December, 1942, before me, a notary public, within and for said county, personally appeared R. B. Harvey and John W. Moore to me personally known, who, being each by me duly sworn, each did say that they are respectively the president and the secretary of the Minnesota Academy of Science, Incorporated, one of the corporations named in the foregoing instrument, and that the seal affixed to said instrument is the corporate seal of said corporation, and that said instrument was signed and sealed in behalf of said corporation by authority of its Board of Directors, and said R. B. Harvey and John W. Moore acknowledged said instrument to be the free act and deed of said corporation.

Notary Public, Hennepin County, Minnesota.

STATE OF MINNESOTA SS.
COUNTY OF HENNEPIN

On this 11th day of December, 1942, before me, a notary public, within and for said county, personally appeared W. C. Coffey and W. T. Middlebrook to me personally known, who, being each by me duly sworn, each did say that they are respectively the president and the secretary of the Regents of the University of Minnesota, one of the corporations named in the foregoing instrument, and that the seal affixed to said instrument is the corporate seal of said corporation, and that said instrument was signed and sealed in behalf of said corporation by authority of its Board of Directors, and said W. C. Coffey and W. T. Middlebrook acknowledged said instrument to be the free act and deed of said corporation.

Notary Public, Hennepin County, Minnesota
My dear President Ford:

Professor O. T. Walter of Macalester College, who is president of the Minnesota Academy of Science, and I would like to discuss with you the question of the desirability of University ownership of a tract of land which we believe should be preserved for scientific and education purposes, assuming that the University would be presented with the tract.

One of the principal activities of the Academy of Science is the development of a better understanding of the natural history of Minnesota. An important part of this program is the encouragement of research on the natural communities of plants and animals. The Committee on the Preservation of Natural Conditions has been surveying the state to find relict tracts of the forest, prairie and other types which are sufficiently well preserved, and otherwise suitable, to serve as outdoor laboratories in which to study these natural communities. A few such tracts, but surprisingly good ones, have been located. Inasmuch as most of these tracts are threatened with destruction as far as their natural history values are concerned, we are endeavoring to find some means of preserving several of them in such a way that they may be available and remain suitable for scientific and educational purposes for many years to come.

One of these tracts is located at Cedar Creek, north of the Twin Cities, less than an hour's drive from the University. This tract contains what we believe is the southernmost outpost of the Canadian type of forest. On the low ground there are dense stands of white cedar, of black spruce, and of tamarack; on the higher ground there are white, red, and jack pines, and juniper, in addition to a great variety of deciduous trees and shrubs. There is an abundance of wild life, including deer, beavers, and grouse and other birds that are characteristic of the northern forest. This is consequently a local example of a type that is characteristically found from Brainerd northward. Although the tract is not entirely undisturbed, it is considered to be very valuable for research and educational purposes, and particularly so because of its proximity to the Twin Cities.

A natural preserve of from several hundred up to about 1600 acres would be possible, with a preference for at least 800 acres.

We should like to discuss with you informally some of the questions that would probably arise should the Academy propose to obtain funds from private sources for the purchase of these lands for presentation to the University with the understanding that they be preserved as nearly as possible in the undisturbed natural condition and be kept available for scientific and educational purposes.

I am enclosing three reprints which contain additional information on the Academy's work along this line.

Very truly yours,

A. N. WILCOX
Chairman, Committee on the Preservation of Natural Conditions

A. N. Wilcox:es
MINNESOTA ACADEMY OF SCIENCE

President Guy Stanton Ford
University of Minnesota
Minneapolis, Minnesota

University Farm
St. Paul Minnesota
April 9, 1940

Dear President Ford

In response to your request, I wish to offer additional information regarding the possible ownership by the University of the Cedar Creek Forest, as outlined in my letter of March twenty-fifth.

The Academy of Science is principally interested in seeing this forest preserved as nearly as possible in the undisturbed condition so that its original natural history values will be maintained, and to have it accessible to qualified workers for research and educational uses, subject to such restrictions as may be necessary to prevent the impairment of these natural history values. It is supposed that these uses would be in the nature of observation rather than experimentation. We are proposing ownership by the University in order to obtain a permanence of preservation and of wise administration of the forest for these purposes. We anticipate that the financial obligation of the University would be very limited.

If the presence of the forest became much better known to the public, a custodian would probably be needed to watch for forest fires, to prevent poaching, and to keep the forest from becoming a recreational area. At present the danger of forest fires is the most serious, but this danger is mitigated by several factors: The proposed area has easily observed natural boundaries, principally along roads or fields; it is included in the region to which fire protection is extended by the State Forestry Department; and it is surrounded by farmsteads whose owners are interested in fire prevention. Hunting has been outlawed by the establishment of a game refuge. Within the proposed area there are two or three tracts of forty acres each which will probably be reserved for lifetime use by the present owners, who are entirely sympathetic with these plans and are willing to contribute their holdings. The presence of these persons within the forest during the summer and the presence of interested farmers living around the borders of the forest should therefore make the employment of a custodian unnecessary for some years to come.

Extensive operations for so-called improvement would not be in keeping with the purposes for which this forest is desired. This should not be so construed, however, as to prevent the careful restoration of the small tracts which have been cleared, if such restoration should be considered wise and feasible. It is possible that it might become necessary eventually to fence the forest, but for the present the use of game refuge signs already in place along the boundaries, and the posting of suitable notices at the entrances to the forest should be sufficient.

A tract of about twenty acres of cultivated land lying just within the boundaries of the proposed area might be suitable for experimental work by various departments of the University, or for planting and propagation work, and there could be no serious objection to such use. A shelter for workers visiting the forest and a place for the storage of maps or instruments would be provided by a small dwelling house now located on one of the tracts, and such facilities would be extended later by the acquisition of buildings on the two or three parcels which for the present are to be used by their owners.

