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STATE LIBRARY OF IOWA  
DES MOINES, IOWA 50319



The Iowa City Area  
as a site for the proposed  
**NASA ELECTRONICS  
RESEARCH CENTER**

STATE LIBRARY OF IOWA  
**WITHDRAWN**  
DES MOINES, IOWA 50319

DECEMBER 11, 1963

**The Iowa City Area  
as a site for the proposed  
NASA ELECTRONICS  
RESEARCH CENTER**

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**Oral Presentation  
by Dr. J. A. VanAllen-- State University of Iowa  
Iowa City, Iowa  
to National Aeronautics and Space Administration  
Washington, D.C.**

**STATE LIBRARY OF IOWA  
DES MOINES, IOWA 50319**

*DECEMBER 11, 1963*

~~STATE LIBRARY~~  
STATE LIBRARY  
DES MOINES, IOWA



STATE OF IOWA  
OFFICE OF THE GOVERNOR  
DES MOINES

HAROLD E. HUGHES  
GOVERNOR

December 6, 1963

Mr. James E. Webb, Administrator  
National Aeronautics and Space Administration  
Washington, D. C.

Dear Mr. Webb:

It is a great privilege for me, as Governor of the State of Iowa, to join with leading scientists, educators, and research-oriented electronics industries in urging that Iowa's facilities and capabilities be given thorough consideration in determining a site for the proposed NASA Electronics Research Center.

Contributions by Iowa's two state universities and numerous private industries to the nation's research and space exploration efforts are already well-known. The work of Dr. James Van Allen of the State University of Iowa and Dr. Frank Spedding of the Atomic Energy Laboratory at Iowa State University in Ames, plus the activities of such firms as Collins Radio at Cedar Rapids, Pioneer Central Division of the Bendix Corporation at Davenport, and other electronics and instrument firms in Iowa, needs no introduction at NASA or other major federal agencies.

Iowa's location in the heart of the nation provides easy access to and quick communication with Midwest Research Institute at Kansas City, Armour Institute in Chicago, Strategic Air Command Headquarters in Omaha, McDonnell Aircraft in St. Louis, and the engineering schools and research facilities of universities in both the "Big 10" and "Big 8" groups. In addition, the area is centrally located with regard to research and production complexes on both the East and West Coasts.

Similarly, although Iowa is geographically linked to such major metropolitan centers as Chicago, Kansas City, St. Louis, Omaha and the Twin Cities area, the state has a great deal to offer in the way of uncrowded working conditions and sufficient land for such a Center without the burden of long commuting distances.

WITHDRAWN

3-29-68

gift

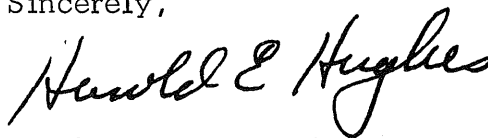
Mr. James E. Webb  
December 6, 1963  
Page 2

In addition, an Iowa location would provide the nation with greater security because it would alleviate the heavy concentration of research and industrial facilities which now exists in some of the major population areas of the country.

Professional and technically-trained personnel to man the Center can be provided in Iowa; a university-industrial research climate conducive to the work of the Center exists; and industries utilizing the technological and scientific facilities of such a Center already are operating in Iowa.

It is with these qualifications in mind that I sincerely urge that the State of Iowa be given primary consideration in your efforts to determine the most suitable site for the proposed Electronics Research Center.

Sincerely,



HAROLD E. HUGHES  
Governor of Iowa

HEH/ln

STATE  
UNIVERSITY OF IOWA  
IOWA CITY, IOWA



*Office of the President*

December 1963

Subject: Location of the Proposed NASA Electronics Research  
Center in the Iowa City Area

Dear Mr. Webb:

In substantiation of several points presented in summary form in my letter of November 29, the following pages will provide information which we believe you will find useful in a preliminary evaluation of our request that you consider the Iowa City area for the location of the NASA Electronics Research Center. I have asked Dr. Van Allen to leave copies of this document for you and the members of your Survey Committee when he presents our thinking orally to Dr. George L. Simpson on the 11th of December, and I trust that you and the Committee will call upon either or both of us to clarify or elaborate upon any statements made therein.

In this presentation we are calling attention particularly to an area which we have for convenience identified as the "Mid-America Region," that portion of the Midwest which is bounded by Chicago, St. Louis, Kansas City, and Minneapolis-St. Paul. Some 16 million persons live within this region; within it also may be found 14 outstanding state and private universities which contribute quite a remarkable share of this nation's total number of Ph. D. graduates in the physical sciences, engineering, and mathematics each year. I need hardly mention that our own State University of Iowa is numbered among these institutions, or that the University and Iowa City are in the heart of the Mid-America Region about which we are concerned.

Obligated as we are by the NASA-SUI agreement of August 1962 to seek means to feed space technology research results "into the industries and segments of the economy with which the University normally has close relations . . ." we can envision no better means of accomplishing these ends than through aiding and supporting the establishment of a major NASA Research Center nearby.

December 1963

However, our basic reason for urging consideration of the proposed location remains as I cited it in my earlier letter: our belief that such a location "would facilitate access to the immense industrial and educational resources of the middle-west and probably would yield a greater increase in national competence in space technology than that which would result from its location in any other region in the United States."

Sincerely yours,

A handwritten signature in cursive script that reads "Virgil M. Hancher".

Virgil M. Hancher  
President

Mr. James E. Webb



R. T. COX, Vice President

Cedar Rapids, Iowa

telephone : area code 319, 365-8411

cable : COLINRAD

December 6, 1963

Mr. James E. Webb, Administrator  
National Aeronautics and Space Administration  
Washington, D. C.

Dear Mr. Webb:

Both the State University of Iowa at Iowa City, Iowa and the Iowa State University at Ames, Iowa are making presentations to the NASA outlining the capabilities of their areas to provide an effective environment for the new NASA Electronics Research Center. First, we would like to heartily endorse the efforts of both areas and their desire to have the Center located nearby.

Since we are the largest employer in the State, and more particular, have an operation not unlike that of the NASA Research Center, you may find our comments on the desirability of locating such a Center in Iowa particularly pertinent.

Our total employment is approximately 9,500 people in Cedar Rapids, a city about 20 miles north of the State University of Iowa at Iowa City, and 100 miles east of Iowa State University at Ames, Iowa. As part of our operation in Cedar Rapids, we have a Research and Development Department with a total employment of some 2,200 people, a size you will note which is roughly comparable to the proposed Center. We employ approximately 1,400 college graduates of various degree levels, most of whom are engineers or scientists. The remainder of our operation is a large computing center and a factory complete with fabrication facilities.

We also operate similar, though smaller, establishments in Dallas, Texas and Newport Beach, California.

We have found our location to be eminently satisfactory for a technical operation. Personnel transportation, an important point, is well handled by the main east-west line of United Air Lines and north-south by Ozark.

We have always found readily available an ample supply of industrious workers. Their aptitude in mechanical and technical areas is a natural outgrowth of their predominantly rural background. Their training has been well handled by an active program in the secondary schools. Thus we have been able to supply our laboratory with suitable laboratory technicians, draftsmen, model shop mechanics and all the other necessary supporting services.

- 2 -

We have also found it to be an excellent place to attract engineers and scientists. The large state supported universities of the Midwest graduate annually a large number of engineers, many of whom are anxious to remain in the Midwest if they can find stimulating and challenging employment opportunities. We have had no trouble in making substantial increases to our technical staff which has increased over 200 in the last two years. We are somewhat limited in our abilities to make "over night" increases in employment since there are admittedly not a great number of firms such as ours in the area. We have, however, been able to handle any increase which has arisen, including the recent increases necessary to fulfill our part of the Apollo Program.

Our turnover rate in technical personnel is much lower than the national average.

If we can be of any further help to the NASA in answering questions about our experience in the State, we would be most happy to do so. We certainly feel that the State would be an excellent location for the NASA Center. In view of the dearth of such government facilities in the Midwest, we sincerely hope that the NASA will give serious consideration to the location in Iowa where an environment consisting of universities and technical industries exists and where there is ample supporting labor and services with mechanical and technical aptitudes.

Sincerely yours,

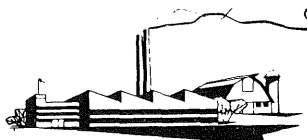


R. T. Cox  
Vice President  
Cedar Rapids Division

ef



GOVERNOR: HAROLD E. HUGHES



# IOWA DEVELOPMENT COMMISSION

200 JEWETT BUILDING • DES MOINES, IOWA 50309

Telephone AT 2-0231

CHAIRMAN: MARVIN M. SCHMIDT, DES MOINES  
VICE CHAIRMAN: PAUL FRANZENBURG, CONRAD  
RAYMOND EVELAND, KELLEY  
JAMES A. FLANAGAN, CEDAR RAPIDS  
ANDREW G. FROMMELT, DUBUQUE  
E. A. HAYES, MT. PLEASANT  
HANS MORGAN, CLARINDA  
JOHN J. MURRAY, FORT DODGE  
ARTHUR SANFORD, SIOUX CITY  
EDWARD A. WEARIN, RED OAK  
RICHARD O. WILSON, CLINTON  
DIRECTOR: C. E. WORLAN

December 7, 1963

Dear Mr. Webb:

At the risk of burdening the record concerning the site of the proposed Electronics Research Center to be constructed for the National Aeronautics and Space Administration, may I take this opportunity to add my voice to those requesting that strong consideration be given to the State of Iowa on this project.

As an industrialist and as chairman of the Iowa Development Commission, I would like to point out that Iowa has much to offer towards the further development of this country's research and space program. Many contributions in this direction have been made by our two state universities, one of which has the largest engineering college west of the Mississippi River. Graduates of these universities, as well as those of the 29 other institutions of higher learning in Iowa, have long been recognized as leaders in professional and technological fields.

Many industries in the state are research-oriented, particularly in the electronics and communications field. Among them are Minneapolis-Honeywell, Collins Radio, Bendix Corporation, Sylvania and General Electric, plus a number of other firms of similar nature including-- Advance Ross Electronics, International Resistance, and Wincharger.

Competent personnel, at the professional and technical level as well as at the skilled and semi-skilled scale, is available. Furthermore, our major universities are willing to, and do, conduct courses in advanced study, so that such personnel can keep abreast of the latest developments in their fields.

Iowa's basic labor force has inherent mechanical ability, gained from a broad background in agriculture, which permits its members to be trained readily and economically.

The state's network of transportation--on land and by air--gives rapid access to other centers of major importance in the NASA research program. Effective liaison is already in effect with many such centers.

Other governmental agencies, such as the Atomic Energy Commission and the United States Department of Agriculture, have previously recognized many of Iowa's advantages and have established major research laboratories in the state. While an Iowa location for

IOWA: WHERE FACTORY AND FARM SHARE PROSPERITY


- 2 - Mr. Webb

the proposed Center would have the advantages of a centralized site adjacent to major population, industrial and research areas, suitable living accommodations can be provided at several locations without imposing an undue commuting hardship on Center personnel. Furthermore, large-scale sites are available in areas where the desired university-industrial complexes exist.

Finally, in the position of chairman of the Iowa Development Commission, may I offer to you and to NASA the facilities of that organization, which stands willing to expend every effort to provide and further information on Iowa, its assets and its qualifications, that may be desired.

It is my earnest hope, along with the hopes of many others concerned with the future space and communications program of NASA, that every facet of Iowa's advantages as a site for the Center will be explored.

Sincerely,

  
Marvin M. Schmidt, Chairman  
IOWA DEVELOPMENT COMMISSION

MMS:s

Mr. James Webb, Administrator  
National Aeronautics and Space Administration  
Washington, D.C.

DEC. 11, 1963

NASA ELECTRONIC RESEARCH CENTER

THE PROPOSED

AS A SITE FOR

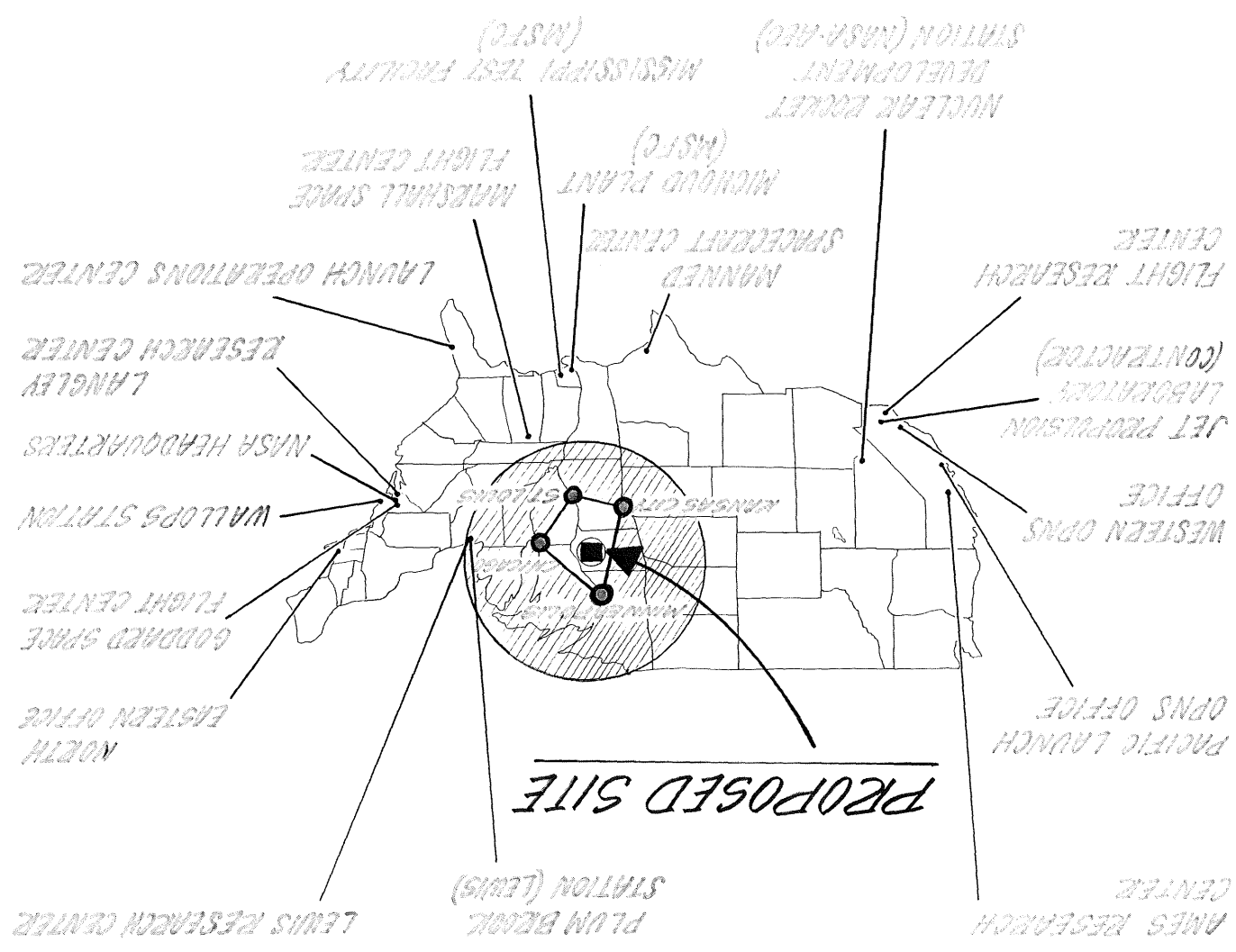
CONSIDERATION OF THE IOWA CITY AREA

FOR THE

ORAL PRESENTATION



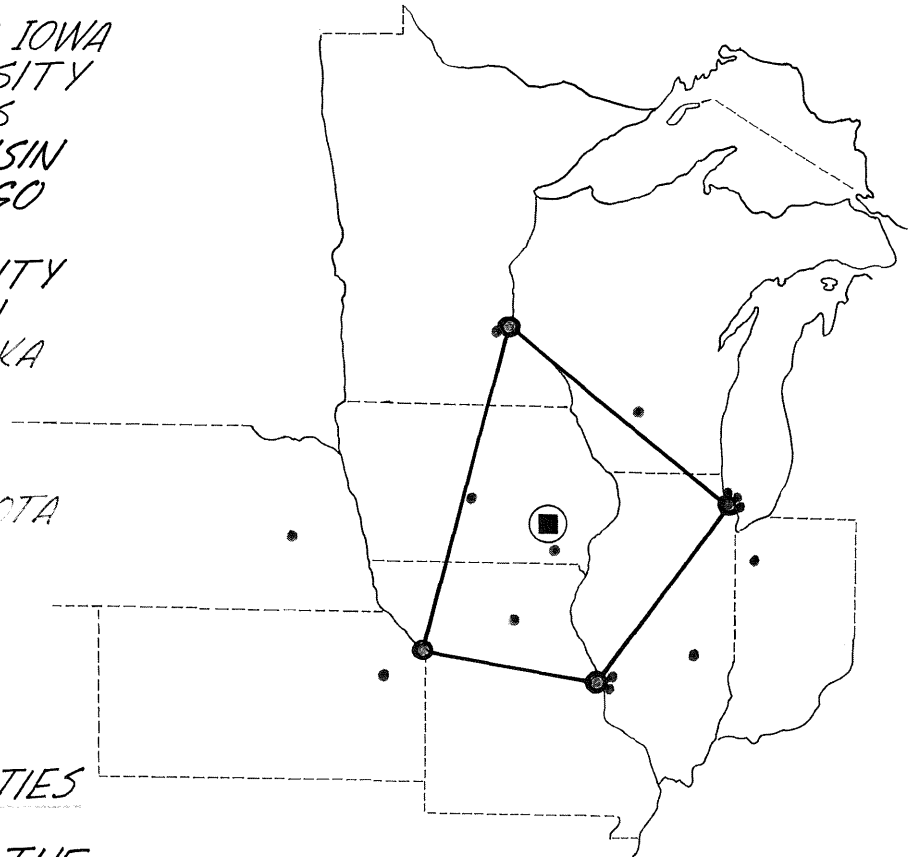
RELATIONSHIP OF PROPOSED SITE TO PRESENT  
NASA INSTALLATIONS AND INDUSTRIAL CENTERS  
IN THE MIDWEST



