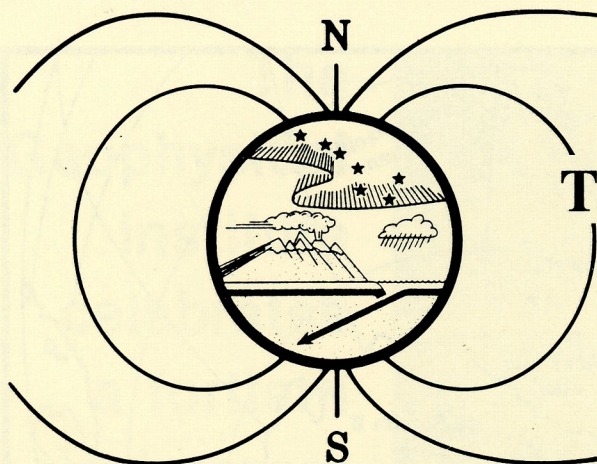




The Geophysical Institute QUARTERLY

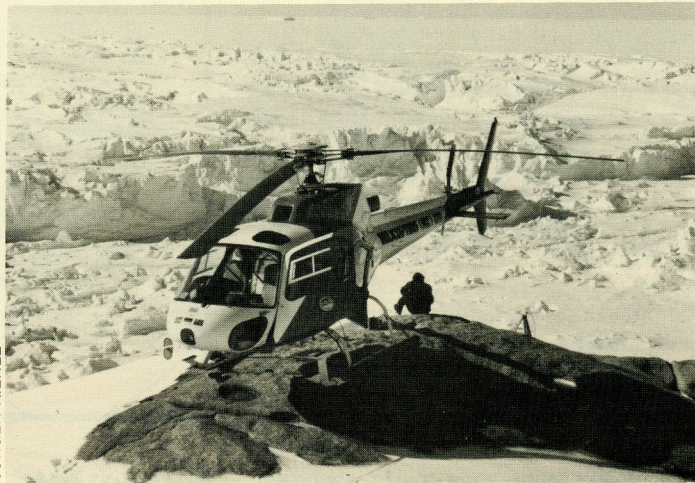
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University of Alaska Fairbanks

Spring 1989



Well-dressed local residents welcome the Norwegian ice breaker Polar Queen to the site of Gondwana Station, Antarctica in December.



JURGEN KIENLE

During the Antarctic expedition, finding the necessary bedrock on which to set up equipment challenged institute scientists and helicopter pilots as well.

Alaskan scientists trek to Antarctica

While the Arctic is the arena for many institute studies, Antarctica also attracts our scientists, who travel there to explore its mysteries and learn from both the similarities and differences of the earth's opposite pole. Here we report recent field work in solid earth geophysics and glaciology. Another institute scientist was in Antarctica last winter to work on less earthly questions. In the summer *Quarterly* we'll look at the upper atmosphere research that took Roger Smith of the aeronomy group to South Pole Station.

Matters of gravity

Juergen Kienle and graduate student Tim Redfield traded winter in Alaska for summer in Antarctica this year for an expedition studying the geology and geophysics of a little-known part of the south polar continent. Kienle is a professor of geophysics at the institute.

From November 20 through March 14, the two participated in GANOVEX V, the fifth German Antarctic Northern Victoria Land Expedition. The project's aim was

to map the geology of parts of the Transantarctic Mountains. Kienle and Redfield carried out a gravity survey, a technique that reveals crustal structure beneath the visible geology.

"It's really terra incognita geophysically," Kienle said. "Ours was the first well-controlled gravity study done in the area." Gravity studies provide a fundamental measurement necessary for understanding the earth's crust.

Expeditionary efforts began in New Zealand, where the research team participated in a one-week cram course in mountaineering held near Mt. Cook. Then, embarking December 1 on the Norwegian icebreaker *Polar Queen*, expedition members left Wellington for the voyage through the Roaring Forties, the windy southern seas below 40° south latitude.

"Mostly the weather wasn't too bad on the trip down," said Kienle—fortunately for him, since he celebrated his 50th birthday on the trip. "They gave me a big three-layer birthday cake," he said, "so it would have been terrible to be seasick

for that." Three days later, they were in a whiteout with 20-knot winds.