It should be pointed out that the purchase of this forest is to be made through philanthropies which the Academy is gradually but effectively mobilizing. It is en-
tirely possible that support of this kind may continue to be of assistance in con-
tributing to the costs of the items which I have enumerated as being most likely to
arise. The interest of the Academy will not cease with the presentation of the forest
to the University but rather can be expected to contribute to the effective use of this
natural history refuge.

The ownership of this forest would greatly increase the University’s facilities
for teaching and research in the various fields of natural history, and its preserva-
tion and use for scientific and educational purposes would constitute a public ser-
vice with a value which would increase greatly with the passing of years.

I shall be glad to answer any additional questions which may arise. We hope
that the regents can assure us that if and when this project is carried out, they will
be able to accept the gift for the designated purposes.

Very truly yours,

A. N. WILCOX (signed)
Chairman, Committee on the Preservation of
Natural Conditions

A. N. Wilcox: pj
UNIVERSITY OF MINNESOTA
Minneapolis
April 12, 1940

Office of the President

Mr. O. T. Walter
President, Minnesota Academy of Science
Macalester College
St. Paul, Minnesota

Mr. A. N. Wilcox
Chairman, Committee on Preservation of
Natural Conditions
University Farm

Gentlemen:

The Regents of the University of Minnesota at the meeting on April 12, 1940, gave favorable consideration to the proposal of the Minnesota Academy of Science to acquire and present to the University a tract of virgin woods to be held as such for scientific and educational purposes.

On the basis of the plan outlined in your letters of March 25 and April 9, 1940, the Regents were of the opinion that it would be a privilege to cooperate. As the plans develop, we shall report them to the Board.

The Regents directed me to express their appreciation of this generous and foresighted proposal by the Minnesota Academy of Sciences. I should like to add my personal appreciation.