MAJOR CENTERS of GRADUATE WORK IN THE ENGINEERING  
& PHYSICAL SCIENCES IN THE MID-AMERICA REGION



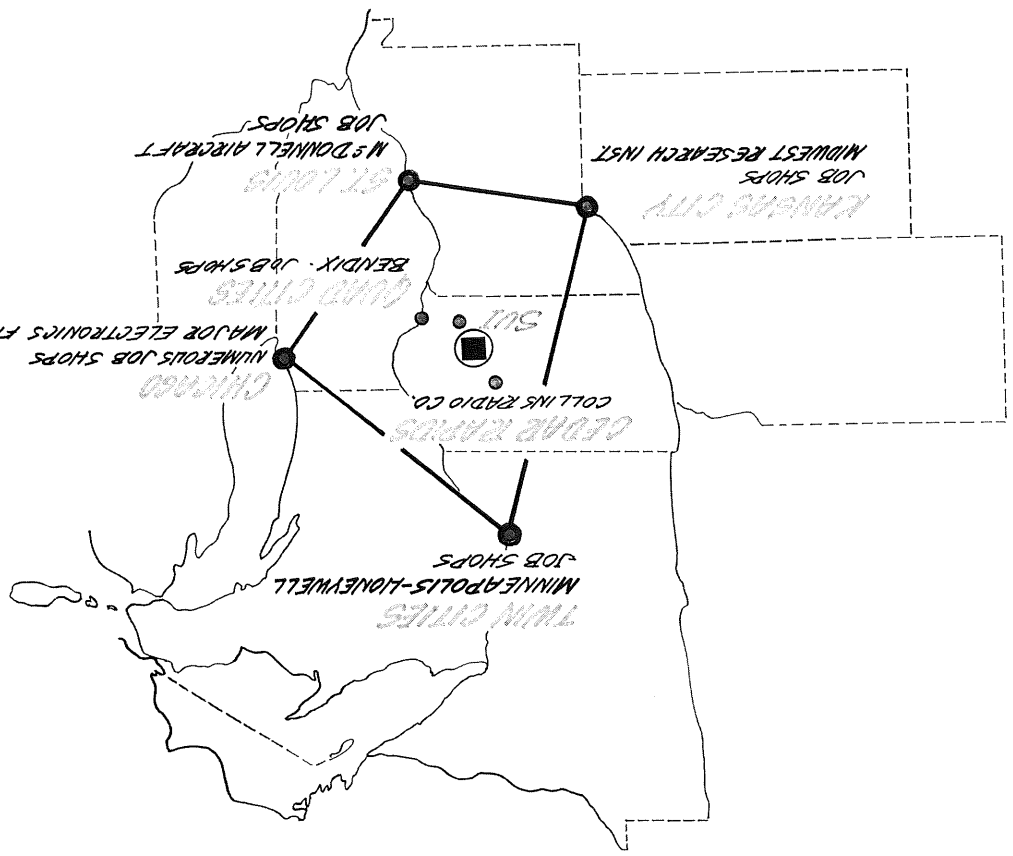
- STATE UNIVERSITY of IOWA
- IOWA STATE UNIVERSITY
- UNIVERSITY of ILLINOIS
- UNIVERSITY of WISCONSIN
- UNIVERSITY of CHICAGO
- St. LOUIS UNIVERSITY
- WASHINGTON UNIVERSITY
- UNIVERSITY of MISSOURI
- UNIVERSITY of NEBRASKA
- I. I. T.
- PURDUE
- NORTHWESTERN
- UNIVERSITY of MINNESOTA
- UNIVERSITY of KANSAS



6 OF BIG TEN UNIVERSITIES

4 OF BIG 8

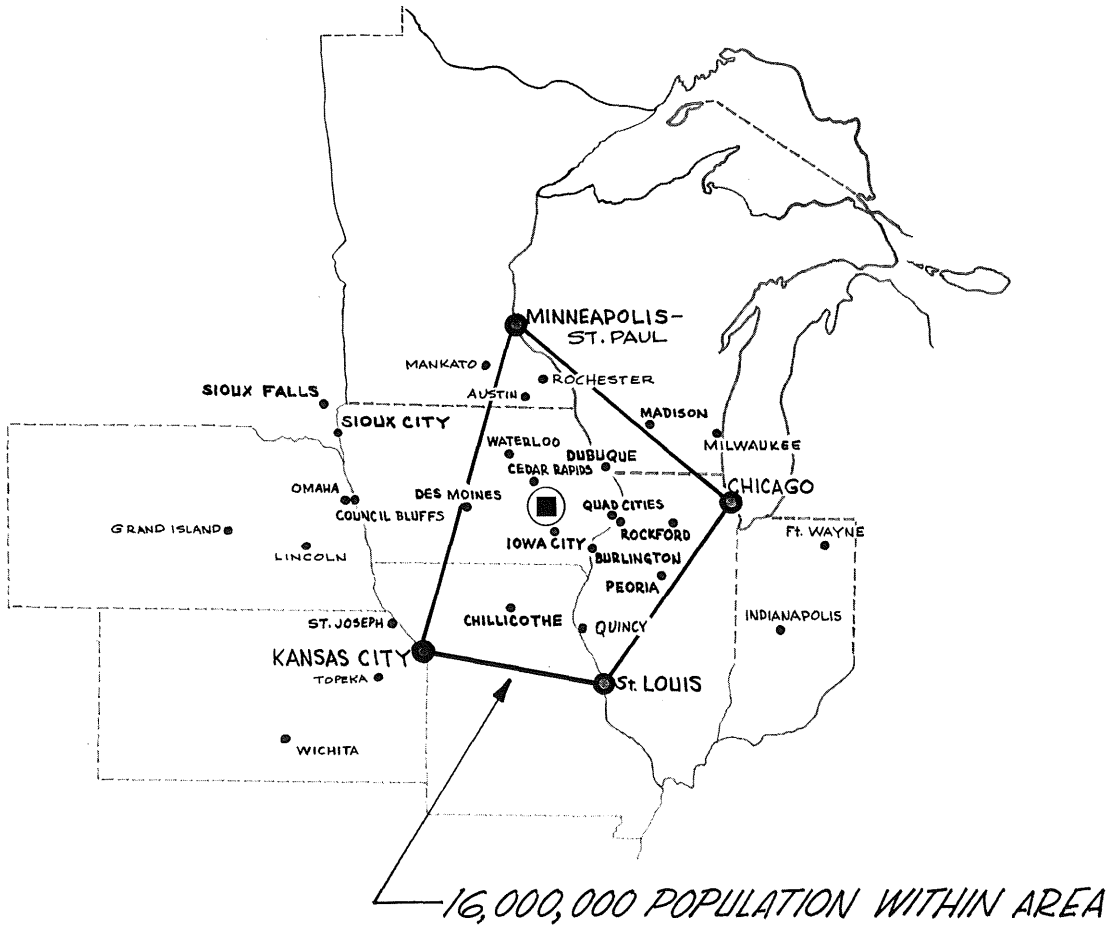
11 OF 41 MEMBERS OF THE  
ASSOCIATION OF AMERICAN UNIVERSITIES



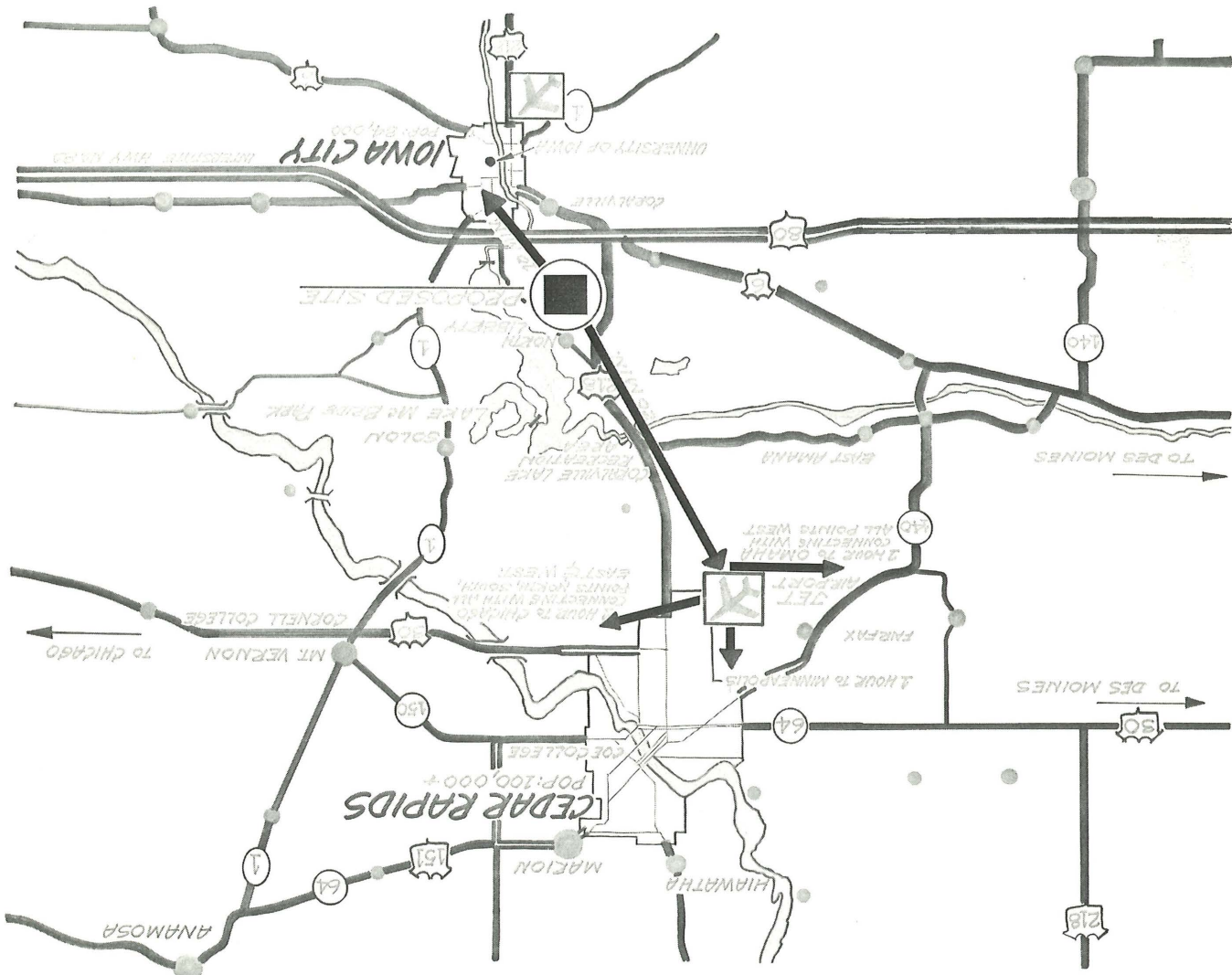
*REGIONAL INDUSTRIAL RESOURCES*



# CENTERS FOR POTENTIAL GROWTH IN ELECTRONICS



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WITHDRAWN  
IOWA STATE TRAVELING LIBRARY  
-DES MOINES, IOWA



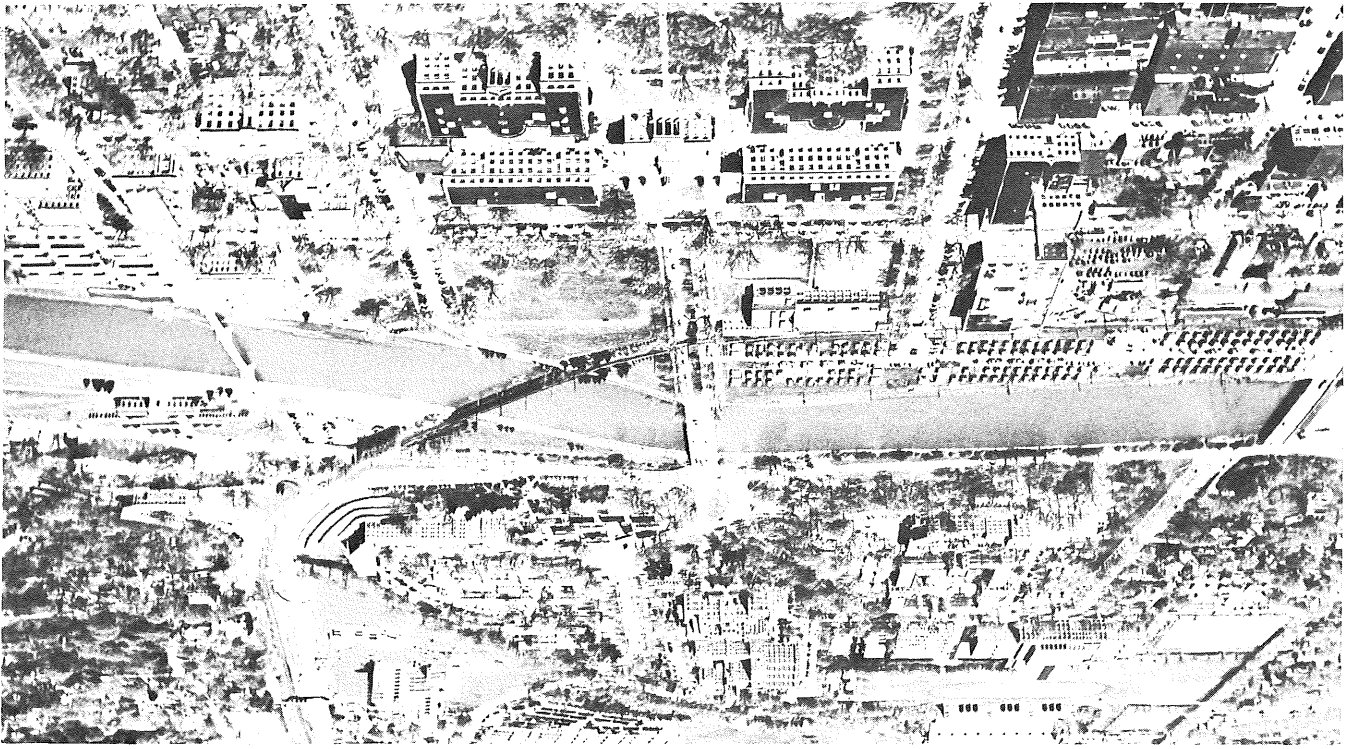
IMMEDIATE ENVIRONMENT  
PROPOSED SITE





TOTAL STUDENT ENROLLMENT: 17,000

○ LAW:	413
○ GRADUATE:	2,780
○ ENGINEERING:	494
○ DENTISTRY:	261
○ BUSINESS ADMINISTRATION:	465
○ LIBERAL ARTS:	7,280
○ MEDICINE:	631
○ NURSING:	429
○ PHARMACY:	170



THE STATE UNIVERSITY OF IOWA



## THE UNIVERSITY OF IOWA



- 25<sup>TH</sup> LARGEST AMERICAN UNIVERSITY
- RANKS 22<sup>ND</sup> AMONG UNIVERSITIES IN PHYSICAL SCIENCES DOCTORATES AWARDED
- RANKS 18<sup>TH</sup> IN DOCTORATES AWARDED IN ALL FIELDS
- SITE OF MAJOR MEDICAL CENTER
- INTERNATIONALLY RECOGNIZED FOR WORK IN VARIOUS AREAS: SPEECH PATHOLOGY, HYDRAULICS, THE ARTS, ZOOLOGY, MATHEMATICS, PHYSICS, AND SPACE SCIENCES

THE UNIVERSITY OF IOWA  
OFFERS:



- PARTICIPATION IN THE ACADEMIC, CULTURAL, RECREATIONAL ACTIVITIES OF A VITAL CAMPUS COMMUNITY
- ADJUNCT FACULTY APPOINTMENTS FOR INTERESTED, PROPERLY QUALIFIED NASA STAFF
- PROGRAMS OF UNDERGRADUATE, GRADUATE AND ADVANCED DEGREE STUDY (B.A., B.S., M.S., PH.D.)