Landed at Terra Nova Bay on December 12, their first job was to unload the ship. That entailed moving not only scientific supplies and their own gear, but also aircraft fuel and building materials for a new base camp, Gondwana Station. (The scientists lived in tents while a construction crew assembled the permanent buildings for Gondwana; by the time the buildings were habitable, the scientists and their tents were moving to a new location.)

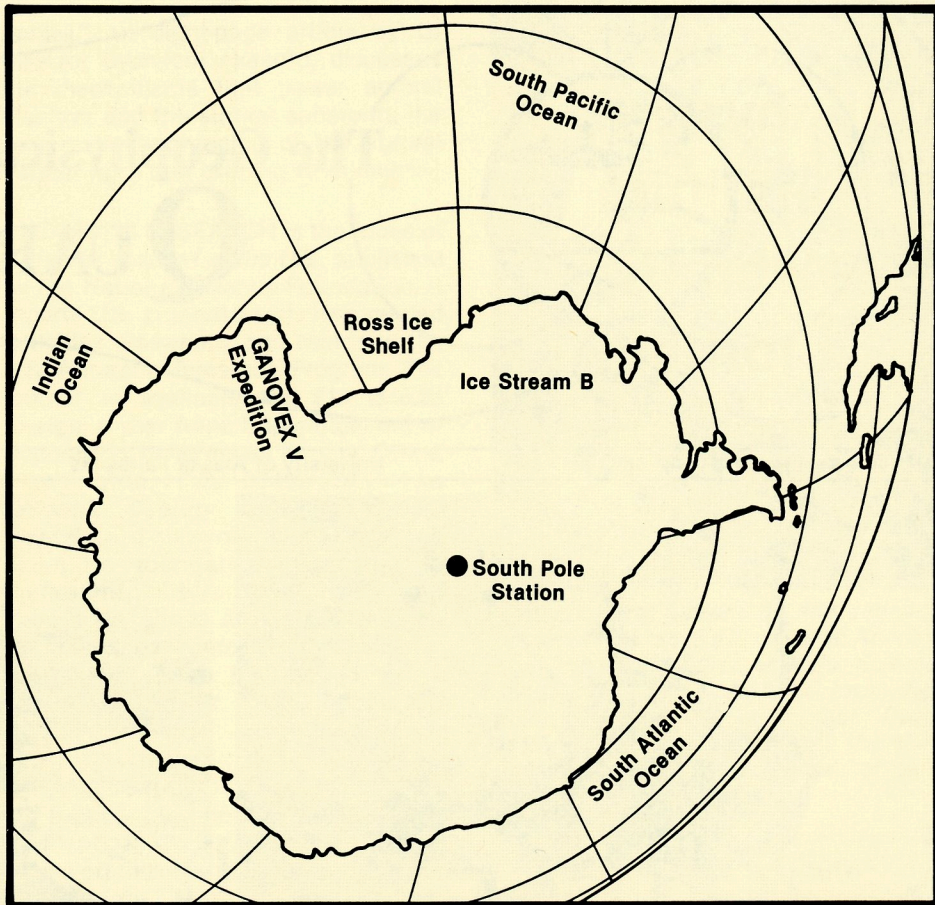
Despite the training in mountain climbing, Kienle and Redfield worked mostly in helicopters, logging about 120 hours

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During the 1988-89 season, five institute scientists worked in three areas of Antarctica: the South Pole, Ice Stream B, and in the Campbell Block of the Transantarctic Mountains, west of the Ross Ice Shelf.



GEOPHYSICAL INSTITUTE

Antarctic research

continued from 1

of field flight time. On flight days, Kienle was responsible for operating the gravimeter while Redfield operated the satellite receiver; exact station locations were obtained by crosschecks with a minimum of four global-positioning satellites visible to the receiver at once. Because of the satellite system, and because all stations were located on bedrock, the data gathered is the most accurate and reliable ever obtained for the Campbell Block of the Transantarctic Mountains, from the Ross Sea coast to the polar plateau, and for the area encompassing the Rennick Glacier-Wilson Hills-Oates Coast region.

"That second leg of the expedition was probably the most exciting," Kienle said. "There aren't even topographic maps for parts of the area. The weather got pretty wild—one party recorded winds of 85 to 90 knots, though where we were it only got to 60. It was surprising that the tents held up, but they did." During better weather, the team made an incidental contribution to knowledge of the area: by flying careful grid patterns, they established that the Terra Nova Islands, reported in 1958, did not exist.