Sincerely,

Guy Stanton Ford
President
## APPENDIX II

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<tr>
<th>Tract</th>
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<td>T1912</td>
<td>12/23/42</td>
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<td>Minn. Academy of Science</td>
<td>E 1/2 of SE 1/4, NW 1/4 of SE 1/4, Sec. 21 N 1/2 of SW 1/4, Sec. 23</td>
<td>Gift</td>
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<tr>
<td>T1913</td>
<td>12/23/42</td>
<td>Cora Cornelia</td>
<td>(MAS)</td>
<td>SW 1/4 of SW 1/4, Sec. 22</td>
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<td>T1914</td>
<td>12/23/42</td>
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<td>T1915</td>
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<td>T1917</td>
<td>04/28/43</td>
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<td>SW 1/4 of NE 1/4 &amp; SE 1/4 of NE 1/4, Sec. 22 Lying west of County Road</td>
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<td>T1918</td>
<td>12/16/46</td>
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<td>(MAS)</td>
<td>SW 1/4 of SE 1/4, Sec. 21</td>
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<td>T1920</td>
<td>04/25/50</td>
<td>Donald Lawrence</td>
<td>(MAS)</td>
<td>E 1/2 of NE 1/4, NE 1/4 or SE 1/4 lying north of County Road, Sec. 28</td>
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<td>T1921</td>
<td>04/14/51</td>
<td>Cora Cornelia</td>
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<td>T1922.1</td>
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<td>T1922.2</td>
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<td>T1922.3</td>
<td>07/09/52</td>
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<td>N 1/2 of NE 1/4, Sec. 22 exc. part East of Hwy.</td>
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<td>T1923</td>
<td>10/07/54</td>
<td>State of Minn.</td>
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<td>NE 1/4 or NE 1/4, Sec. 33 $400</td>
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<td>T1925</td>
<td>06/21/55</td>
<td>Warren Varnum</td>
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<td>A. P. Rickmire</td>
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<td>T1927</td>
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<td>Melvin Johnson</td>
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<td>NE 1/4 of SW 1/4, Sec. 21 $931.91</td>
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<td>T1928</td>
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<td>Frank Blair</td>
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<td>T1929</td>
<td>07/20/55</td>
<td>Melvin Bemis</td>
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<td>T1930</td>
<td>07/26/55</td>
<td>A. W. Norman</td>
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<td>E 1/2 of SE 1/4 of NW 1/4 Sec 20, SW 1/4 of NW 1/4 &amp; NW 1/4 of SW 1/4, Sec. 21 $2,200</td>
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<td>T1931</td>
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<td>Andrew Pearson</td>
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<td>W 1/2 of NE 1/4, Sec. 27 $4,300</td>
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<td>T1932</td>
<td>09/21/55</td>
<td>Fay Nickerson</td>
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<td>SE 1/4, Sec. 22 $3,600</td>
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<td>T1933</td>
<td>09/08/55</td>
<td>Eugene Hoodie</td>
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<td>T1934</td>
<td>10/12/55</td>
<td>Paul Pinkston</td>
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<td>NE 1/4 of NW 1/4 &amp; NW 1/4 of NE 1/4, Sec. 16 $4,300</td>
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<td>T1935</td>
<td>10/21/55</td>
<td>Edmund Heckenlaible</td>
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<td>NW 1/4 of NE 1/4, Sec. 33 &amp; lying east of Hwy &amp; NE 1/4 of NW 1/4, Sec. 33 $1,850</td>
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<td>T1936</td>
<td>10/28/55</td>
<td>John Howlett</td>
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<td>SE 1/4 of NE 1/4, Sec. 33 $750</td>
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<td>T1938</td>
<td>11/07/55</td>
<td>Wesley Henderson</td>
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<td>S 1/2 of SW 1/4, Sec. 16 &amp; N 1/2 of NW 1/4, Sec. 21 $3,600</td>
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<td>T1939</td>
<td>11/09/55</td>
<td>Joseph Lillion</td>
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<td>W 1/2 of SE 1/4 of NW 1/4 $3,800</td>
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<td>T1940</td>
<td>11/17/55</td>
<td>Esther Erickson &amp; Fred Johnson</td>
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<td>T1941</td>
<td>12/10/55</td>
<td>Mahlon Osborn</td>
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<td>SE 1/4 of SE 1/4, Sec. 16 $6,500</td>
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<td>T1942</td>
<td>12/20/55</td>
<td>John Mickelson</td>
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<tr>
<td>T1943</td>
<td>12/21/56</td>
<td>Fred Dutcher</td>
<td>NW ¼ of W ½ of SW ¼ Sec. 16</td>
<td>$ 500</td>
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<tr>
<td>T1944</td>
<td>12/21/55</td>
<td>Donald Eckert</td>
<td>NE ¼ of W ¼ of SW ¼, Sec. 34</td>
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<td>T1945</td>
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<td>Alfred Larson</td>
<td>SW ¼ of SW ¼, Sec. 35</td>
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<td>T1946</td>
<td>12/15/55</td>
<td>Charles Hughes</td>
<td>SE ½ of NE ½ of SW ¼, Sec. 33</td>
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<td>T1947</td>
<td>12/22/55</td>
<td>Joseph Swagger</td>
<td>W ½ of SW ¼, Sec. 34</td>
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<tr>
<td>T1948</td>
<td>12/21/55</td>
<td>Wilfred Bostrom</td>
<td>NE ¼ of NE ¼, NW ¼ and S ½ of SE ¼ of NW ¼, Sec. 22</td>
<td>$ 9,500</td>
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<tr>
<td>T1949</td>
<td>12/20/55</td>
<td>John Dewitt</td>
<td>W ½ of NE ¼, Sec. 28</td>
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<td>T1950</td>
<td>01/19/56</td>
<td>State of Minnesota</td>
<td>NW ¼ of SW ¼, Sec. 35</td>
<td>$ 850</td>
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<td>T1951</td>
<td>12/55</td>
<td>Oscar Engstrom</td>
<td>N ½ of SW ¼, Sec. 16</td>
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<tr>
<td>T1952</td>
<td>08/06/56</td>
<td>Edwin Osland</td>
<td>*NE ¼ of NW ¼, Sec. 26</td>
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<td>T1953</td>
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<td>Alvar Peterson</td>
<td>Parts of SE ½ of Sec. 27 &amp; SW ¼ of Sec. 26</td>
<td>$ 3,304</td>
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<td>T1954</td>
<td>10/04/57</td>
<td>Carrie Larson</td>
<td>E ½ of SW ¼ of Sec. ¼, Sec. 16</td>
<td>$ 500</td>
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<td>T1955</td>
<td>11/06/57</td>
<td>Prime Fleury</td>
<td>E ½ of SE ¼ of NW ¼ &amp; Govt. Lots 1-3, Sec. 35</td>
<td>$16,500</td>
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<td>T1956</td>
<td>01/09/58</td>
<td>State of Minnesota</td>
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<td>$ 900</td>
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<td>T1957</td>
<td>10/20/58</td>
<td>Melvin Lundgren</td>
<td>NE ¼ of NE ¼ &amp; S ½ of NE ¼ of NE ¼, Sec. 21 &amp; NW ¼ of NE ¼, Sec. 21</td>
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<td>T1958</td>
<td>11/07/61</td>
<td>Martha Crone</td>
<td>SW ¼ of NW ¼, Sec. 27</td>
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<td>T1959</td>
<td>12/18/63</td>
<td>John Mickelson</td>
<td>NE ¼ of NE ¼ &amp; SE ¼ of NE ¼, Sec. 27</td>
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<td>T1960</td>
<td>09/63</td>
<td>J. Anna Norris</td>
<td>NW ¼ of SW ¼, Sec. 27</td>
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<tr>
<td>T1961</td>
<td>03/03/64</td>
<td>Glenn Carpenter</td>
<td>SE ¼ of NE ¼ lying East of County Road</td>
<td>$ 915</td>
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*And Government Lots 1 & 2