## SPACE SCIENCE AT THE UNIVERSITY OF IOWA



- PIONEERING RADIATION MEASUREMENTS AT HIGH ALTITUDES IN THE ARCTIC AND ANTARCTIC, 1951-1959
- EXTENSIVE EXPERIENCE WITH HIGH ALTITUDE BALLOONS AND ROCKETS, 1951-1960
- PIONEERING RADIATION MEASUREMENTS WITH FIRST U.S. SATELLITE, EXPLORER I
- DISCOVERY OF EARTH'S RADIATION BELTS, 1958
- COMPREHENSIVE STUDY OF RADIATION ENVIRONMENT OF THE EARTH WITH EXPLORER I, EXPLORER III, EXPLORER IV, PIONEER III, PIONEER IV, EXPLORER VII, INJUN I, EXPLORER XII, EXPLORER XIV, EXPLORER XV, TRAAC, RELAY I, INJUN III
- PIONEERING RADIATION MEASUREMENTS IN INTERPLANETARY SPACE WITH PIONEER III, PIONEER IV AND MARINER II, AND NEAR PLANET VENUS WITH MARINER II
- DESIGN, DEVELOPMENT AND CONSTRUCTION OF INJUN SATELLITE SERIES
- EXTENSIVE SURVEYS OF SOLAR COSMIC RAY EVENTS WITH EXPLORER IV, EXPLORER VII, EXPLORER XII, EXPLORER XV, INJUN I, INJUN III, AND MARINER II
- OBSERVATION OF ARTIFICIALLY PRODUCED RADIATION BELTS BY TEAK, ORANGE, ARGUS, STARFISH, AND SOVIET HIGH ALTITUDE ATOMIC BURSTS WITH EXPLORER IV, INJUN I, INJUN III, AND EXPLORER XIV

SPACE SCIENCE AND TECHNOLOGY CENTER CONT'D

- CONSULTATION WITH GOVERNMENTAL AND INDUSTRIAL LABORATORIES ON RADIATION HAZARDS OF SPACE FLIGHT
- HOLDER OF 20 NASA GRADUATE TRAINEESHIPS
- CONSTRUCTING OVER 100,000 SQ.FT. PHYSICS RESEARCH BUILDING AND RESEARCH OBSERVATORY WITH STATE OF IOWA, NASA, AND NSF FINANCING
- FOURTEEN PH.D'S AND FORTY M.S. AND M.A. DEGREES IN SPACE SCIENCE, 1951-1963
- STRONG CONTINUING PROGRAM, ABOUT \$1,000,000 PER YEAR SUPPORT IN SPACE RESEARCH BY NASA AND THE OFFICE OF NAVAL RESEARCH
- LARGE SCALE PARTICIPATION BY UNDERGRADUATE AND GRADUATE STUDENTS IN ALL PHASES OF WORK
- STUDIES OF LIFE SUPPORT SYSTEMS FOR MANNED SPACE FLIGHT
- STUDIES OF THE INFLUENCE OF SUSTAINED HIGH-G LIMITATIONS ON GROWTH OF LOWER ANIMALS
- DEVELOPMENT OF BIOMEDICAL TRANSDUCERS FOR USE IN MANNED SPACE FLIGHT

## THE IOWA CITY COMMUNITY



- WHERE HOME AND WORK ARE 15 MINUTES APART
- SUPERIOR SCHOOLS — NO SHIFTS
- FAMILY RECREATION FACILITIES IN ABUNDANCE  
OUTDOOR ACTIVITIES, BIG TEN ATHLETIC CONTESTS,  
WATER RESOURCES — RIVER, LAKE, RESERVOIR
- YEAR-ROUND OFFERING OF CULTURAL EVENTS
- SERVED BY TWO AIRPORTS -- 34 FLIGHTS DAILY
- GOOD ACCOMMODATIONS FOR VISITORS,  
CONFERENCE GROUPS

IN THE ADJACENT AREA



CEDAR RAPIDS (35-MINUTE DRIVE FROM IOWA CITY,  
20 MINUTES FROM PROPOSED SITE)

- POPULATION 100,000+
- SUPERIOR SCHOOL SYSTEM
- OUTSTANDING SHOPPING DISTRICT
- 1,200 FIRST-CLASS HOTEL AND MOTEL ROOMS

DAVENPORT (AND THE QUAD CITY COMPLEX)

- 60-MINUTE DRIVE FROM IOWA CITY ON INTERSTATE 80
- MISSISSIPPI RIVER RECREATION AREAS, WATER SPORTS

STATE PARKS--SCENIC HIGHWAYS AND WATERWAYS

HISTORIC SITES--AMANA VILLAGES



THE IOWA CITY AREA  
AS A  
FAVORABLE ENVIRONMENT FOR THE NASA ELECTRONICS CENTER.

- COLLINS RADIO COMPANY IN THE NEARBY AREA HAS THRIVED.
- COLLINS RESEARCH & ENGINEERING COMPLEX IS NOW ABOUT SAME SIZE AS PROJECTED SIZE OF NASA LABORATORY.
- COLLINS HAS IN CEDAR RAPIDS ABOUT 10,000 EMPLOYEES OF WHICH 1,400 ARE COLLEGE GRADUATES.

1327 - BS DEGREES

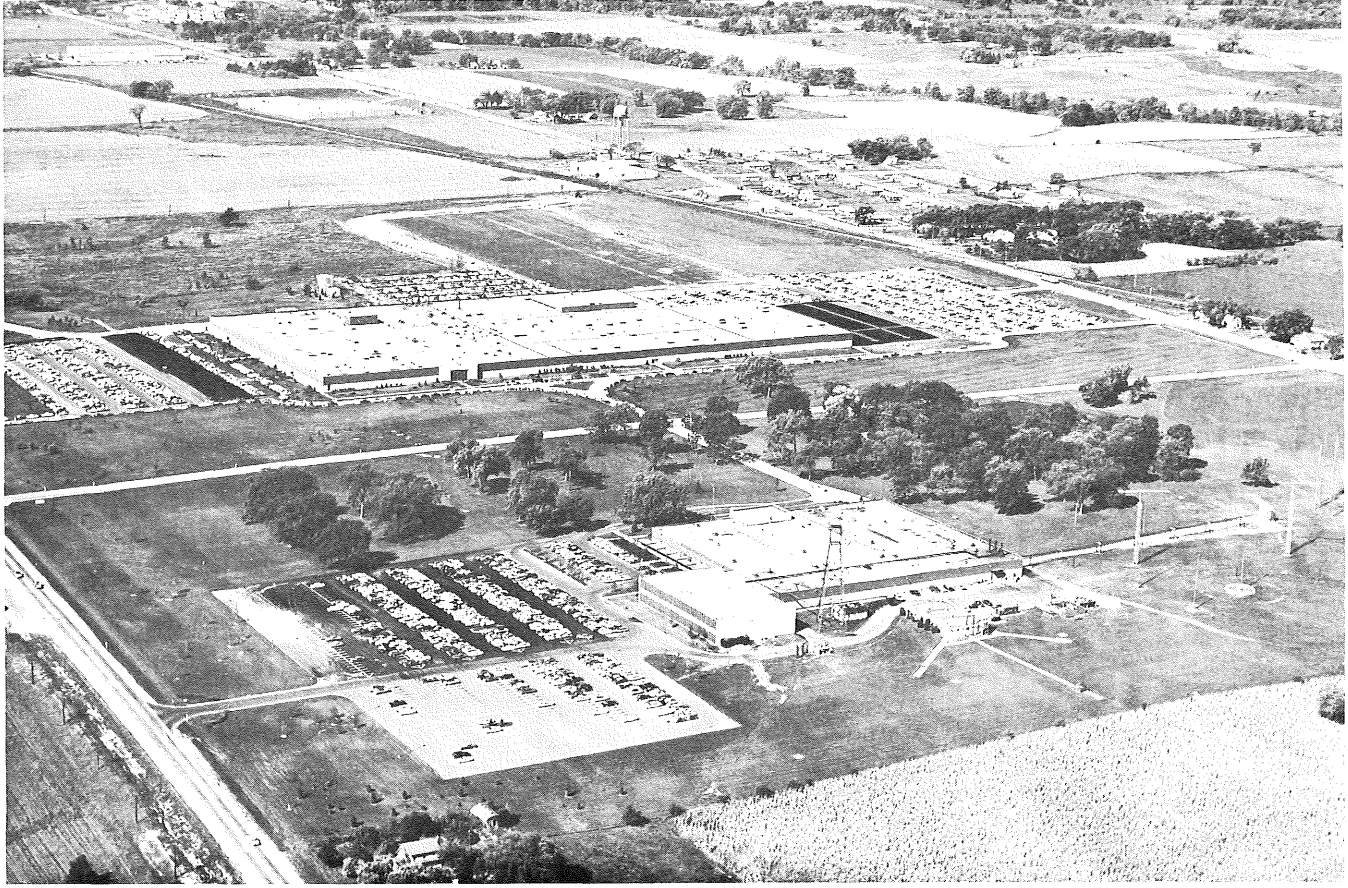
153 - MASTER'S DEGREES

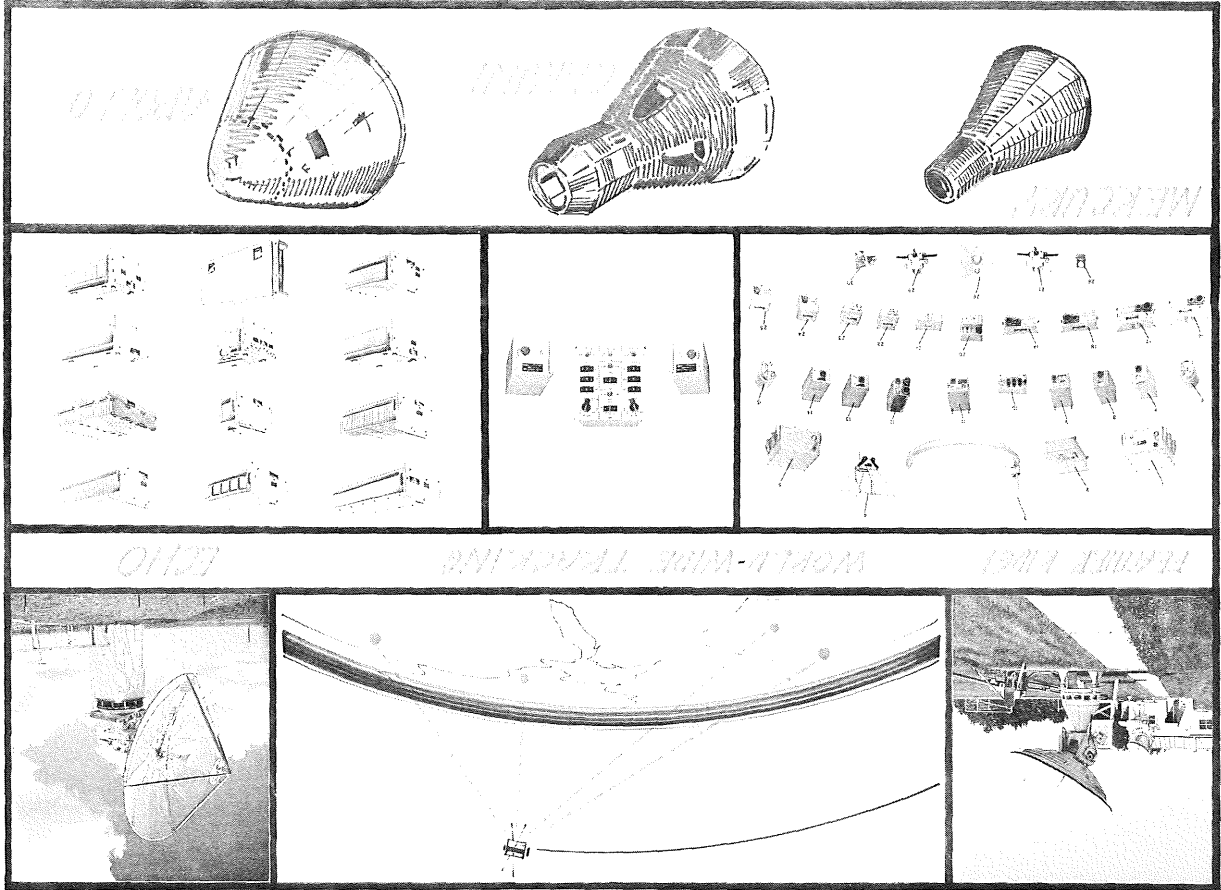
18 - PHD DEGREES

- COLLINS HAS IN CEDAR RAPIDS ABOUT 1,500,000 SQ. FEET OF PLANT AREA 315,000 SQ. FEET FOR RESEARCH & ENGINEERING.
- COLLINS ENGINEERING & RESEARCH HAS WIDE RANGE OF ELECTRONICS ACTIVITY CLOSELY PARALLELING THE NASA ACTIVITY.
- COMMUNITY HAS HAD NO TROUBLE PROVIDING HOUSING, SCHOOLS, SHOPPING CENTERS, CULTURAL & RECREATIONAL ACTIVITIES FOR SUCH A HIGHLY TRAINED TECHNICAL GROUP.
- SIMILAR FAVORABLE ENVIRONMENT WOULD EXIST IN IOWA CITY FOR GROWTH OF THE NASA CENTER.



*COLLINS RESEARCH & ENGINEERING COMPLEX...*



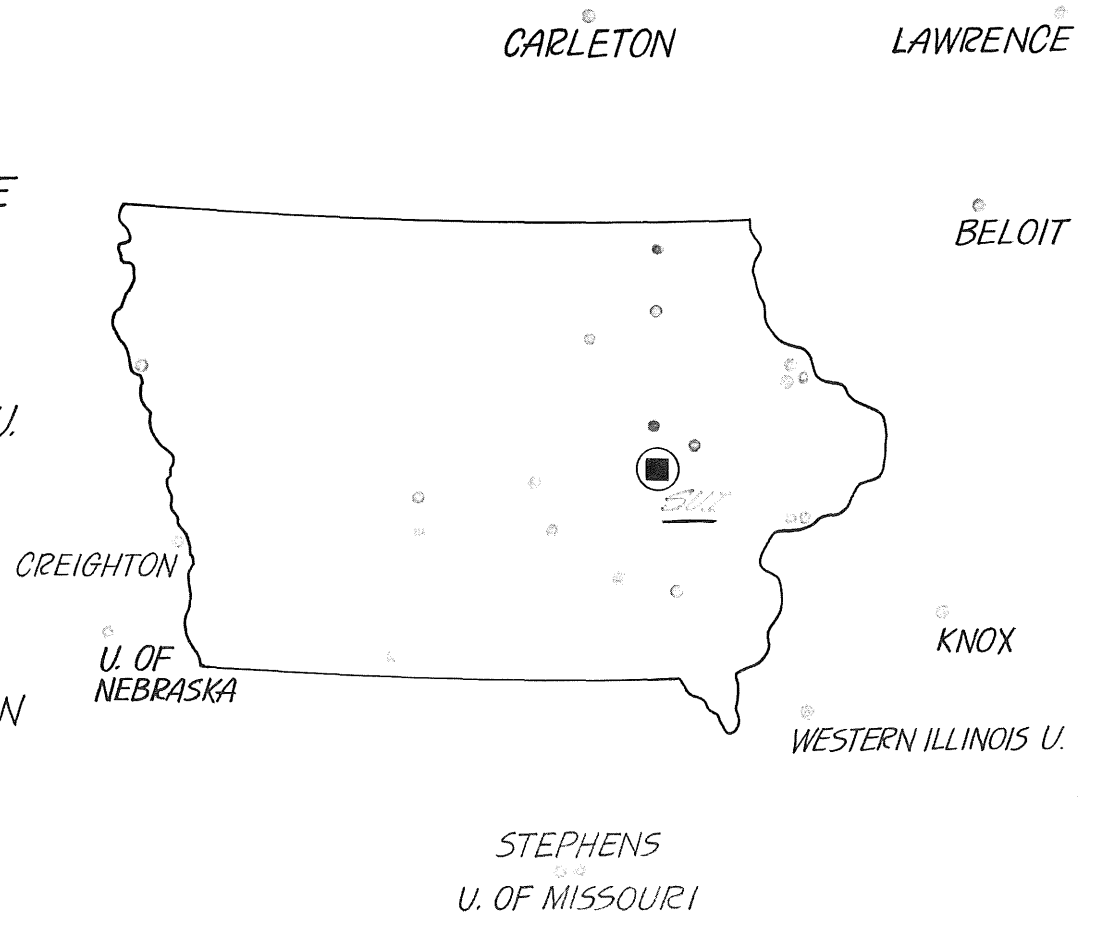


TYPICAL COLLINS DESIGN IN NASA SPACE APPLICATIONS

ADDITIONAL COLLEGES  
NEAR AND AROUND ILL.