"That early report might have been based on dirty overturned icebergs or something else—we just don't know," Kienle said. "But whatever they were, they aren't there now."

Kienle and Redfield left the Kavrayskiy Hills, the base for their work in the expedition's second leg, before the end of February. Transported back to Gondwana Station aboard the *Polar Queen*, they were rejoined by the construction crew and sailed off for New Zealand—"into the teeth of howling gales," as Kienle's journal notes. The vessel encountered 60-knot winds and 12-meter seas during its return to Wellington, where it arrived on March 14.

The two will work on the data they gathered, integrating it with the results of other GANOVEX V studies, over the coming year. For Redfield, the work has special significance: the data gathered in Antarctica will be the basis for his thesis, a major part of the effort needed to obtain his master's degree in geophysics.

Exploring Antarctica's ice stream B

People living in Homer, Meyers Chuck, and even Anchorage have good reason to be interested in the work done this past winter by institute scientists on the West Antarctic ice sheet. For that matter, so do people living in any low-lying area close to the sea.

"What we've been looking at is the stability of West Antarctic ice sheet," said Will Harrison, professor of physics and an institute glaciologist. Harrison and Keith Echelmeyer, assistant professor of geophysics, worked for two months (November-January) as part of a multi-institutional team studying the Siple Coast area from several camps supplied by LC-130 Hercules and Twin Otter aircraft.

"Perhaps a third of the Antarctic Ice Sheet is anchored below sea level. If there is a sea level rise associated with climate warming, this ice is potentially unstable," said Harrison. Should the ice break up, it could displace so much water that global sea level would rise somewhere between five and eight meters (16 and 26 feet).

An ice sheet, or continental glacier, is a large, continuous cover of ice and snow over a land surface. Spreading outward in all directions, it is not confined by the underlying topography. Today ice sheets exist only in the polar regions, but

during the Ice Age they covered large parts of North America and northern Europe. Within the ice sheet are currents of ice that flow more rapidly than surrounding ice. These ice streams usually flow to an ocean or an ice shelf and may be active or dormant. An ice shelf is attached to land, but floats on the sea and generates icebergs.

During this two-year project, researchers are examining the interaction among the West Antarctic Ice Sheet, the large ice streams embedded in it, and the Ross Ice Shelf.

"Nobody understands the ice stream phenomenon very well," Harrison said. "By looking at topography and crevasses, you can tell they're entities and they're fast flowing. Ice stream B, where we worked, is moving at about one meter a day." The seaward motion of the entire ice sheet from the polar plateau is about 10 meters a year. Harrison and Echelmeyer are searching for variations in the speed of ice stream B.

Echelmeyer is something of an ice-stream specialist, having worked for several years on Jacobshavns Glacier in Greenland. Like the antarctic ice stream, the Jacobshavns Glacier forms a distinct and comparatively swiftly moving ice river within a slower ice sheet. "The work

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The Geophysical Institute celebrates a fortieth anniversary