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<td>T1967</td>
<td>05/06/64</td>
<td>Raphael Hamernick</td>
<td>N ¼ of SW ¼ of SE ½ &amp; SE ½ of SE ¼, Sec. 34</td>
<td>$ 8,000</td>
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<td>T1968</td>
<td>10/14/64</td>
<td>Edmund Heckenlaibe</td>
<td>W ½ of SW ¼ of NE ¼ &amp; part of E ½ of NW ¼, Sec. 33</td>
<td>$36,100</td>
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<td>T1969</td>
<td>02/28/66</td>
<td>Theodore Almquist</td>
<td>W ½ &amp; SE ½ of NW ¼ &amp; NE ¼ of SW ¼, Sec. 26</td>
<td>$15,300</td>
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<td>T1970</td>
<td>11/02/65</td>
<td>Wilfred Bostrom</td>
<td>NE ¼ of NE ¼, Sec. 22 lying East of County Road</td>
<td>Gift</td>
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<td>T1971</td>
<td>11/10/66</td>
<td>George Dhein</td>
<td>Government Lot 1, Sec. 36</td>
<td>$26,577</td>
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<td>T1972</td>
<td>07/10/67</td>
<td>Trena Barrett</td>
<td>Parts of S ½ of SW ¼ of SE ¼ of Sec. 34</td>
<td>$29,000</td>
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<td>T1976.1</td>
<td>09/18/67</td>
<td>Alvar Peterson, Herbert Peterson, Edmund Heckenlaibe</td>
<td>N 525 ft. Gvt. Lot 2, Sec. 25</td>
<td>$14,700</td>
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<td>T1976.2</td>
<td>09/18/67</td>
<td>Alvar Peterson, Herbert Peterson, Edmund Heckenlaibe</td>
<td>Lots 2-8 &amp; 9 Block 2, Lynn Terrace Village, East Bethel</td>
<td>$12,900</td>
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<td>T1976.3</td>
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<td>Alvar Peterson, Herbert Peterson, Edmund Heckenlaibe</td>
<td>Gvt. Lot 1, Sec. 25, Township 34</td>
<td>$29,000</td>
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<td>T1977</td>
<td>11/08/67</td>
<td>A. Penning</td>
<td>Lot 1, Block 2, Lynn Terrace Village, East Bethel</td>
<td>$2,400</td>
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<tr>
<td>T1979</td>
<td>05/06/68</td>
<td>Frederick Keslik</td>
<td>Lot 5, Block 2, Lynn Terrace, East Bethel</td>
<td>$13,875</td>
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<td>T1980</td>
<td>07/23/68</td>
<td>Adolph Adamack</td>
<td>Gvt. Lot 3, Sec. 25-34-23, lying SW Cty Rd 76</td>
<td>$950</td>
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<td>T1984</td>
<td>10/18/69</td>
<td>Alvar Peterson</td>
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<td>$40,200</td>
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<td>12/23/69</td>
<td>Harold Reynolds</td>
<td>E 1/2 of SW 1/4, Sec. 35</td>
<td>$15,700</td>
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<td>T1986</td>
<td>07/10/70</td>
<td>Donald Lawrence (Nature Conservancy)</td>
<td>SE 1/4 &amp; E 1/2 of SW 1/4 of SE 1/4, Sec. 28</td>
<td>$9,200</td>
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<tr>
<td>T1987</td>
<td>10/30/70</td>
<td>Clara Montzka</td>
<td>Part of SE 1/2 of NW 1/4, Sec. 33 lying East of County Road</td>
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<td>T1988</td>
<td>11/16/70</td>
<td>State of Minnesota</td>
<td>NE 1/4 of SE 1/4, Sec. 16</td>
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*16 acres of Government Lot 3 south of the new location of County Road 76.
APPENDIX II

May 10, 1983

Dear Professor Hodson:

You inquired about some of the parcels of land which were given to the University for development of the Cedar Creek Natural History Area. I have checked out the abstracts on the following tracts and find no evidence that Crone was involved with any of them, except the parcel she conveyed to the Regents.

T 1912 NW 1/4 of SE 1/4—Section 21
  Feb. 3, 1939   To Federal Land Bank via foreclosure
  Mar. 13, 1940   Bank conveyed to Cora Alta Corniea
  Dec. 23, 1942   Corniea conveyed to Minnesota Academy of Science
  Dec. 23, 1942   Academy conveyed to Regents

NE 1/4 of SW 1/4—Section 21
  Mar. 24, 1941   John Palmquist conveyed to Academy
  Dec. 23, 1942   Academy conveyed to Regents

NW 1/4 of SW 1/4—Section 22
  Dec. 22, 1941   Peter Beckstrom conveyed to Cora Alta Corniea
  Dec. 23, 1942   Corniea conveyed to Academy
  Dec. 23, 1942   Academy conveyed to Regents

E 1/2 of SE 1/4—Section 21
  Dec. 16, 1942   Eric Bostrom conveyed to Academy
  Dec. 23, 1942   Academy conveyed to Regents

T 1913 SW 1/4 of SW 1/4—Section 22
  Mar. 25, 1937   Lois Peterson Estate conveyed to Cora Alta Corniea
  Dec. 23, 1942   Corniea conveyed to Regents

T 1914 NW 1/4 of NW 1/4—Section 27
  Jan. 23, 1937   Sold to Corniea at private sale by order of Probate Court
  Dec. 23, 1942   Corniea conveyed to Regents

T 1915 SE 1/4 of NW 1/4—Section 27
  Dec. 21, 1940   Mary Swanson conveyed to Academy
  Dec. 23, 1942   Academy conveyed to Regents

T 1916 SE 1/4 of SW 1/4—Section 22
  Dec. 28, 1942   Lois Wiclund conveyed to Cora Alta Corniea
  Dec. 28, 1942   Corniea conveyed to Academy
  Apr. 29, 1943   Academy conveyed to Regents

T 1917 SW 1/4 of NE 1/2 and part of SE 1/4 of NE 1/4—Section 22
  Apr. 28, 1943   Glenn Carpenter conveyed to Regents

T 1918 SW 1/4 of SE 1/4—Section 21
  ?   Ludwig Olson conveyed to Cora Alta Corniea
  Dec. 16, 1946   Corniea conveyed to Regents
T 1919 (Property on north shore of Lake Superior)

T 1920 SE 1/4 of SE 1/4—Section 28
Apr. 13, 1950 Donald Lawrence conveyed to Academy
Apr. 25, 1950 Academy conveyed to Regents

T 1921 SE 1/4 of NW 1/4—Section 21
June 2, 1950 Alfred Nickelson conveyed to Cora Alta Corniea
Apr. 13, 1951 Corniea conveyed to Academy
Apr. 14, 1951 Academy conveyed to Regents

T 1922-1 NE 1/4 of NW 1/4—Section 27
Dec. 30, 1948 F. Gerald Nickerson conveyed to Cora Alta Corniea
Dec. 22, 1952 Corniea conveyed to Regents

T 1922-2 SW 1/4 of NE 1/4 and part of SE 1/4 of NE 1/4—Section 22
Apr. 28, 1943 Glenn Carpenter conveyed to Regents

T 1922-3 SW 1/4 of NW 1/4—Section 22
Dec. 6, 1945 Erick Bostrum conveyed to Cora Alta Corniea
Dec. 22, 1952 Corniea conveyed to Regents

T 1961 SW 1/4 of NW 1/4—Section 27
Apr. 1, 1937 Peter Mickelson gave Martha Crone a contract for deed
July 7, 1939 Mickelson conveyed to Martha Crone
Nov. 7, 1961 Crone conveyed to Regents

You will note that Mrs. Corniea had already acquired T 1913 and T 1914 before Mrs. Crone executed her contract for deed to the above property, which she later conveyed to the University.