- COE
- CORNELL
- GRINNELL
- U. OF DUBUQUE
- DRAKE U.
- LORAS
- CLARKE
- UPPER IOWA U.
- WARTBURG
- LUTHER
- ST. AMBROSE
- MARYCREST
- IOWA WESLEYAN
- PARSONS
- WILLIAM PENN
- MORNINGSIDE
- GRACELAND
- SIMPSON



## AN IOWA CITY LOCATION OFFERS NASA:



- POSITION IN MIDST OF 14 MAJOR MIDWEST UNIVERSITIES, 13 OF THEM PRODUCING GRADUATE ENGINEERS
- READY ACCESS TO HIGH-QUALITY, SPECIAL-PURPOSE FACILITIES -- JOB SHOPS, ETC
- UNLIMITED OPPORTUNITIES FOR DEVELOPMENT AND GROWTH OF SUPPORTING INDUSTRIES
- AMPLE SKILLED, SEMISKILLED, AND READILY TRAINABLE PERSONNEL FOR SUPPORT OF THE PROFESSIONAL STAFF
- CLOSE UNIVERSITY CONTACT -- POSTGRADUATE STUDY OPPORTUNITIES -- CULTURAL AND ATHLETIC EVENTS
- PLEASANT FAMILY LIVING CONDITIONS -- UNCONGESTED CITIES, EXCELLENT SCHOOLS, AND UNCROWDED COLLEGES

SOCIOLOGICAL & ECONOMIC REASONS  
FOR A  
MID-AMERICA SITE



- PAST TRENDS TOWARD CONCENTRATION OF RESEARCH AND INDUSTRY IN COASTAL AREAS SHOULD BE DECELERATED, NOT ONLY FOR REASONS OF NATIONAL DEFENSE . . . . .
- OVERCROWDING RESULTS IN SEVERE SOCIOLOGICAL PROBLEMS RELATED TO THE LIVING CONDITIONS AND WELFARE OF PEOPLE IMMERSSED IN "BIGNESS."
- CONCENTRATION IS NOT GOOD IN TERMS OF NATIONAL DEFENSE.
- CONTENTMENT OF THE STAFF IN A PEACEFUL, UNCROWDED AREA IS CONDUCTIVE TO CREATIVE RESEARCH AND PRODUCTIVITY.
- STIMULATED BY AN IMPORTANT RESEARCH INSTALLATION AT ITS CENTER, MID-AMERICA WILL UNLEASH ITS RESOURCES TO CONTRIBUTE SUBSTANTIALLY TO THE SPACE PROGRAM-AND TO A MORE BALANCED ECONOMIC GROWTH FOR THE U.S.
- RECOMMENDATION:

A MID-AMERICA SITE IS IN THE BEST INTERESTS OF THE U.S. FOR BOTH SOCIOLOGICAL AND ECONOMIC REASONS . . . . .



LOCATED IN THE MIDWEST,  
THE ELECTRONIC RESEARCH CENTER  
WOULD TAP THE IMMENSE INDUSTRIAL  
AND EDUCATIONAL RESOURCES OF THE AREA  
IN SUPPORT OF  
THE NATIONAL SPACE PROGRAM

## Foreword

The following written material supplements the preceding flip charts shown during the oral presentation and supplies more detailed information which may be of interest.

## Educational productivity of the mid-America region

Iowa City and the University of Iowa are located in the heart of a region traditionally strong in university-level education in the sciences and engineering. Within or immediately adjacent to the area bounded by Minneapolis, St. Paul, Chicago, St. Louis, and Kansas City are 14 large (7,000 to 35,000 students) universities, all but one of which (Chicago) educates engineers, and all with sizable graduate programs. These universities enrolled 233,037 students last year and awarded 1,511 Ph.D. degrees in the physical sciences, mathematics, and engineering (23 percent of all such degrees awarded throughout the nation last year).

Among these 14 institutions are six of the "Big Ten" universities, four of the "Big Eight," and 12 of the 41 members of the Association of American Universities. A recent tabulation showed that the State of Iowa ranks third among all states in the production of Ph.D.'s per capita.



## Technological potential of the mid-America region

There has been a substantial increase in electronics production and research activity within this region in recent years. Any desired service of the "job shop" variety is available within approximately an hour's time from any point near the center of the region.

One of the nation's major electronics firms, well known to NASA for its work in space communications for the Mercury, Gemini, Apollo, and deep-space ground tracking facilities and for its participation in the Echo communications program, is located within minutes of Iowa City and the proposed site: the Collins Radio Company of Cedar Rapids. With nearly 10,000 employees and one and a half million square feet of modern space devoted to electronics production and research, Collins possesses one of the leading electronic-systems capabilities in the United States.

Also in the vicinity of the proposed site is the Davenport plant of Bendix Aviation's Pioneer Central Division. Both Bendix and Collins sponsor basic research efforts at the State University of Iowa, and both depend upon the university for in-plant postgraduate instruction for professional staff members.

Within the three cities - Cedar Rapids, Iowa City, and Davenport - may be found 809 members of the IEEE--the largest such concentration of electronics engineers between Chicago and Denver.

There is a growing supply of electronics technicians, due to the increasing number of plants within the Eastern Iowa region, for example, Philco at Fairfield; Minneapolis-Honeywell at Independence; Sylvania at Burlington; and the unique Measurement Research Center (electronic test scoring and reporting) at Iowa City.

Formal educational programs in high schools and community colleges will contribute trained technicians as the need develops for example, the Technical Institute recently established at Davenport provides training in electronics and computer technology. Iowa State University provides high quality training in a two-year Technical Institute at Ames and it is anticipated that another institute will be established in Iowa City by the University of Iowa.

## **Advantages of a site in the Iowa City area --I**

### **Close relationship with the University of Iowa**

The University of Iowa offers a broad, liberal arts-graduate-professional program to its nearly 13,000 students. It is a member of the Association of American Universities. Its 1963-64 full-time enrollment of 12,923 students puts the university in 25th place for size among the nation's colleges and universities. Currently it ranks 22nd among all American universities in the number of doctorates conferred in the physical sciences, and 18th in doctorates conferred in all fields. Bachelor of arts, bachelor of science, master of arts, and master of science degrees also are conferred in many fields, as are professional degrees in law, medicine, dentistry, and pharmacy.

The university offers a year-round program of cultural activities to residents of the Iowa City area. Lectures, plays, operas, concerts, and art exhibits are frequent and readily accessible. The university also furnishes leisure-time enjoyment for both the sports participant and spectator. Tennis courts, golf courses, indoor swimming pools, and gymnasiums are ready for the active person, and Big Ten varsity competition in eleven sports attracts fans in quantity.

Should the Electronics Research Center be established in the area, the university would anticipate making adjunct appointments to its faculty of properly qualified Research Center staff members. Participation by NASA staff members in the university's academic, cultural, and recreational activities would be encouraged and facilitated.

## **Other university highlights**

Many departments and areas of the University of Iowa have achieved a world-wide prominence and accomplishments far beyond the ordinary:

The Department of Speech Pathology and Audiology leads the world in stuttering and speech therapy. The science was born at Iowa, where more speech correctionists have been educated than at any other university in the United States.

The Institute of Hydraulics Research is known internationally for its research in hydraulics engineering and attracts graduate students from around the globe.

The College of Medicine and the university's hospitals comprise one of the major medical treatment and research centers of the Midwest.

The Department of Mathematics has long been recognized as one of the nation's leading sources of young people educated in actuarial science and quality control.

The Department of Zoology is particularly noted for its research in reproductive physiology, as well as for the preparation of teachers and researchers.

Since its founding more than 35 years ago, the School of Religion has attracted wide attention as a successful experiment in interfaith teaching of religion in a state university.

A strong program in the creative arts has been a characteristic of the University of Iowa for many years. The Art and Music Departments produce faculty and students who consistently win awards and wide recognition for their paintings, sculptures, prints, compositions, and performances; and the University Theatre was for years almost alone in its work in the development of the experimental theater. The Writers' Workshop at Iowa has achieved a high degree of success as a proving ground for young poets and novelists.

## Space Science at the University of Iowa

Following is a summary of major space science involvements at the university during the past decade:

Pioneering radiation measurements at high altitudes in the Arctic and Antarctic (1951-1959).

Extensive experience with high altitude balloons and rockets (1951-1960).

Pioneering radiation measurements with first US Satellite Explorer I.

Discovery of the Earth's Radiation Belts (1958).

Comprehensive study of radiation environment of the earth with Explorer I, Explorer III, Explorer IV, Pioneer III, Pioneer IV, Explorer VII, Injun I, Explorer XII, Explorer XIV, Explorer XV, Traac, Relay I, Injun III.

Pioneering radiation measurements in interplanetary space with Pioneer III, Pioneer IV and Mariner II, and near Planet Venus with Mariner II.

Design, development, and construction of Injun satellite series.

Extensive surveys of solar cosmic ray events with Explorer IV, Explorer VII, Explorer XII, Explorer XIV, Injun I, Injun III and Mariner II.

Observation of artificially produced radiation belts by Teak, Orange, Argus, Starfish, and Soviet high altitude atomic bursts with Explorer IV, Injun I, Injun III, and Explorer XIV.

Consultation with governmental and industrial laboratories on radiation hazards of space flight.

Holder of 20 NASA graduate traineeships.

Constructing over a 100,000-square-foot Physics Research Building and Research Observatory with State of Iowa, NASA, and NSF financing.

Fourteen Ph.D.'s and forty M.S. and M.A. degrees in space science (1951-1963).

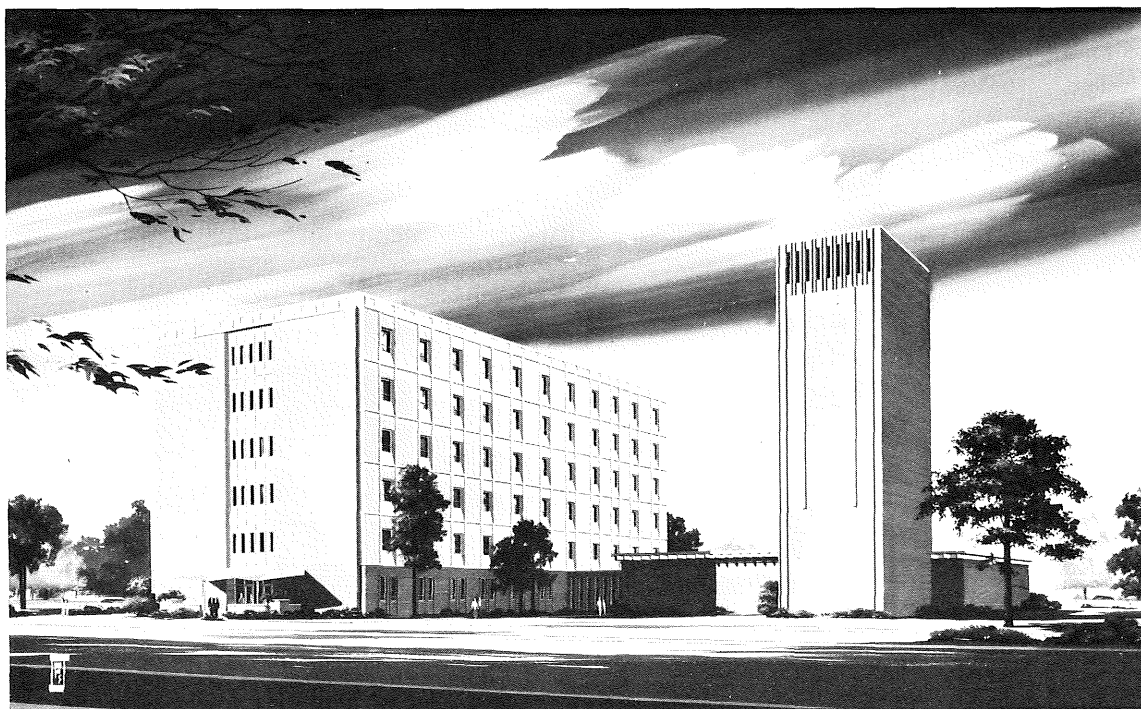
Strong continuing program, about \$1,000,000 per year support in space research by NASA and the Office of Naval Research.

Large scale participation by undergraduates and graduate students in all phases of the work.

Studies of life support systems for manned space flight.

Studies of the influence of sustained high-G limitations on growth of lower animals.

Development of biomedical transducers for use in manned space flight.



Physics Research Center

## Looking ahead

With enrollments continuing to rise as they have done since 1952, the University of Iowa officially anticipates 19,000 students by 1972, although there are now signs that this projection is too conservative.

Gift funds and a generous state appropriation will combine within the next several years to improve facilities for Iowa's already-strong fine arts program. A new gallery to house a famous art collection will be the first step in an anticipated development of a striking new complex for the graphic and performing arts.

Three additions now under construction will greatly enlarge the Iowa Memorial Union and enhance the university's already thriving continuation study program. One addition will provide 110 guest rooms and another will offer conference and meeting rooms. A new seven-story, 275-car parking ramp is part of the Union expansion.

## **Advantages of a site in the Iowa City area --II**

### **Iowa City is a good place to live**

With a population of 34,000, including university students, Iowa City features many advantages of a metropolitan area without the accompanying disadvantages. Uncongested streets and neighborhoods are an especially welcome change to those from more populous areas--Iowa City residents live not more than 15 minutes from their jobs, which fact alone adds many hours to family life.

Iowa City schools are superior in their faculties and in their teaching environment throughout the public and university school systems and the parochial (Roman Catholic) schools.

Readily accessible by auto, train, bus, or plane, Iowa City is on three federal highways, including Interstate 80, and anticipates that a north-south interstate also will pass near the western edge of the city within the next several years. United and Ozark Airlines provide a total of 34 flights daily through the local airport and the Cedar Rapids field, 30 minutes of country driving to the north. The city is on the main line of the Rock Island Railroad.

Because of its nature as a university city and regional medical center, Iowa City is well provided with transient housing facilities--nearly 600 hotel and motel rooms, with more to be constructed in the near future.

New home construction in Iowa City has advanced at a steady pace accompanying the city's growth, and apartment construction has accelerated in recent years. Being a university community, Iowa City has a substantial supply of rental properties.

In the Iowa City community of 34,000 there are 1,800 hospital beds - University Hospitals, Psychopathic Hospital (a part of the university medical center), Veterans Administration Hospital, and Mercy Hospital (Catholic) - skilled doctors in the medical specialties, and many doctors in private practice.

Recreation resources in the Iowa City area in addition to those furnished by the university include two sizable bodies of water - Lake McBride (boating, fishing, swimming, camping, picnic grounds) and the 17-mile-long Coralville Reservoir (boating and fishing); a country club and two public golf courses; several city parks, municipal swimming pool, and a private club which includes a swimming pool.

## Nearby cities add potential

Cedar Rapids, 35 minutes from Iowa City, is the home of several sizable food processing and heavy manufacturing industries, hence also is prepared better than many cities its size (106,000) for transient traffic, with some 1,200 first-class motel and hotel rooms in and adjacent to the city. Cedar Rapids population has been increasing at the rate of about 4000 per year for the last several years. Housing, schools, and recreational facilities have kept pace with this growth. The Cedar Rapids airport, which also serves many Iowa Citizens, can accommodate jet aircraft on its 7,000-foot runway.

Davenport, in the "Quad Cities" (including Moline and Rock Island, Ill., and Bettendorf, on the Iowa side of the Mississippi with Davenport), is 60 to 70 minutes from Iowa City via Interstate 80. It, too, is on the main line of the Rock Island, and is served by 24 United and Ozark flights daily through the Moline Airport. Hotel and motel rooms total more than 1,600.