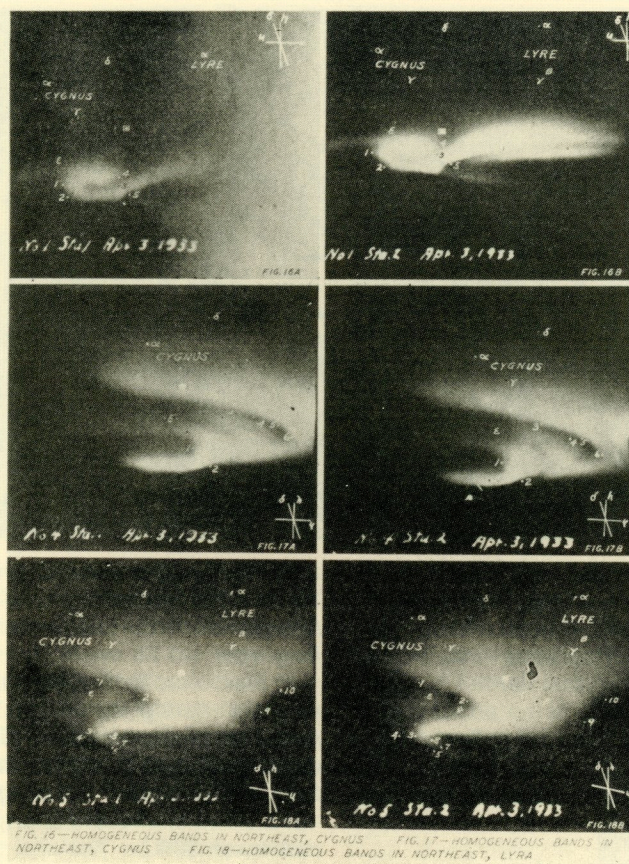
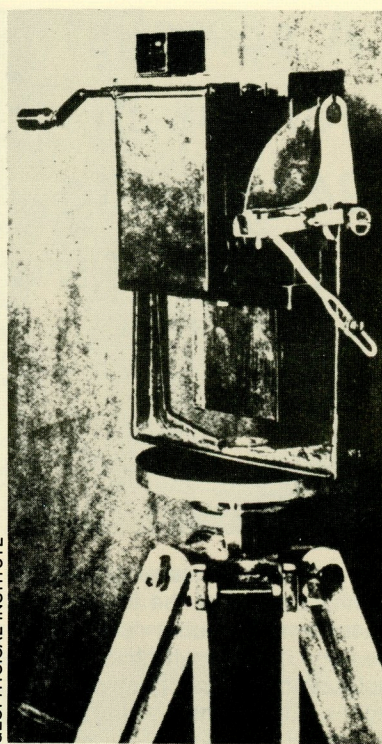


FIG. 16—HOMOGENEOUS BANDS IN NORTHEAST, CYGNUS
FIG. 17—HOMOGENEOUS BANDS IN NORTHEAST, CYGNUS
FIG. 18—HOMOGENEOUS BANDS IN NORTHEAST, LYRE

GEOPHYSICAL INSTITUTE



The first auroral studies (1930-1934) used a special camera (above) that could take six photos in rapid succession by simple movement of the lens. In the 1934 campus photo below, the Eielson Building, then one story, is at front left.

UAF ALASKA & POLAR REGIONS DEPT.

This year the Geophysical Institute marks its 40th anniversary as a permanent research facility and the 60th anniversary of the first geophysics research at the Alaska College of Agriculture and School of Mines (later renamed the University of Alaska). Here we review the early years of research, from 1929 to 1950. In our summer issue, we'll examine how the institute developed during the 1950s and 1960s.

— The Early Years —

During the thirties and forties, research at what would become the Geophysical Institute was conducted at the Eielson Building on campus and a few field sites. Although the UA Board of Regents passed a resolution endorsing an arctic research institute in 1936, efforts to fund the proposal failed. More than a decade later, the Geophysical Institute was formally established at the university on July 1, 1949.

These early years were reviewed in 1950 by the institute's first director, Dr. Stuart Seaton, in "Report of the Director for the Period Ending December 31, 1949."

....Founding of the Institute was a consequence of the gradual growth of research in arctic geophysics at the University from a modest beginning in 1929, when a grant from the Rockefeller Foundation permitted auroral height measurements to be undertaken. During the International Polar Year programs of 1932-1933, the University of Alaska was designated a first order station in the network of stations engaged in seismological, earth- and atmospheric-electric potential, terrestrial magnetic, auroral, and ionospheric measurements.

From 1934 through 1941 a portion of the Polar Year program was continued with the assistance of the Coast and Geodetic Survey, Navy Department, Signal Corps, Carnegie Institution of Washington, and others. The earlier work, and research during the interval 1934-1941, took the form of isolated studies and small



specialized investigations. The Polar Year programs...were extensive and well coordinated with other agencies outside the University.

In 1941 the Carnegie Institution of Washington [Department of Terrestrial Magnetism] asked cooperation of the University of Alaska in undertaking a vigorous attack on problems in arctic geophysics with especial emphasis upon the ionosphere, the terrestrial magnetic field, high frequency long distance radio wave propagation, and zenith auroral activity. This program was commenced in April, 1941, by means of the most modern and powerful tools available.

In December 1941, the United States entered World War II. An immediate consequence of this action was a strengthening of interest in arctic geophysical research. The program...was enlarged by studies concerned with deviation of radio waves

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A scientist relates his 1949 visit to Fairbanks



The university observatory and its setting were described by Daniel Barbier of the Institut d'Astrophysique, Paris, after he spent several months visiting here in 1949. Barbier and his companions brought with them three spectrographs described as splendid by Director Seaton, who reported that Barbier "expressed his astonishment at the extreme clarity of our atmosphere."