Please let me know if you need further information for the history you are writing of the Cedar Creek Natural History Area.

Sincerely,

VERNON L. AUSEN
APPENDIX III

An Application to
THE TRUSTEES OF THE
MAX C. FLEISCHMANN FOUNDATION
OF NEVADA

For a Grant, through the Greater University Fund, to
the Regents of the University of Minnesota for

CEDAR CREEK FOREST

an Undertaking in Research and Education in
Natural History
by the University of Minnesota and the
Minnesota Academy of Science
April 1954

CEDAR CREEK FOREST

The purpose of this application is to show how an exceptional opportunity for research and education in natural history is being developed at Cedar Creek Forest by the University of Minnesota and the Minnesota Academy of Science, and to request funds for completing the project and maintaining it on a permanent basis.

Cedar Creek Forest is an area dedicated to scientific discovery and the education of scientists in the field of natural history. The area is unusual in that it contains several forests of distinct types, as well as meadows and grasslands, all in a remarkably wild condition. Yet it is located only thirty miles from the University of Minnesota and other colleges in the Twin Cities and is conveniently accessible throughout the year. Its rare combination of types of vegetation, its wildness, and its accessibility give it unique value as an outdoor laboratory for research in natural history. Its permanent dedication to these purposes makes long-range planning possible. The program envisioned for the use of the area has two principal aims; to encourage research leading to a better understanding of the broad, fundamental laws of natural history and to increase the competence of natural scientists by enlarging their appreciation of the living, organic world.

In what is normally the deciduous-forest belt of Minnesota, the Cedar Creek Forest area includes the southernmost outpost of the Canadian type of forest, with dense stands of white pine, old jack pines, and a grove of tall red pines on the uplands, and tamarack, white cedar, and black spruce in the swamps. There are tracts of hardwood forest, open meadows, and clearings now grown to prairie vegetation. The area contains two small lakes and is traversed by a large creek. Mammals and birds of the coniferous and deciduous forests meet here, deer are abundant, beavers are working along the creek, and the ruffed grouse and Canada spruce grouse are common. Rare species of plant and animal life are also found here.
HISTORY

When the settlement of Minnesota began, this state was the meeting place of three great formations of plant life: the northern coniferous forest, the deciduous forest, and the prairie. The coniferous forest was established over most of northern Minnesota except the western edge. The prairie was confined to the very western edge in the north but spread nearly across the state in the south. The deciduous, or hardwood, forest entered the state in the southeast, extended upward along the Mississippi River, widened to form the Big Woods south and west of Minneapolis, and then continued northwest into Canada in a narrowing band that separated the coniferous forest from the prairie. Minnesota was unique in affording extensive examples of all three types of vegetation.

The edges of these formations were usually distinct but irregular, with tongues and outposts of one extending into another. Such an outpost of the coniferous forest, separated from the main body to the north, was found within thirty miles of Minneapolis and St. Paul, along Cedar Creek, a tributary of the Rum River of logging fame. The stands of pine are considered by botanists to be unequaled except by those many miles farther north.

Here, indeed, is a relic of an older Minnesota that looks very much as it did when the early settlers saw it. How this forest close to a metropolitan center has remained so natural and wild is not fully understood. Although there are fire scars on some of the older trees, the presence of ancient prostrate junipers testifies that much of the area has long been fire-free. The swamps which surround the central hills no doubt afforded some protection from both fire and man. The topography also made the forest inconspicuous. When the botanists C. O. Rosendahl and F. K. Butters discovered a rare colony of the Decodon losse-stripe along the shore of the lake, they were unaware of the full extent of the evergreen forest. The ecologist W. S. Cooper, flying over the area soon after, was astonished at the density of this forest.

In 1939 the Minnesota Academy of Science recognized the importance of preserving this forest and dedicating it to scientific purposes. The best way to achieve this end, the Academy decided, was to make the University of Minnesota the custodian of the forest, for the Academy itself had no authority to hold property free from taxation. An agreement was accordingly negotiated with the Regents of the University, whereby the latter undertook to keep and preserve the area for the plant and animal life occurring there and as an outdoor laboratory for the use of qualified workers whether or not they might be connected with the University.

The Academy then procured donations of land and of funds for the purchase of land, transferring title as rapidly as possible to the University. The Academy was a struggling organization of 600 scientists and teachers from all parts of the state, endeavoring to move ahead on several fronts. Its own income, which amounted to only $1200 per year from dues, could not be diverted for buying land. Contributions for this special purpose were obtained first from individual members of the Academy, most of whom were connected with the University or some other college. Even the legal services for the purchase and transfer of lands were donated so that contributions could be used entirely for their intended purposes. A fundraising campaign with any publicity was out of the question because public attention would increase the price of the land and might jeopardize the project in other ways. Direct appeals to holders of larger fortunes in the state were very helpful,
but the returns were far short of needs. Most of the large educational foundations were dedicated to other purposes.

In spite of these difficulties a total of 780 acres has now been acquired, of which the University itself purchased 130 acres with special funds. Thus the project has been successfully established and appreciable progress has been made in acquiring the lands.

ADMINISTRATION AND USE

Cedar Creek Forest is owned by and is administered under the general direction of the Regents of the University of Minnesota, a constitutional corporation with administrative autonomy. Immediate direction is exercised by the Graduate School through a committee representing various fields of natural science. This committee consists of a chairman and three other members appointed from the faculty by the President of the University, and three members selected by the Trustees of the Minnesota Academy of Science from outside the University.