## Colleges close at hand

There are 26 four-year and 21 two-year colleges in the State of Iowa. A number of them are less than two hours from Iowa City:

Cedar Rapids - Coe College  
Mount Mercy College

Davenport - St. Ambrose College  
Marycrest College  
Augustana College (Rock Island)

Mount Vernon - Cornell College

Mount Pleasant - Iowa Wesleyan College

Grinnell - Grinnell College

Dubuque - University of Dubuque  
Loras College  
Clarke College

The state-supported institutions include, in addition to the State University of Iowa, Iowa State University of Science and Technology at Ames, 120 miles from Iowa City, and State College of Iowa, 95 miles from Iowa City at Cedar Falls.

## **Advantages of a site in the Iowa City area --III**

### **Utilities and services**

Electricity and natural gas are available in ample quantities. Determination of the applicable rates and precise computation of the power costs may be readily accomplished as specific information is forthcoming concerning the ultimate power and fuel requirements of the Center.

Similarly, water and sewage services could be provided with no difficulty on the site under consideration. Detailed technical information on these needs will be provided as desired.

## **Advantages of a site in the Iowa City area --IV**

### **Contribution of site**

It is anticipated that a suitable site for the Research Center could be contributed in either the Oakdale or Coralville areas, which are contiguous to Iowa City.



## Appendix A

Part I. Ph.D.'s in Space Science at S.U.I. 1951-1963.

Part II. M.S.'s or M.A.'s in Space Science at S.U.I.  
1951-1963.

Part III. Former Staff Members in Space Science, now  
Elsewhere.

Department of Physics and Astronomy  
State University of Iowa  
Iowa City, Iowa

Part I. Ph.D.'s in Space Science at S.U.I. 1951-1963

1. Ellis, Robert A., Ph.D., Iowa, February 1954  
(now Physicist, Plasma Physics Laboratory, Princeton,  
New Jersey)  
"The Low Momentum End of the Heavy Cosmic Ray Spectrum"
2. Meredith, Leslie H., Ph.D., Iowa, June 1954  
(now Head, Particles and Fields Branch, Goddard  
Space Flight Center, Greenbelt, Maryland)  
"A Measurement of the Intensity of Low Magnetic Rigidity  
Cosmic Rays Above the Atmosphere"
3. Ray, Ernest C., Ph.D., Iowa, August 1956  
(now Senior Research Associate, Center for Radio-  
physics, Cornell University, Ithaca, New York)  
"Effects of a Ring Current on Cosmic Radiation"
4. Webber, William R., Ph.D., Iowa, August 1957  
(now Assistant Professor of Physics, University of  
Minnesota, Minneapolis, Minnesota)  
"A New Determination of the Intensities of Primary Cosmic  
Ray Alpha Particles and Li, Be, and B Nuclei at  $\lambda = 41.5^\circ$   
Using a Cerenkov Detector"
5. Missert, Raymond F., Ph.D., Iowa, August 1957  
(now Physicist, Cornell Aeronautical Laboratory,  
Buffalo, New York)  
"Day-Night Intensities of Heavy Nuclei and the Star  
Producing Component in the Cosmic Radiation at High  
Altitudes"
6. Schwartz, Melvin, Ph.D., Iowa, February 1958  
(later Department of Physics, Adelphi College,  
Garden City, L. I., New York)  
"On the Penumbra and Simple Shadow Cone of Cosmic Radiation"
7. Kasper, Joseph E., Ph.D., Iowa, August 1958  
(now Head of Department of Physics, Coe College,  
Cedar Rapids, Iowa)  
"Contributions to Geomagnetic Theory"
8. Cahill, Laurence J., Ph.D., Iowa, February 1959  
(now Particles and Fields Branch, Office of Space  
Sciences, NASA, Washington, D. C., and  
Assistant Professor of Physics, University of New  
Hampshire, Durham, N. H.)  
"Magnetic Exploration of the Upper Atmosphere"
9. McIlwain, Carl E., Ph.D., Iowa, June 1960  
(now Associate Professor of Physics, University of  
California in San Diego, La Jolla, California)  
"Direct Measurements of Particles Producing Visible  
Aurorae"

10. Ludwig, George H., Ph.D., Iowa, August 1960 (in E.E.)  
(now EGO Project Scientist, Goddard Space Flight  
Center, Greenbelt, Maryland)  
"The Development of a Corpuscular Radiation Experiment for  
an Earth Satellite"
11. Pizzella, Guido, Ph.D., Iowa, February 1962  
(now University of Rome, Italy)  
"Time Variation of Intensity in the Earth's Inner Radiation  
Zone--October 1959 through December 1960"
12. Sauer, Herbert A., Ph.D., Iowa, August 1962  
(now Physicist, National Bureau of Standards, Boulder, Colorado)  
"A New Method of Computing Cosmic-Ray Cut-Off Rigidity  
for Several Geomagnetic Field Models"
13. Freeman, John W., Ph.D., Iowa, June 1963  
(now Particles and Fields Branch, Office of Space  
Sciences, National Aeronautics and Space Administration,  
Washington, D.C.)  
"The Morphology of the Distribution of Electrons in the  
Outer Radiation Zone and Near the Magnetospheric Boundary  
as Observed by Explorer XII"
14. Lin, Wei-Ching, Ph.D., Iowa, August 1963  
(now Research Associate, State University of Iowa)  
"Observations of Solar and Galactic Cosmic Rays with Satellite  
Explorer VII, October 1959 to February 1961"

Part II. M.S.'s or M.A.'s in Space Science at S.U.I. 1951-1963

1. Mitchell, Earl M., M.S., Iowa, February 1951  
(later Ph.D. University of Minnesota)  
"The Analysis of Cosmic Ray Tracks in Photographic  
Emulsions"
2. Johnson, Herbert A., M.A., Iowa, June 1952  
(later Applied Physics Laboratory, Johns Hopkins  
University)  
(Development of Cosmic-Ray Balloon Telemetry Equipment)
3. Meredith, Leslie H., M.S., Iowa, June 1952  
(later Ph.D. Iowa, June 1954)  
(now Head, Particles and Fields Branch, Goddard  
Space Flight Center)  
"A Measurement of the Vertical Cosmic Ray Intensity as a  
Function of Altitude"
4. Placios, Robert C., M.S., Iowa, June 1953  
(later National Bureau of Standards, Washington, D.C.)  
"The Efficiency of a Hydrogen-Filled Geiger Tube"
5. Ray, Ernest C., M.S., Iowa, June 1953  
(later Ph.D. Iowa, August 1956)  
(now, Senior Research Associate, Center for Radiophysics,  
Cornell University, Ithaca, New York)  
"Integrated Cosmic Ray Intensity as a Function of Altitude"

6. Tuckfield, Ralph, M.S., Iowa, February 1954  
(now General Atomics, San Diego, California)  
"Fluctuations of Cosmic Ray Intensity at Balloon Altitudes"
7. Kasper, Joseph, M.S., Iowa, February 1955  
(later Ph.D. Iowa, August 1958)  
(now, Head of Department of Physics, Coe College,  
Cedar Rapids, Iowa)  
"Construction and Application of a Mechanical Differential Analyzer"
8. Webber, William R., M.S., Iowa, February 1955  
(later Ph.D. Iowa, June 1957)  
(now, Assistant Professor of Physics, University of  
Minnesota, Minneapolis, Minnesota)  
"A Determination of the Intensities of the Low Z Components  
of the Primary Cosmic Radiation with a Cerenkov Detector"
9. Buttrey, Kenneth E., M.S., Iowa, February 1955  
(now Physicist, North American Aviation Company)  
"Average Primary Specific Ionization of Cosmic Rays as  
a Function of Altitude"
10. Missert, Raymond F., M.S., Iowa, June 1955  
(later Ph.D. Iowa, August 1957)  
(now Physicist, Cornell Aeronautical Laboratory,  
Buffalo, New York)  
"High Altitude Intensity of Heavy Cosmic Ray Nuclei and  
Star Producing Component over a Twenty- Five Hour  
Interval"
11. Cahill, Laurence J., M.S., Iowa, June 1956  
(later Ph.D. Iowa, February 1959)  
(now Particles and Fields Branch, Office of Space  
Sciences, NASA, Washington, D.C., and  
Assistant Professor of Physics, University of New  
Hampshire, Durham, N. H.)  
"High Altitude Measurements of the Earth's Magnetic  
Field with a Proton-Precession Magnetometer"
12. McIlwain, Carl E., M.S., Iowa, June 1956  
(later Ph.D. Iowa, June 1960)  
(now Associate Professor of Physics, University of  
California in San Diego, La Jolla, California)  
"Cosmic Ray Intensity Above the Atmosphere at Northern  
Latitudes"
13. Graves, Wayne H., M.S., Iowa, February 1958  
(later Collins Radio Company, Cedar Rapids, Iowa)  
"The Propagation of Whistling Atmospherics"
14. Anderson, Hugh R., M.S., Iowa, June 1958  
(later Ph.D. California Institute of Technology)  
"Zenith Angle Dependence of Cosmic Ray Flux as a Function  
of Altitude"

15. Budner, Alan, M.S., Iowa, August 1958  
(later Redstone Arsenal, Huntsville, Alabama)  
"Effects of Solar Magnetic Field on Impact Zones"
16. Ludwig, George H., M.S., Iowa, February 1959  
(later Ph.D. Iowa, August 1960)  
(now EGO Project Scientist, Goddard Space Flight Center,  
Greenbelt, Maryland)  
"The Instrumentation on Earth Satellite 1958  $\gamma$ "
17. Rife, David O., M.S., Iowa, February 1959  
(now Convair, Pomona, California)  
"The Angular Motion of Rockets in Thin Air"
18. Conrath, Barney J., M.A., Iowa, August 1959  
"A Handbook of the Celestial Mechanics of Earth Satellites"
19. Chinburg, Dale L., M.S., Iowa, June 1960 (in E.E.)  
(now Research Engineer, State University of Iowa)  
"Design, Construction and Operation of a Proton  
Precession Magnetometer"
20. Laughlin, Curtis A., M.S., Iowa, August 1960  
(now Department of Space Sciences, Rice University,  
Houston, Texas)  
"A Satellite-Borne Magnetic Electron Spectrometer"
21. Freeman, John W., M.S., Iowa, February 1961  
(later Ph.D. Iowa, June 1963)  
(now, Particles and Fields Branch, Office of Space  
Sciences, National Aeronautics and Space Administration,  
Washington, D.C.)  
"A Satellite-Borne Cadmium Sulfide Total Corpuscular Energy  
Detector"
22. Lynch, Robert H., M.S., Iowa, February 1961  
(now Department of Physics, Northern Illinois University,  
DeKalb, Illinois)  
"Calculation of Vertical Cut-Off Rigidities of Charged  
Particles in a Sixth Order Magnetic Field"
23. Bergeson, John E., M.S., Iowa, June 1961  
"The Restricted Three-Body Problem"
24. Bergren, Dick A., M.S., Iowa, June 1961  
"Tunnel Diodes"
25. Frank, Louis A., M.S., Iowa, August 1961  
(now NASA Research Fellow, State University of Iowa)  
"Efficiency of a Geiger-Mueller Tube for Non-Penetrating  
Electrons"
26. Eddie, John W., M.S., Iowa, August 1961  
(now Assistant Professor of Physics, Iowa Wesleyan  
College, Mt. Pleasant, Iowa)  
"Semi-Empirical Theories of the Electron Affinities of  
Negative Atomic Ions"

27. Lin, Wei-Ching, M.S., Iowa, August 1961  
(now Research Assistant, State University of Iowa)  
"Observation of Galactic and Solar Cosmic Rays from  
October 13, 1959 to February 17, 1961 with Explorer VII  
(Satellite 1959 Iota)"
28. Ingram, F. Duane, M.S., Iowa, August 1961  
(now Department of Physics, Wisconsin State College,  
Platteville, Wisconsin)  
"Electronic Image Devices for the Detection of Faint  
Light Sources"
29. Dennison, Daniel C., M.S., Iowa, June 1962  
(Lt., US Navy)  
"Study of Electrons in the Earth's Inner Radiation Zone"
30. Chang, Phillip, M.S., Iowa, June 1962  
"A Rudimentary Discussion of Alfvén Waves"
31. Enemark, Donald C., M.S., Iowa, August 1962 (in E.E.)  
(now Instructor of Physics, State University of Iowa)  
"Electrical Design of the Radiation Effects Experiment  
for the Satellite Relay"
32. Morozumi, Henry M., M.S., Iowa, August 1962  
(now Chief Scientist, Byrd Station, Antarctica)  
"A Study of the Aurora Australis in Connection with an  
Association between VLF Hiss and Auroral Arcs and Bands  
Observed at South Geographical Pole 1960"
33. Gardner, James B., M.S., Iowa, February 1963  
"Lifetimes of Low-Energy Geomagnetically Trapped Protons"
34. Groskreutz, Harvey E., M.S., Iowa, February 1963  
(now Department of Physics, Mankato State College,  
Mankato, Minnesota)  
"A Determination of the Average Atmospheric Density in  
the Path of a Charged Particle Trapped in the Earth's  
Magnetic Field"
35. Krimigis, Stamatios M., M.S., Iowa, February 1963  
(now NASA Research Fellow, State University of Iowa)  
"Satellite Observations of Solar Cosmic Rays from September 6  
to September 16, 1961"
36. Thissell, James D., M.S., Iowa, February 1963  
(now Research Assistant, State University of Iowa)  
"Cadmium Sulphide Total Energy Flux Detectors in  
Ranger I and II Spacecraft"
37. Terashita, Yoichi, M.S., Iowa, June 1963  
(now Research Assistant, State University of Iowa)  
"Study of the Theories of Non-Grey Stellar Atmospheres and  
Application to Atmosphere of Solar Type Stars"

38. Gurnett, Donald A., M.S., Iowa, August 1963  
(now NASA graduate trainee, State University of Iowa)  
"Very Low Frequency Electromagnetic Emissions Observed with the Satellite Injun III"
39. Stilwell, Donald E., M.S., Iowa, August 1963  
(now research assistant, State University of Iowa)  
"Study of Electron Spectra at High Latitudes During Intense Events"
40. Fillius, R. Walker, M.S., Iowa, August 1963  
(now NASA graduate trainee, State University of Iowa)  
"Satellite Instruments Using Solid State Detectors"

Part III. Former Staff Members in Space Science, Now Elsewhere

1. Gottlieb, Melvin B., Ph.D., University of Chicago, August 1950  
At Iowa 1950-1954  
(now Director, Plasma Physics Laboratory, Princeton University)
2. Anderson, Kinsey A., Ph.D., University of Minnesota, 1955  
At Iowa 1955-1959  
(now Assistant Professor of Physics, University of California, Berkeley, California)
3. McDonald, Frank B., Ph.D., University of Minnesota, 1955  
At Iowa 1953-1959  
(now Particles and Fields Branch, Goddard Space Flight Center, Greenbelt, Maryland)
4. Rothwell, Pamela, M.A., Smith College Northampton, Mass., 1948; St. Hugh's College, Oxford, England, 1951  
At Iowa 1958-1960  
(now Department of Physics, University of Birmingham, Birmingham, England)
5. Rosser, W. G. V., Ph.D., University of Manchester, England  
At Iowa 1961-1962  
(now University of Exeter, Exeter, England)
6. Chapman, Sydney, D.Sc., University of Manchester, England, 1912  
At Iowa 1954-1955  
(now Geophysical Institute, University of Alaska, College, Alaska)
7. Forbush, Scott E.  
At Iowa 1960-1961 and 1962  
(now Department of Terrestrial Magnetism, Carnegie Institution of Washington)
8. Yoshida, Sekido  
At Iowa 1959-1960  
(now University of Kyoto, Japan)



9. O'Brien, Brian J., Ph.D., University of Sydney, Australia,  
December 1957  
At Iowa 1959-1963  
(now Professor of Space Science, Rice University,  
Houston, Texas)
  
10. Maehlum, Bernt N., Ph.D., University of Oslo, 1961  
At Iowa 1961-1962  
(now at Norwegian Defense Research Establishment, Oslo, Norway)