The committee, while striving to complete the acquisition of land, has endeavored in administering the forest to foster its natural values and to encourage its wise use. Because of the proximity of large cities, public access has had to be actively discouraged. The area is not needed for recreational purposes and such uses would damage its natural qualities. Collecting has been prohibited except when approved as a desirable part of a research study. The forest has been included in a state forest-fire control area and in a state game refuge.

The development of facilities for research was begun in 1947. Provision was made for the filing and preservation of records and maps. A special aerial survey provided photographs with which not only the physical features can be studied stereoscopically, but even certain species of trees can be identified. A mosaic map was constructed and from that was prepared a working map which is reproduced by printing. A temporary headquarters cabin was also provided and furnished for the overnight housing of two workers at any season of the year and for the storage of equipment.

Because of the present limitations of land and facilities, the administrative committee has had to refrain from actively promoting the use of the area. Nevertheless, several notable studies have already been published. Research is also under way on the history of the vegetation, on the present plants, birds, deer, and small mammals of the area, on the seasonal development of plant life in certain portions, on temperature conditions in the surface soil and lower air layers of marsh, swamp, and upland, and on mechanical analysis and hydrocarbon content of the peat deposits. The research work to date has been conducted principally by staff members and graduate students from the University. Regular visits for instructional purposes are also made by small classes, both graduate and undergraduate, from a number of departments of the University and from other colleges within a radius of 100 miles. The Audubon Society makes an annual bird census in a portion of the forest.

Thus a beginning has been made toward carrying out the functions of the area as a laboratory and a natural history preserve, and a foundation is being laid for the broader program to be developed when the land and facilities are adequate.
FUTURE WORK

In addition to providing a convenient outdoor laboratory for a wide variety of natural history studies, the permanent dedication of the Cedar Creek Forest to these purposes makes possible a type of biological research that is now little developed. Nature is dynamic. Its plants and animals are living, varying organisms, often fluctuating in waves and moving on major currents of change in both space and time. The time element has been the most difficult to investigate thoroughly, for the want of permanently dedicated outdoor laboratories. Such laboratories must also be biologically suitable and must be accessible enough to allow extensive work at any season. The Cedar Creek Forest, when completed in land and facilities, would meet these conditions.

 Adequate mapping is an essential part of this program. Arrangements have been made for a new aerial survey of the area and of the surrounding region. Among the first tasks to be performed after the land has been acquired will be the preparation of topographic and soil maps. Complete biological surveys are then proposed for selected areas within the refuge, to be carried out gradually as qualified workers become available for one or another component study. Such maps and notes on plant and animal distribution, supplemented by periodic aerial surveys, would make possible the study of distribution changes and of the interactions of various organisms in time as well as in space. Each component study would be a separate contribution, and would also complement every other study as an integrated part of a broad and comprehensive program. No regimentation of any worker is intended, but rather the establishment of the facilities that will encourage productive cooperation. These facilities will be available to personnel from all colleges and institutions, and even to independent but qualified workers, on the same basis.

The long-range planning for the management and use of the reservation will be based upon careful study by competent authorities. Two major programs will be designed: (a) one for the use of the land, concerned with the designation of the areas that are to be kept undisturbed, those that are to be reforested and managed as forest areas, and those that are to serve as insulation or protection; (b) one for education and research, including the integration of research so that the findings of one period can be quickly related to those made ten years or one hundred years later.

NEEDS

To complete the purchase of the land, to establish adequate but modest facilities, and to provide an income for maintenance will require nearly $500,000.

The most urgent requirement is for the purchase of land. Approximately 5,000 acres are needed to consolidate the holdings, to provide boundaries easily defined by highways and power lines, to include additional types of vegetation, and to extend the range for the wild life. The proximity of the Twin Cities makes it imperative that the natural areas be protected from trespass and insulated from fire. A considerable portion of the desired acreage is needed to enrich the collection of vegetation types and to include the shore of a mile-long lake which is extremely interesting biologically and known to be one boundary of the habitat of deer that travel back and forth from the evergreen forest within the present holdings. The
acreage contains, to the south, a scrub-oak type that is representative of a strip extending half way across the state.

The desired land now has nearly fifty owners, whose individual holdings range from 20 to 227 acres. Fortunately for the cost of the project, much of this land is submarginal for agriculture. Recent sales of non-timber land have been mainly to urban workers who wish to live here—a development which underlines the urgency of buying the land while the wild portions are still intact. The cost is estimated at $165,000. This estimate is based on the assumption that the purchases would be gradual, extending over a number of years.

The second requirement is for support and maintenance. A resident curator or custodian is needed on the ground itself to supervise the forest and its facilities, to prevent undesirable trespass, to maintain boundaries, fences, and fire trails, and to foster good public relations. The cost of support and maintenance, including his salary is estimated at $7,500 to $10,000 per year, depending upon the size of the project at the time. An endowment of $250,000 is requested to provide income for carrying the major portion of this essential cost. It should be pointed out that, although the University of Minnesota has an enviable record in the support of fundamental research, it depends upon legislative appropriations for a major portion of its operating costs. Cedar Creek Forest, if the permanence which is one of its essential properties is to be ensured, needs an independent source of income for its maintenance. The University will still carry important responsibilities for its scientific and educational operations and for its administration.

The third need is for a headquarters building with facilities for supervision, laboratory work, and housing throughout the year. The curator should live at a central control point. The needed facilities include a small but modern laboratory, a meeting room, conveniences for men and women, and overnight accommodations for individuals or small classes. Since persons using the area travel from 30 to 100 miles to do so, overnight stays add considerably to the time available for work. Shelter is particularly important in winter. Suitable laboratory equipment is needed for any work that must be done locally. It is estimated that, with good planning, an adequate and attractive building could be provided for $75,000.

These three major needs—land, endowment, and buildings—would require $480,000. This does not include the University's contribution of scientific talent nor the general administrative costs that are inevitable in developing and carrying out such a project. Furthermore, it is the intention and hope of the University to obtain additional funds for the support of the surveys and research work that are to be undertaken.

It is significant that when the Greater University Fund was established and the first call was issued for projects deserving its attention, nine departments of the University joined in requesting the completion of Cedar Creek Forest. No other project that has come before the Fund has ever had such broad support; regretfully the amount needed was too great to be provided by any available resources. The request nevertheless demonstrates how important this project, which was initiated by the Academy of Science, had already become to the University itself.

The rare combination of qualities possessed by Cedar Creek Forest—its variety of natural environments and types of vegetation, its wildness, and its year-round accessibility to large numbers of scientists and students—gives it unique value as an outdoor laboratory. The willingness of the University of Minnesota to accept the responsibility of administering the forest and developing its resources for re-
search provides the assurance of its dedication to scientific and educational pur-
poses. The interest and participation of the Minnesota Academy of Science and the
faculties of the University and other colleges indicate that the uses of the forest will
increase as its facilities are developed. These are the grounds for our faith that the
grant requested of the Max C. Fleischmann Foundation would be a good invest-
ment, yielding dividends in a better understanding of nature and in the education
of more competent scientists.

The photographs, which are intended to aid in the documentation of this applica-
tion, were all taken in the Cedar Creek Forest area in 1953. The heaviest stands of
timber could not be satisfactorily photographed, because of their density.

CEDAR CREEK FOREST COMMITTEE

Ernst C. Abbe, Ph.D., Professor of Botany
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Dwight E. Minnich, Ph.D., Professor and Chairman, Dept. of Zoology
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Theodore C. Blegen, Ph.D., Litt.D.,
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ARTHUR N. WILCOX, Ph.D., Associate Professor of Horticulture, University of Minnesota, Institute of Agriculture, chairman of the committee

United States Forest Service
APPENDIX IV

THE CEDAR CREEK FOREST LABORATORY
(An Address Delivered on September 14, 1957, at Cedar Creek Forest)

By
Theodore C. Blegen
Dean of the Graduate School, University of Minnesota

"Did you ever see a dream walking?" This musical question, from a popular song of some years age, seems to me to offer a theme for our dedication of the Cedar Creek Forest Laboratory.

Today not one, but many, dreams are on their feet. They are walking—and they are walking vigorously. A day of dedication inevitably is a day for remembering and a day for looking ahead, and so today I should like to recall persons and institutions that dreamed the dreams which are walking on this day. Who first realized what science might do with this area?

This is a piece of earth that civilization passed by, flowed around, mainly ignored. I never visit these wild acres without thinking that even today they are much as they must have been in 1680, when Father Hennepin, one of our early explorers, looked at the Minnesota scene—before farms and cities and development had changed the primeval character of that scene.

Father Hennepin may not have tramped through Cedar Creek Forests, though he must have passed this general way 277 years ago on his overland march to Lake Mille Lacs. But a modern botanical explorer, Dr. William S. Cooper, saw the area, saw it from the air, discerned its potentialities, and in the 1930's recommended its preservation and use to a committee of the Minnesota Academy of Science—the Committee for the Preservation of Natural Conditions. Today I pay honor to D. Cooper as one whose dreams have been realized. He understood the research resources of his bog—this preserved bit of primitive Minnesota—for his colleagues and himself, for graduate students, for scientific studies through a long period of time. And alongside Dr. Cooper let us also remember two other botanists, Professors Rosendahl and Butters, who were pioneers and explorers in this area with Dr. Cooper.

An organization can envision and plan creatively for the future, too, and I pay honor today to the Minnesota Academy of Science, which, in 1938 and 1939, on the basis of committee studies, took constructive action looking toward the preservation of this area as an outdoor laboratory for the biological sciences. The Academy has been constant in its interest and both active and generous in its cooperation through the years since then. I am frank to say that I do not think we should be here today, watching a walking dream, if it had not been for the Academy’s initiative, its eagerness to acquire these lands as research lands for the future, its generous readiness to cooperate with the University of Minnesota in a plan for their administration and use. I thank the Academy and pay it honor for a fine thing finely done—and I ask the present President of the Academy, Dr. Harold Peters, Head of the Science Department in the Bemidji State College, to rise so that to him, and through him to the scholars and Academy he represents, we may express our grateful appreciation.

So through the years, with the start of ideas and imagination, we have pushed ahead, slowly but steadily. Many mature scholars, many students in graduate
training, have searched out in this area materials for their studies, and the bibliography of their contributions to knowledge, based upon researches carried on there, is already long and impressive.

We know why the area affords such a rich promise for field studies. Dr. Arthur N. Wilcox, the devoted Director of the project, tells us that this Forest is "a southern relict outpost of the Canadian type of forest and the only example of the forest located so close to Minneapolis and St. Paul and to the colleges and universities in that region." Dr. Wilcox goes on to say, in a report to the Minnesota Academy of Science, "Here on the hills and slopes are found all three kinds of pine that are native to Minnesota as well as old prostrate junipers and many species of hardwood trees. Tamarack, white cedar, and black spruce occur in dense stands. Birds and mammals of the northern forest inhabit the area. The ruffed grous and the Canada spruce grouse are found here, and this is the southernmost place in Minnesota where the Canada jay can be seen regularly. Even the rare arctic three-toed woodpecker has been watched here. Deer are numerous, and beavers have recently been active along the creek. The survival of this refuge may have been due in part to its separation from the main body of the forest and in part to its isolation by swamp land from encroachment and fire." And I think Dr. Wilcox would be the first to admit that these are only a few of the many items that attract scholars to this region—the land, the insects, the trees and shrubs, the waters, the animal and plant and bird life, the wide-sweeping range of north-south nature in an undisturbed natural laboratory. Cedar Creek is not a park. It is not a picnic grounds. It is not a tourist center. It is not a recreation spot for those of us who have tired nerves. It is an outdoor laboratory, a place for study, a natural terrain for biological scholars.