## Appendix B

Department of Physics and Astronomy  
State University of Iowa  
Iowa City, Iowa

Publications in Space Science

1951-1963

1. Preliminary Report on Atmospheric Ozone Measurements from  
Rockets  
J. A. Van Allen and J. J. Hopfield  
L'etude optique de l'atmosphère terrestre  
Memoirs in-8 de la Societe Royale des Sciences  
de Liege Quatrieme Serie Tome XII Fasc. I-II (1951)
2. Intensities of Heavy Cosmic-Ray Primaries by Pulse  
Ionization Chamber Measurements  
J. A. Van Allen  
Phys. Rev. 84, 791-797 (1951)
3. Fluctuations in the Energy-Loss of Fast Electrons in a  
"Proportional Counter"  
P. Rothwell  
Proc. Phys. Soc. (London) B, 64, 911-915 (1951)
4. On the High Energy Nuclear Photoelectric Reaction  
S. Yoshida  
Letter in Progr. Theoret. Phys. (Kyoto) 6, 1032-34 (1951)
5. The Angular Motion of High Altitude Rockets  
J. A. Van Allen  
pp. 412-431, "Physics and Medicine of the Upper Atmosphere"  
Editors C. S. White and O. O. Benson, Jr.  
University of New Mexico Press (1952)
6. The Nature and Intensity of the Cosmic Radiation  
J. A. Van Allen  
Chap. XIV, pp. 239-266, "Physics and Medicine of the Upper  
Atmosphere", edited by C. S. White and O. O. Benson, Jr.  
University of New Mexico Press (1952)
7. An Improved Cerenkov Detector for Cosmic Rays  
Kinsey Anderson and John Winckler  
Rev. Sci. Instr. 23, 765 (1952)

- 8a. Apparent Absence of Low Energy Cosmic-Ray Primaries  
J. A. Van Allen and S. F. Singer  
Nature 170, 62-63 (1952)
- 8b. The Distribution of Atmospheric Ozone between 25 and 65 km  
Altitude  
J. A. Van Allen  
Phys. Rev. 88, 176 (1952)
9. Cosmic-Ray Intensity Above the Atmosphere Near the  
Geomagnetic Pole  
J. A. Van Allen  
Bulletin American Physical Society, Vol. 7, No. 5 (1952)  
Invited paper St. Louis Meeting A.P.S. November 28-29, 1952
10. Pressures, Densities, and Temperatures in the Upper  
Atmosphere--The Rocket Panel  
J. A. Van Allen  
Phys. Rev. 88, 1027-1032 (1952)
11. Report of the Standing Committee on Problems of the Upper  
Atmosphere, 1951-1952  
W. W. Kellogg et al.  
Transactions, American Geophysical Union 34, 115-121 (1953)
12. Report of the Standing Committee on Problems of the Upper  
Atmosphere, 1951-52  
W. W. Kellogg et al.  
Transactions, American Geophysical Union 32, 755-759 (1951)
13. The Cosmic-Ray Intensity Above the Atmosphere Near the  
Geomagnetic Pole  
J. A. Van Allen  
Nuovo Cimento 10, 630-647 (1953)
14. Latitude Effect of the Intensity Decrease in the Cosmic  
Ray Storm  
S. Yoshida and Y. Kamiya  
J. Geomag. Geoelect. 5, 136-140 (December 1953)
15. Geomagnetic and Albedo Studies with a Cerenkov Detector  
at 40° Geomagnetic Latitude  
K. Anderson and J. R. Winckler  
Phys. Rev. 93, 596 (1954)
16. Low Momentum End of the Spectra of Heavy Primary Cosmic Rays  
R. A. Ellis, Jr., M. B. Gottlieb, and J. A. Van Allen  
Phys. Rev. 95, 147-159 (1954)

17. The Inexpensive Attainment of High Altitudes with Balloon-Launched Rockets  
J. A. Van Allen and M. B. Gottlieb  
Rocket Exploration of the Upper Atmosphere, pp. 53-64  
(Pergamon Press, London, 1954)
18. Cosmic Ray Studies with a Cerenkov Detector at  
 $\lambda = 10^\circ$  and  $55^\circ$   
K. Anderson  
Phys. Rev. 96, 829 (1954)
19. Direct Detection of Soft Radiation Above 50 Kilometers in  
the Auroral Zone  
L. H. Meredith, M. B. Gottlieb, and J. A. Van Allen  
Phys. Rev. 97, 201-205 (1955)
20. Reconciliation of Single Counter Data with Vertical  
Intensities Above the Atmosphere  
J. A. Van Allen  
Proceedings of Duke University Cosmic Ray Conference,  
p. III-14, Durham, North Carolina (1954)
21. Energy Balance in the Cosmic Radiation  
J. A. Van Allen  
Proceedings of Duke University Cosmic-Ray Conference,  
p. IV-17, Durham, North Carolina (1954)
22. Measurement of the Cerenkov Radiation from Positive and  
Negative Pi Mesons  
K. Anderson, J. R. Winckler, E. N. Mitchell, and  
L. E. Peterson  
Phys. Rev. 98, 1411 (1955)
23. Cosmic-Ray Intensity Above the Atmosphere at High Latitudes  
L. H. Meredith, J. A. Van Allen, and M. B. Gottlieb  
Phys. Rev. 99, 198-209 (1955)
24. The International Geophysical Year 1957-1958  
S. Chapman  
Nature 175, 55 (1955)
25. Interpretation of Soft Radiation Observed at High  
Altitudes in Northern Latitudes  
J. A. Van Allen  
Phys. Rev. 99, 609 (1955)

26. Direct Detection of Auroral Radiation with Rocket Equipment  
J. A. Van Allen  
Proceedings of National Academy of Sciences 43,  
pp. 57-92 (1957)
27. The Inexpensive Attainment of High Altitudes with  
Balloon-Launched Rockets  
J. A. Van Allen and M. Gottlieb  
Rocket Exploration of the Upper Atmosphere, ed. by  
R. L. P. Boyd, Pergamon Press 1954
28. The Angular Motion of High-Altitude Rockets  
J. A. Van Allen  
Physics and Medicine of Upper Atmosphere, pp. 412-431
29. Determination of the Intensities of Low-Z Components  
of the Primary Cosmic Radiation at  $\lambda = 41^\circ$  Using a  
Cerenkov Detector  
W. Webber and F. McDonald  
Phys. Rev. 100, 1460-1467 (1955)
30. High Altitude Measurements of the Earth's Magnetic Field  
with a Proton Precession Magnetometer  
Laurence J. Cahill, Jr., and J. A. Van Allen  
J. Geophys. Research 61, 547-558 (1956)
31. The Artificial Satellite as a Research Instrument  
J. A. Van Allen  
Scientific American, Vol. 195, pp. 41-47, November 1956
32. Scientific Uses of Earth Satellites  
Edited by J. A. Van Allen  
University of Michigan Press (1956)
33. Cosmic-Ray Intensity at High Altitudes on February 23, 1956  
J. A. Van Allen and C. E. McIlwain  
J. Geophys. Research 61, 567-571 (1956)
34. Effects of a Ring Current on Cosmic Radiation Impact Zones  
E. C. Ray  
Phys. Rev. 104, 1459-1462 (1956)
35. Direct Determination of Primary Cosmic Ray Alpha-Particle  
Energy Spectrum by New Method  
F. B. McDonald  
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## Appendix C

# CEDAR RAPIDS . . . CITY OF opportunities

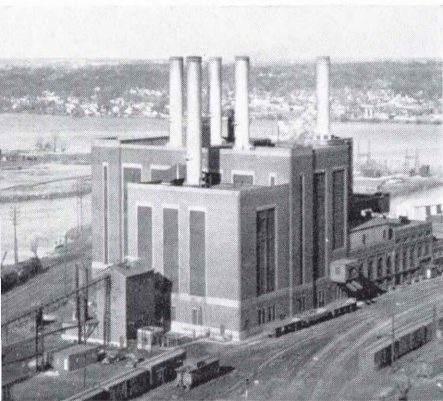
IOWA'S  
INDUSTRIAL  
LEADER



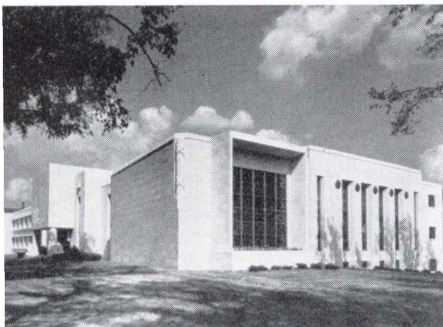
**CEDAR RAPIDS DOWNTOWN AND THE ISLAND** . . . the hub of a civic plan unique among American cities. On a beautifully landscaped island in the Cedar river, stand the city and county public buildings . . . and the home of the Cedar Rapids Chamber of Commerce.



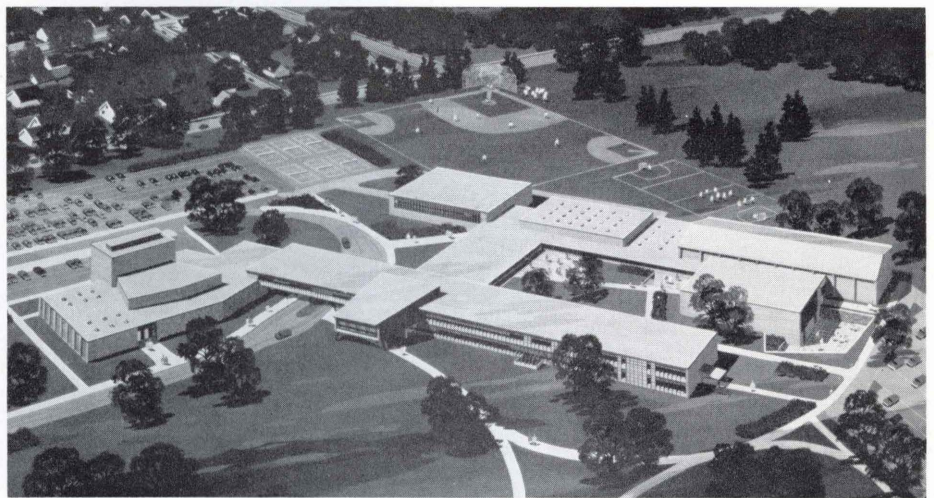
**HOMES . . . AND HAPPINESS.** Just a few minutes' drive from any of Cedar Rapids' busy industrial centers, one finds tree-shaded streets, big yards for children to play in safely. It's a happy atmosphere in which to bring up a family.



**SIXTH STREET STATION . . .** Main power plant of Iowa Electric Light and Power Company of Cedar Rapids.



**NEW MASONIC LIBRARY OF IOWA . . .** One of the most complete in the country.



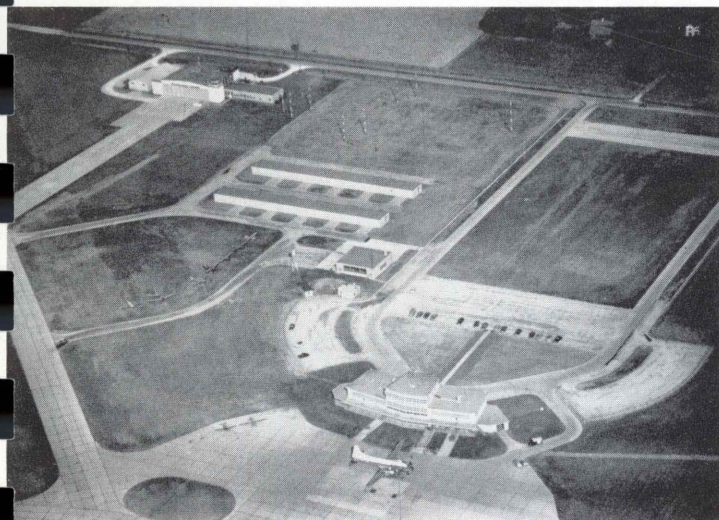
**GEORGE WASHINGTON HIGH SCHOOL . . .** Jefferson High and Regis High School are modern buildings recently completed.

# opportunity 1

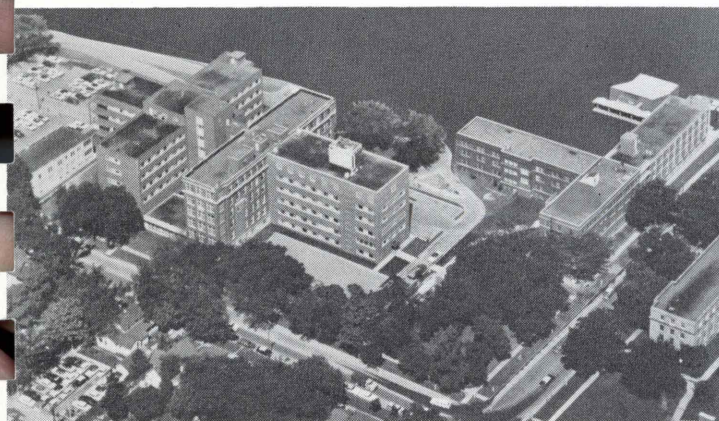
**SURROUNDED BY BEAUTY AND PROGRESS**

# *To Enjoy Life at its Best*

**Cedar Rapids proves that beauty and progress may go hand-in-hand in the modern city's development.**



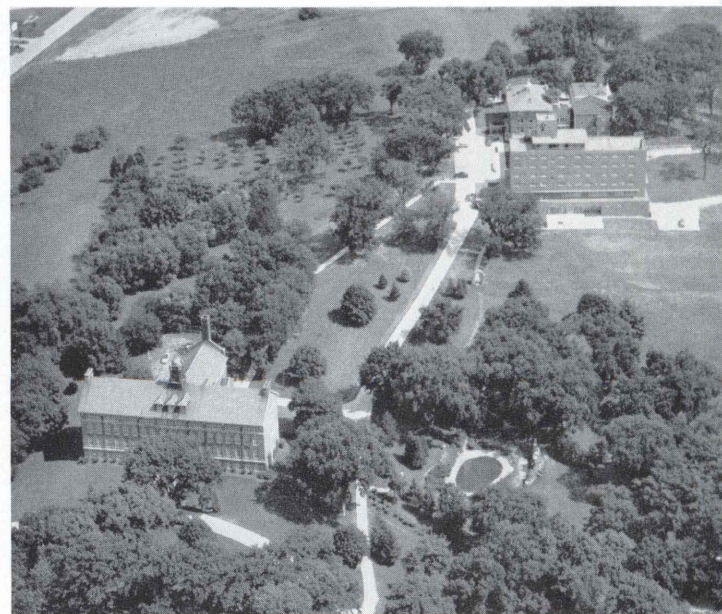
**MUNICIPAL AIRPORT . . .** Scene of many flights taking off and arriving each day.



**ALWAYS** a city of trees and homes, Cedar Rapids has carefully preserved much of the original beauty of those early days . . . adding only the amenities of the new, swifter-paced age.

The result is that workers live within easy reach of their occupations, yet in beautiful and modern settings, with schools, churches, parks, playgrounds and stores easily accessible. Within a few minutes after leaving his job, a man may be home working in his yard or playing ball with his son.

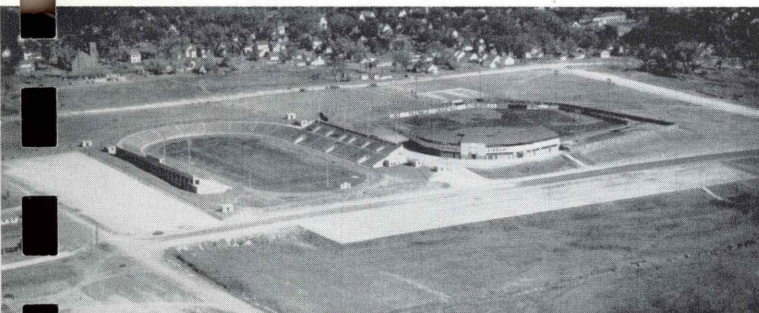
There are many things to enjoy about life in Cedar Rapids . . . and *there is time to enjoy them.*



**MT. MERCY COLLEGE . . .** Coe College, Cornell College and the State University of Iowa contribute to our culture.

**ST. LUKE'S HOSPITAL . . .** (left, above) Along with Mercy Hospital, is completing a Five Million Dollar expansion program.