So the University and the faculty of its school for the education of scholars and scientists at the highest level—the Graduate School—took a warm and enthusiastic interest in Cedar Creek, as did the scholars in the Academy and the colleges and schools throughout our state. The Graduate School gladly took over the administration of the Forest in 1945 at the request of President Coffey, with an advisory committee made up of experts both from the University staff and from the Academy. Step by step we have moved ahead, and dedicated individuals have aided us greatly in increasing our lands in the area, notably Dr. and Mrs. A. D. Cornelia; Mr. and Mrs. Glenn A. Carpenter; Miss Helen Bunn; Dr. and Mrs. Donald Lawrence; Mrs. Martha E. Crone; Dr. J. Anna Norris; and others. To them all we give thanks for their vision and generosity.

We faced compelling needs, as our vision was clarified, as to what we could do to make this Forest serve science to the full, as to adding more land to the area under our control for permanent conservation, and also as to creating a suitable central laboratory and headquarters building somewhere in the Forest, with as many and as good facilities as we could provide. In the realm both of policy and of action, I cannot too strongly commend the University and Academy committee, whose members have worked devotedly through the years to turn ideas into reality and have not only supported President Morrill, the Graduate School and myself in every possible action to advance the cause, but also—as is sometimes the way with faculty committees—encouraged us as administrators to run, as the Red Queen advised Alice in Wonderland, twice as fast as we thought we could.

In the end the enterprise has been forwarded by co-operation and interest from many sources, notably from Mrs. Sarah Fleischmann and the Max Fleischmann
Foundation. Their grant of a quarter of a million dollars made possible the well-designed building that we dedicate today and also an urgently needed enlargement of our landholdings in the Forest. I should like Mrs. Fleischmann and the trustees of the Foundation to know that what they so generously did will forward scientific research through a future that we cannot measure.

Much has already been done, we are still, I believe, in our earlier, our pioneer stages. I do not pretend to be a prophet, but it requires neither the vision nor the flowing beard of a prophet to foretell that out of this enterprise—and with the encouragement received from the Foundation and from many individuals and institutions—advances in the understanding of nature and of man's relation to nature will emerge which will promote science and interest in science and will bless those who helped when help was critically and urgently needed. What is now afoot will do honor to Max Fleischmann, conservationist and nature lover, through a future that will run, I hope hundreds of years, beyond the lives of all of us.

To the research of the future and its potentials for human knowledge, we look forward with high hope. Science, said Emerson, is the geography of our ignorance. I would add that the study of nature and life by scholars skilled in observation and analysis is the devoted servant of man in his endless quest to understand himself in the wonderful world that the ages have created—this world that thus far has somehow survived both our ignorance and our folly and survived, I think, because of human wisdom and courage nurtured by the very quest of man to enlarge his own knowledge and comprehension. Cedar Creek is a symbol of this unending quest.

If I have only inadequately touched on the interests and contributions of the many who have helped to build the Cedar Creek enterprise, happily I have in my hands a letter from President Morrill of the University of Minnesota which interprets the occasion in the name of the University and for all of us with a fundamental understanding of what it really means. The President wrote me before he left for Europe, and I quote this letter in full:

September 5, 1957

Dr. Dean Blegen:

I regret very much that it will not be possible for me to attend the dedication of the Cedar Creek Forest Laboratory. I will be in Belgium at the time, attending a conference on the North Atlantic Community, and would like to relay upon you to extend my greetings to our friends and associates assembled for the occasion.

Cedar Creek Forest, and the progress this new building and the new land acquisition represent have double significance in the ongoing of the University. All of this does represent marked advance in the University's outreach and in its commitment to scholarship, research and service. Of equal significance, however, is the vitality of the cooperation that has characterized this whole venture. The Minnesota Academy of Science, the colleges of Minnesota and the teachers of science throughout our state we do regard as our indispensable partners in this project. All of us share, too, the earnest hope that this new resource will not only expand facilities for teaching and study in the natural sciences in our state, but that it will help heighten the tempo of interest on the part of our young people in the natural and biological sciences.

All of us shared, too, I know, the earnest hope that it might be possible for Mrs. Sarah Fleischmann to see the fruits of the confidence the Max C. Fleischmann Foundation expressed in both the University and the Academy through its gener-
ous grant. We have realized here the hope and dreams of many Minnesota people who have labored in the interests of Cedar Creek Forest for almost a quarter of a century.

The Board of Regents and the Administration of the University are deeply grateful to the Trustees of the Fleischmann Foundation, to the members of the Minnesota Academy of Science, to the members of the University staff and others who have contributed toward the realization of this commitment to preserve a wilderness virtually in the midst of our urban civilization. For the generous interest and assistance of the many citizens and officials of Isanti and Anoka counties and the state we are grateful also. This dedication day is a grateful day in our lives and I only wish it might have been possible for me to be at Cedar Creek to share in it with you.

With every good wish,

Sincerely,

J. L. Morrill
President

Let this eloquent letter, let these sincerely voiced thoughts of the President of the University of Minnesota, dedicate the Cedar Creek Forest Laboratory for research and service to science, to scholarship, to mankind, in a future that is illimitable.
APPENDIX V

Cedar Creek Natural History Area Bibliography—Including Literature Cited and Research Carried on Away from CCNHA

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Distribution of Graduate Student Theses by Major Areas

Botany-11; Ecology and Behavioral Biology—23; Entomology, Fisheries, & Wildlife-12; Forestry-2; Geology-1; and Zoology-4.