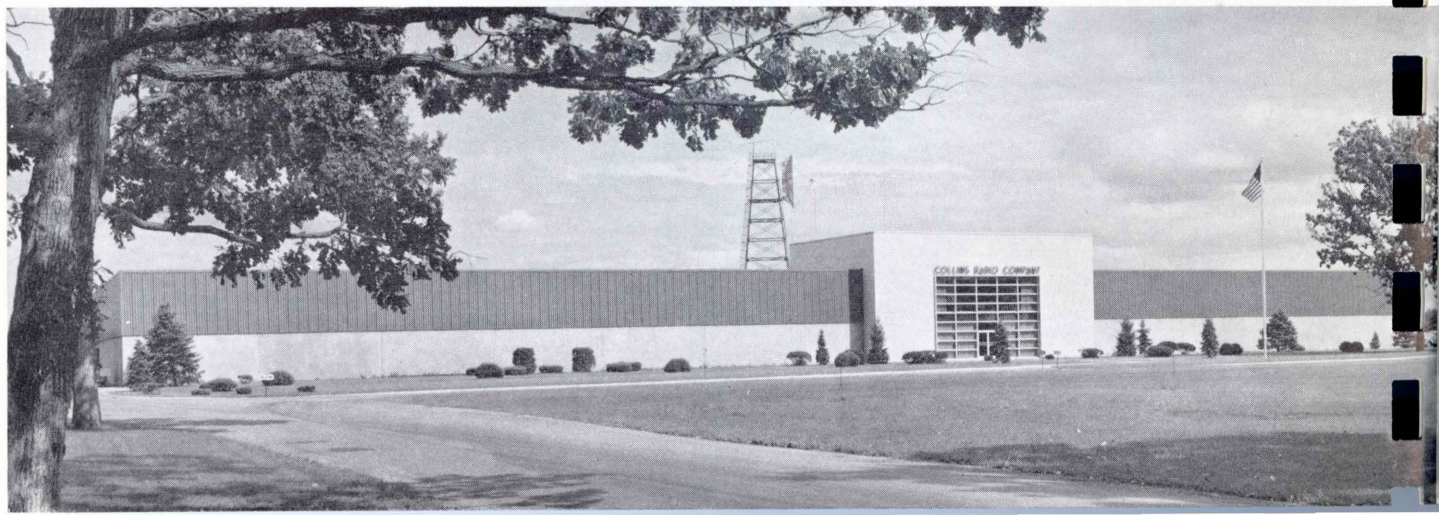
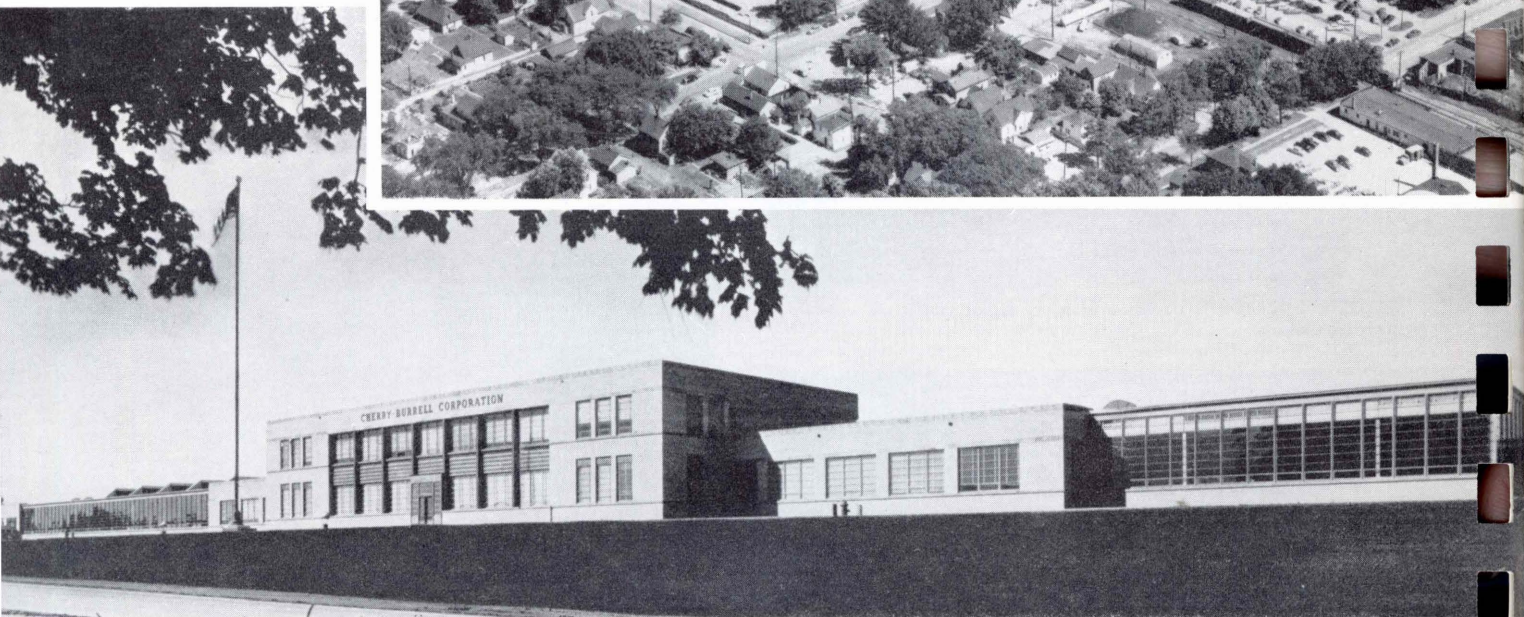
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PENICK & FORD, Ltd., Inc.  
. . . A great corn products  
plant in a state where corn  
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CHERRY-BURRELL CORP. . . .  
The world's most modern  
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COLLINS RADIO CO. . . .  
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opportunity 3 TO GROW WITH THE MIDWEST'S HEALTHIEST

# Marketing Center

Don't be surprised to find "MADE IN CEDAR RAPIDS, IOWA, U.S.A." stamped on a product anywhere in the world! There's a flood of high-quality Cedar Rapids-made goods pouring out into markets everywhere. Two scheduled airlines, railroads, excellent highways . . . all furnish best of transportation. Soon the St. Lawrence Seaway will step up marketing facilities another notch

THE TURNER COMPANY . . .  
Manufacturers of all types of  
microphones.



**D**AY AND NIGHT the big plants which make up Cedar Rapids' heavy industry keep up their busy pace. Out go products of craftsmanship . . . sent proudly to markets throughout the nation and the world. Today, exports reach a total annual volume of over \$29,000,000 for principal manufactured goods . . . cereals, corn products, milk processing machinery, meat packing, farm hardware, grain milling, poultry and stock feeds . . . all of them products to help feed a hungry world.

Add road-building and mining machinery, truck parts, earth-moving equipment, radio transmitters and receivers, steel fabricating, casting of ferrous and non-ferrous metals, pharmaceuticals . . . and you have a picture of the products of Cedar Rapids . . . the Midwest's healthiest marketing center.

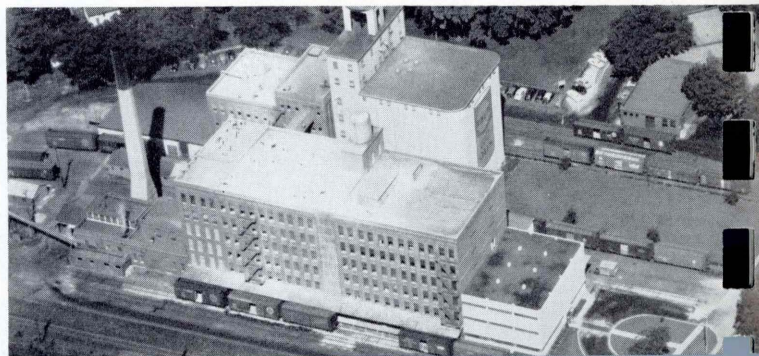
SOUVENIR LEAD PENCIL CO. . . .  
Makers of advertising novelties.



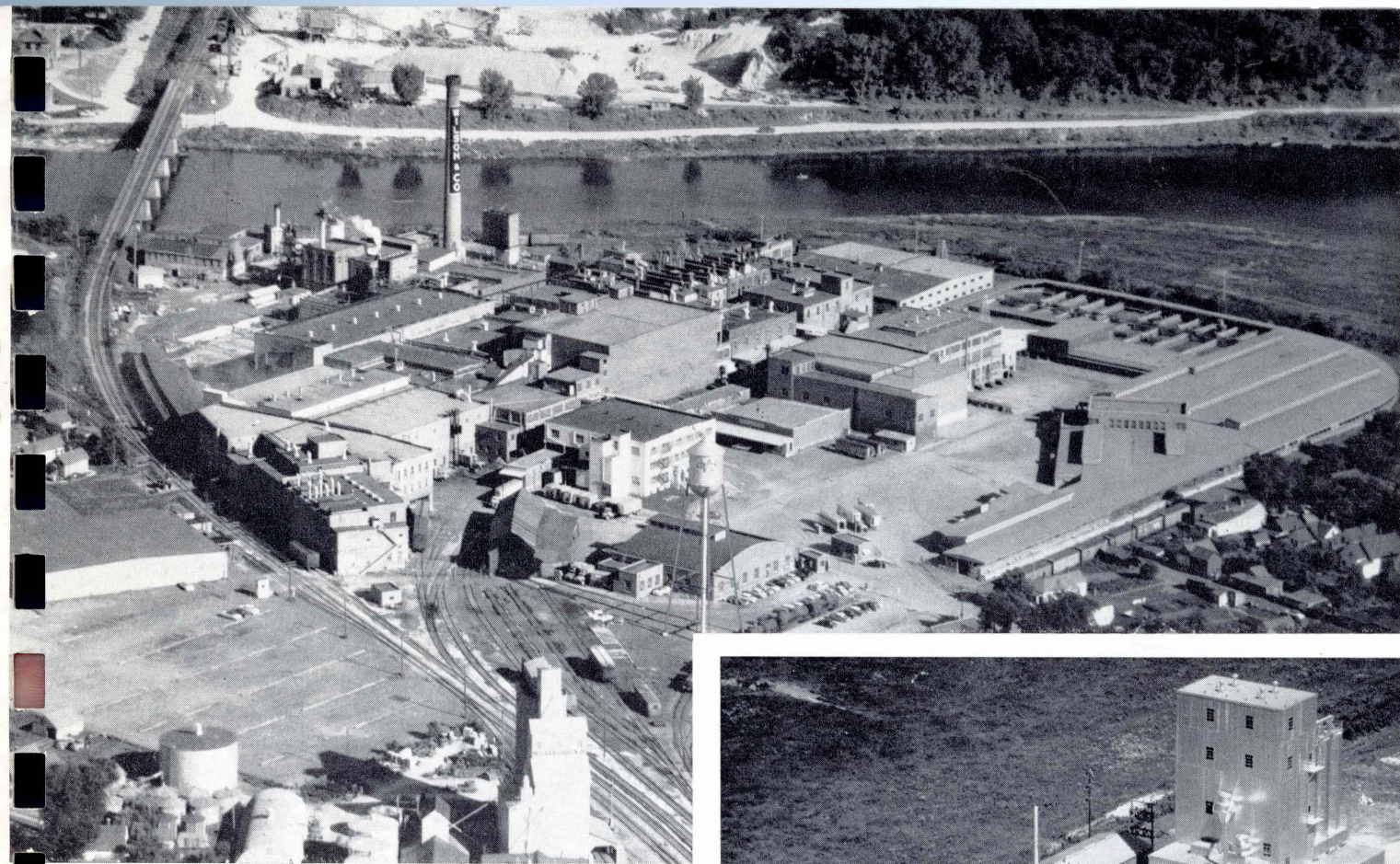
LE FEBURE . . . Manu-  
facturers of bookkeep-  
ing systems, bank and  
office equipment.

SANITARY FARM  
DAIRIES . . . Large  
retail dairy foods dis-  
tributors.

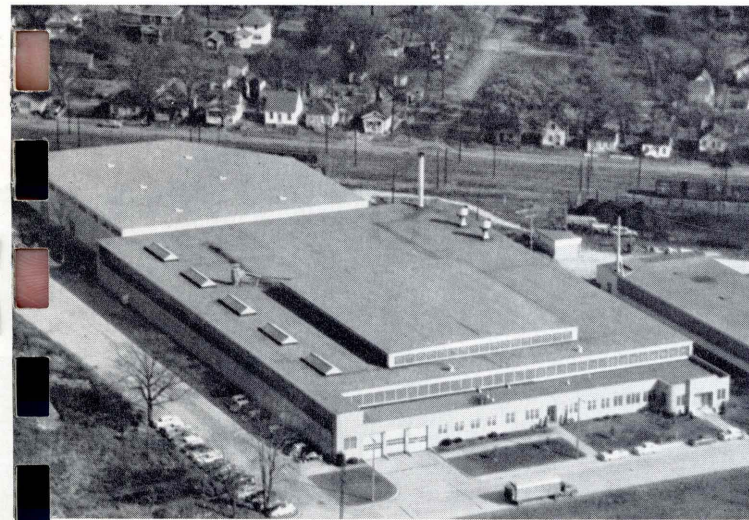
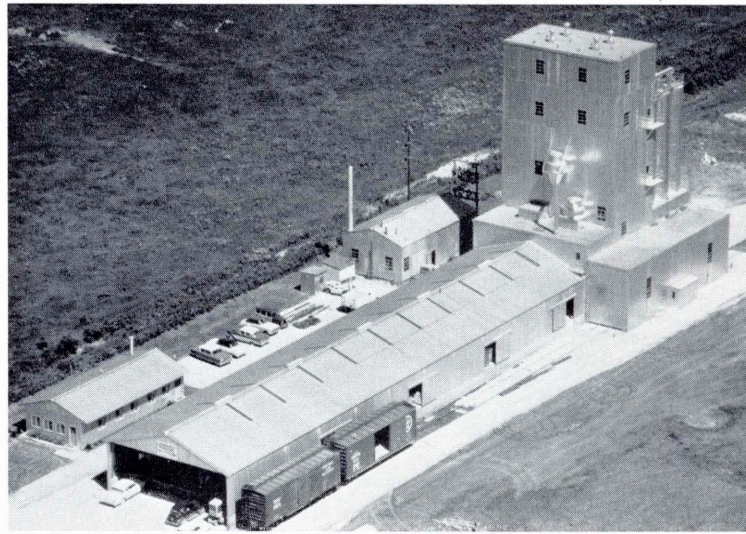
NATIONAL OATS  
COMPANY . . . Larg-  
est producer of pop-  
corn in the United  
States.







WILSON & CO. . . . Respected leader in meat-packing industry.



WEYERHAEUSER CO., SHIPPING CONTAINER DIV. . . . Makers of corrugated packing material and paper products.

HUBBARD MILLING CO. . . . (right, above) Grain processing plant . . . in agricultural heartland of Midwest.

BARNARD & LEAS MFG. CO., Inc. . . . Manufacturers of transport trailers for an ever-growing market.



# opportunity 4 TO BE LOCATED IN THE *Heart of America*

**Iowa is near the geographic center of the U.S. . . . in the heart of the greatest food-producing area in the world. Today, Iowa has 25 per cent of all the Grade A land in the U.S. And more than 70 per cent of Iowa's farmland is Grade A! It is, and probably always will be, one of the very richest agricultural areas in the world.**



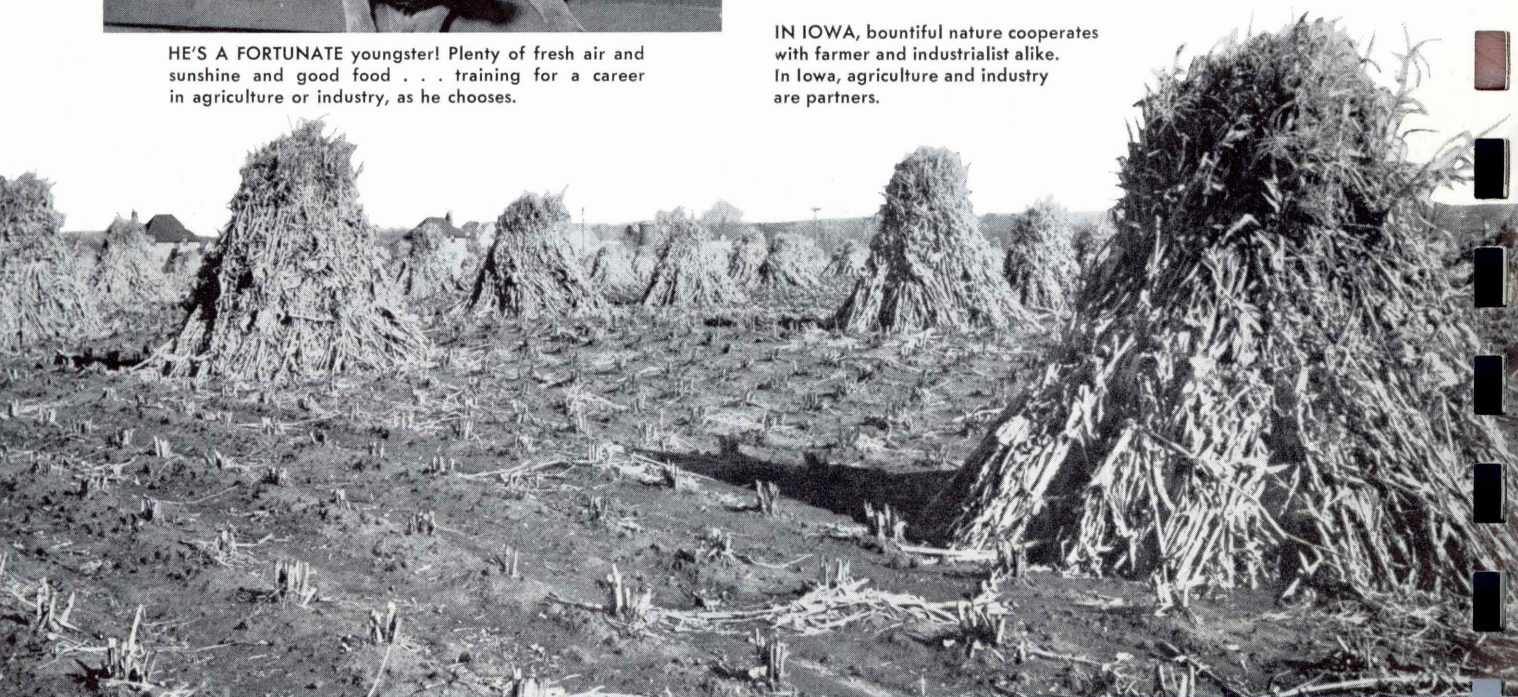
**HE'S A FORTUNATE youngster!** Plenty of fresh air and sunshine and good food . . . training for a career in agriculture or industry, as he chooses.

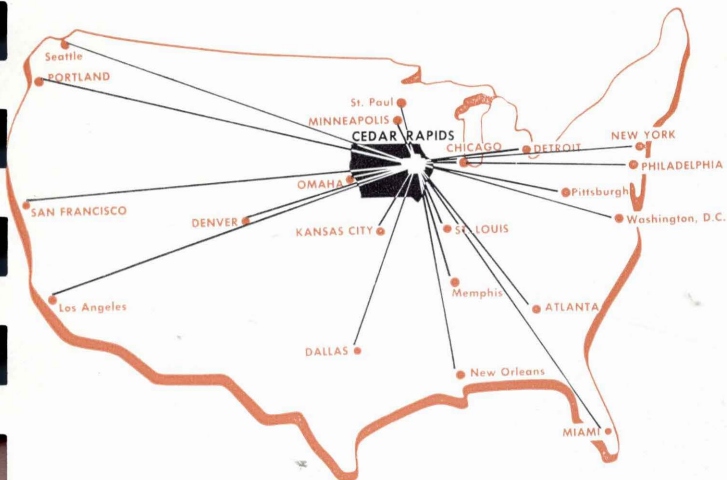
**N**O OTHER STATE is so evenly divided between agriculture and industry as Iowa. Iowa's rich black soil is the natural heritage of the industrial worker as well as his fellow worker on the farm. It is a storehouse of raw materials for industry.

The industrial worker is never more than a few minutes' drive away from green fields and ripening crops. It is good for him and his children that this is so. It is good for busy industrial cities such as Cedar Rapids to have this close bond between agriculture and industry.

Profitable markets are nearby . . . an intelligent, stable labor force is always available. Iowans grow up learning to use tools. On highly mechanized farms, youngsters learn early how to handle tools skillfully. In town, many Iowans operate their own small plants. Iowans have mechanical know-how. And there is always plenty of power for their needs

**IN IOWA, bountiful nature cooperates with farmer and industrialist alike. In Iowa, agriculture and industry are partners.**



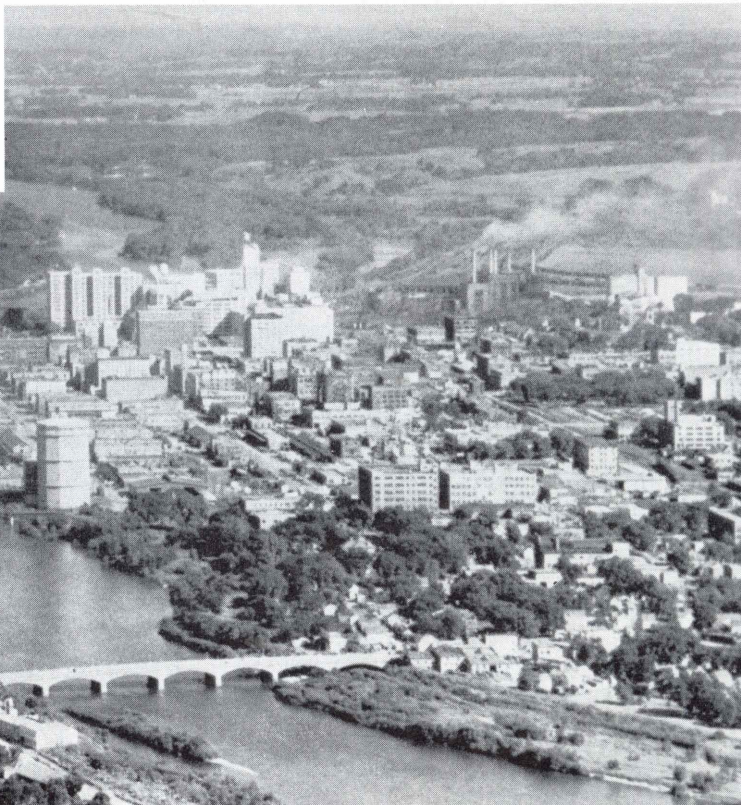


NOTICE THE LOCATION of Iowa . . . near the geographic center of the U.S., and notice the convenient location of Cedar Rapids . . . ideally situated in regard to the great markets of America.

IOWA FARMERS are among the finest raisers of high grade stock in the world. Iowa sends 19 million hogs to market annually, while at the same time running a close second in beef production.

IOWA IS STILL the nation's richest source of agricultural products. Its total production of combined grain crops leads all competitors. It provides one-tenth of the world's corn supply.

WITH ALL ITS PRIDE of industry, Cedar Rapids has another source of pride . . . that it has preserved the natural beauty of river, trees and open spaces for the enjoyment of its people.



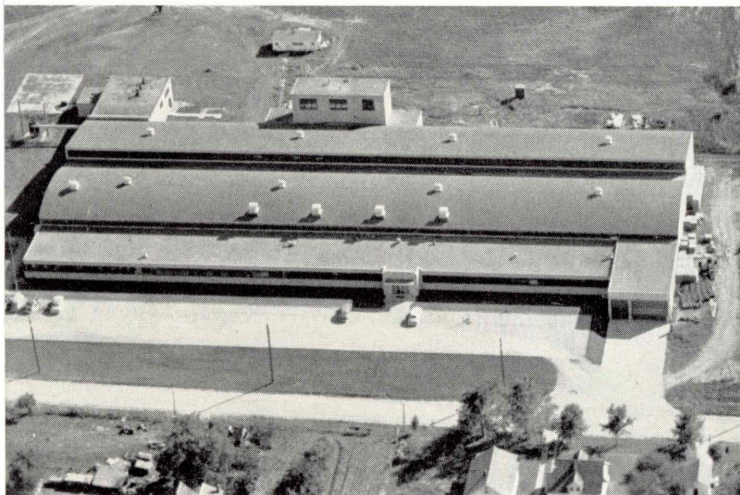


**T**OWERING INDUSTRIAL PLANTS and wide-flung manufacturing operations are the natural outcome of the many special advantages offered by Cedar Rapids

Along with its ideal location, business and industry finds abundant transportation by rail, truck and air. It shares with other Iowa cities the advantages accruing from the fact that millions of tons of freight are shipped annually on the two great rivers which border the state.

And... an important fact... industry can always depend on plenty of power. Careful planning ahead for anticipated needs takes care of future requirements. Iowa workers are mechanically apt, handy with tools, quick to learn the best way of doing things. And since 95% of Iowa's population is native-born, there is a kinship of feeling that makes for working harmony.

W. R. GRACE & CO. Cryovac Division . . . Leader in the field of plastic packaging.



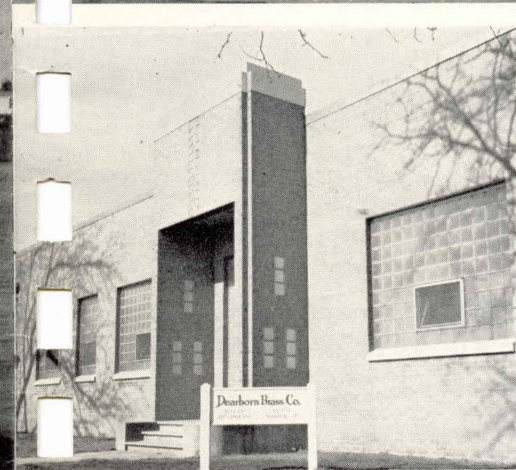
QUAKER OATS PLANT . . . world's largest cereal mill . . . located near site of first small Cedar Rapids mill.

DOWNING BOX COMPANY . . . a new Cedar Rapids industry which fabricates corrugated boxes.





**CEDAR RAPIDS AIRPORT**  
 . . . one of the busiest in the Midwest. United Air Lines and Ozark Air Lines furnish complete service.



**DEARBORN BRASS CO.**  
 . . . manufacturers of brass products. Another example of diversification in Cedar Rapids.



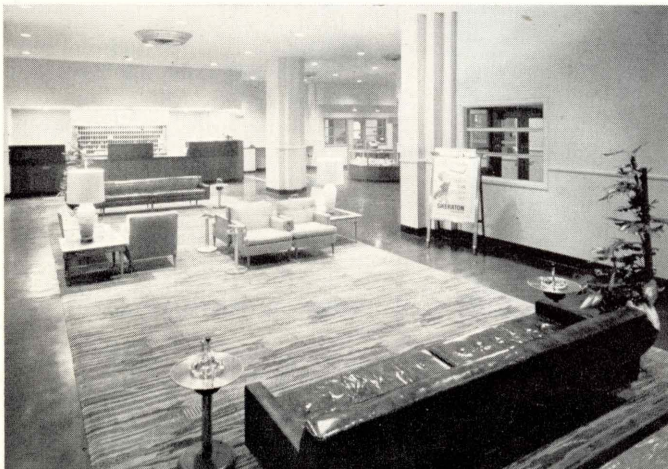
**MOTEL** . . . typical of the many fine motels serving travelers' needs in the Cedar Rapids area.

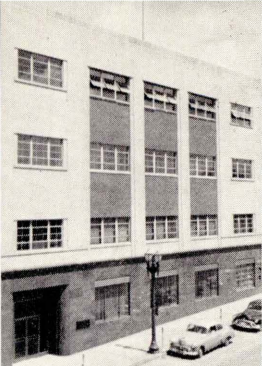
**SHERATON - MONTROSE HOTEL** . . . newly remodeled to offer service of the sort for which this chain is famous.

**I**T'S EASY for folks to come and go in Cedar Rapids. There is much traveling done by residents and they are hospitably glad to welcome friends and relatives. Standing at the crossroads in the heart of the U. S. A., Cedar Rapids is easy to visit, easy to get around in. Those are reasons for its importance industrially.

Excellent transportation, good hotels, motels and eating places, a fine shopping district . . . all these help make Cedar Rapids a splendid business center, a good place to hold conventions, a good city to visit. You're always welcome in Cedar Rapids.

**ROOSEVELT HOTEL** . . . recently remodeled to accommodate small or large gatherings. These two hotels spent \$1.5 million for their renovation programs.

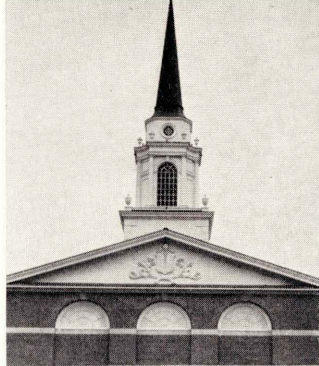




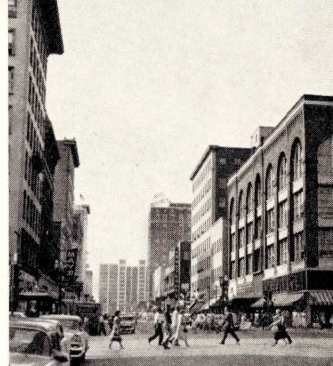
IOWA MUTUAL INSURANCE COMPANY



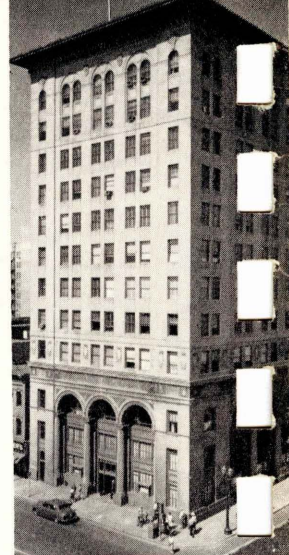
COLISEUM . . . housing City Administration



COE COLLEGE . . . founded in 1851



LOOKING NORTH on busy Second Street in downtown Cedar Rapids.



THE MERCHANTS NATIONAL BANK . . . Deposits of national and four state banks totaled \$183,010,906.77 Jan. 1, 1963.

## OTHER FACTS AND FIGURES THAT SHOW HOW *opportunity keeps on knocking on the business doors of Cedar Rapids*

ASSESSED VALUATION . . . For the year 1962, \$183,608,664 after exemptions.

AUTOMOBILES . . . Passenger cars in 1962, 58,950; trucks, 8,334 (Linn County).

BIRTH RATE . . . 3,835 in 1962.

BONDED INDEBTEDNESS . . . as of January 1, 1963, \$13,828,000.

BUILDING ACTIVITIES . . . number of permits in 1962: 3,431; value, \$16,885,466.

COMMUNICATIONS . . . four radio stations, two TV stations, one daily newspaper.

DEATH RATE . . . 1,036 in 1962.

DWELLING UNITS . . . 1960 Census 29,538. 1962 Homestead Tax Credit applications, 21,352.

ELECTRIC CONSUMERS . . . 33,965 customers in 1962.

GAS CONSUMERS . . . 34,860 meters in service in 1962.

GOLF . . . two 18-hole private, two 18-hole and one 9-hole public courses.

GOVERNMENT . . . Commission form: mayor and 4 commissioners.

HIGHWAYS . . . U.S. 30, 151 & 218; Iowa 64, 74, 149, 150, 84 and 13.

HOSPITALS . . . Mercy, 300 beds; St. Luke's, 425 beds.

### IOWA STANDS FIRST —

in value of farms  
in value of livestock  
in value of hogs  
in eggs produced  
in horses  
in corn  
in oats  
in percentage of improved farmland

MUSIC . . . Beethoven Music Club; Music Department of Women's Club; Mozart Study Club; Coe College Band; Cedar Rapids Symphony Orchestra; SPEBSQSA; Cedar Rapids Municipal Band; Drum and Bugle Corps; and public school music groups are recognized nationally.

POPULATION . . . 1960 Census: Cedar Rapids, 92,035; Linn County,

136,899. Census figures reveal Cedar Rapids is Iowa's fastest growing city. POST OFFICE RECEIPTS . . . 1962, \$2,727,828.

PUBLIC SAFETY . . . Police Department of 131 men maintains 31 pieces of motor equipment. Fire Department of 130 men, 8 fire stations. Has lowest rate for fire insurance. RAINFALL . . . normal annual rainfall, 32 inches.

RECREATION . . . Joint city and school district recreation area covers 58 acres; facilities include Memorial Baseball Stadium, Kingston Stadium (football, tennis, etc.) . . . 33 parks covering over 1,300 acres.

RETAIL SALES . . . \$199,413,291 for year ending June 30, 1962 . . . second highest among all Iowa cities.

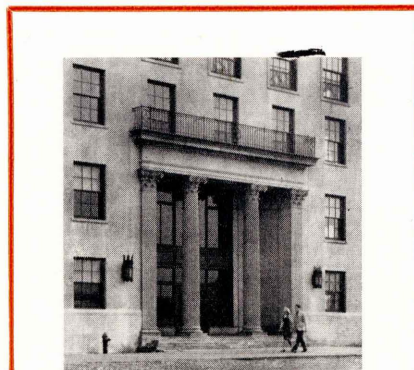
SERVICE CLUBS . . . Rotary, Exchange, Kiwanis, Lions, Conopus, High-Twelve, Optimists, Quota, B.&P.W., Altrusa.

STREETS . . . 500 miles of streets of which 393 miles are hard surfaced.

TAX RATE . . . Real estate and personal property tax on 60% of value at rate of 98.379 mills on 1962 assessed valuation.

TEMPERATURE . . . Normal annual mean temperature 48 degrees F.

A friendly Chamber of Commerce, located in its own building . . .



. . . furnishes a complete business service to the entire community.

## Cedar Rapids Chamber of Commerce

CEDAR RAPIDS, IOWA

STATE LIBRARY OF IOWA



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