Barbier's account of his visit appeared in *Ciel et Terre Review* (LXVth year, No. 10, Oct. 1949). In 1950 Albert Belon of the Geophysical Institute translated the article, and an abridged version is reprinted here.

A Polar Geophysical Observatory Fairbanks (Alaska)

You take the plane in the Northwestern part of the United States; the steward advises you, "When we land in Alaska, do not touch the metal with your bare hands when you go out the plane; your skin may stick to the metal and be torn." Ten hours later, you land in Fairbanks, in the heart of Alaska.

You are now a "Cheechako" and nothing else. Among other Cheechakos in Alaska (for several months or even several years, because one remains a Cheechako for a very long time)...you will have to revise your ideas (which go back to the Gold Rush or the novels of Jack London) about this territory. The inhabitants themselves like to call (it) "the last frontier" or "the top of the world."

In the heroic past, the dogsled was the only means of conveyance in the interior of the country. The journeys sometimes took several weeks. The dogsled has certainly not disappeared; its use is still justified for small distances in desolate regions, but for long journeys, the airplane has taken its place. Alaska...now has the greatest number of airplanes and airports per inhabitant.

Fairbanks is the ideal center to serve Alaska. Besides its plane connections, this town is joined to coastal Anchorage (the Chicago of Alaska) by a railroad and a highway (open only in the summer). It is also joined to the USA by a strategic highway built during the last war and always open.... The customs are the same as in the USA, cooking is sometimes Mexican (tamales, chili con carne); we find there also Coca Cola, dear to the hearts of Americans.

If in the street the inhabitants look like Eskimos, as soon as they are in a house and take off parkas and mukluks, they appear dressed like the inhabitants of the temperate regions. The heating of houses is absolutely terrible; to stand it, this author had to keep his window partially open all the time, even with an outside temperature of -40°C.

The country? Here again, preconceived ideas must give way to reality. It is true that the coast of the Arctic Ocean is quite polar and wild, but the landscapes of the central regions, with

their coniferous forests, remind one of the landscapes of Western Europe but at a lower altitude. Agriculture and livestock raising flourish; wheat was cultivated near Fairbanks not very long ago.

In Fairbanks the temperature is an important subject of conversation during the winter. They say it is cold when the thermometer drops below -25°C. It is exceptionally cold when it drops below -50°C. One can stand this cold easily enough because of proper clothing and the complete absence of wind.... The summer is short, but often warm, the temperature can reach 30°C.

Fairbanks has two military airports and a civil one, two broadcasting stations, one of which has a power of "50 kw" (sic). It is an important mining center and a prospecting center for the oil fields of the extreme north.... Fairbanks has a university. It is the largest town of the center of Alaska. Its population is only 7,000 inhabitants.

University of Alaska

At five kilometers from Fairbanks, we reach by bus a small community called College. It is the seat of the University of Alaska. In 1915 the U.S. Congress created a School of Mines in Fairbanks. The cornerstone was laid on the 4th of July; two years later they created a School of Agriculture. Then the two establishments took the name of Agricultural College and School of Mines of Alaska. In 1921 Dr. Charles E. Bunnell was elected president of the college and it opened in 1922.

Dr. Bunnell, who just retired, was a great administrator. He did not spare his efforts to develop the institution he directed, and in 1935 he obtained from the Alaska Parliament its transformation into a university. Since then, the University of Alaska has not ceased to grow larger.

Studies last for four to five years according to the major subject (Arts and Letters, Science, Agriculture, Business Administration, Mining, Engineering). They give only the bachelor's degree....

The number of students registered is 350; some are Alaskans, but others, anxious to know a more adventurous life, come from the USA. Several hundred short courses are offered to them by the university catalogue. Some would seem strange for our students; what would they think to attend a course about: "Cooking in camps. For men only. Preparation of nutritive meals with the foods found in the camps. Field trips; attention will be focused on the constitution of stock of camp provisions."

The most developed subjects are obviously those that have a direct relationship with Alaska: agriculture and peculiarities due to the climate, mining and particularly gold mining, anthropology. At present, the Geophysics teaching program is not very large.



GEOPHYSICAL INSTITUTE



The life of the university is very active. The students have two papers, "Polar Star" and "Farthest North Collegian." They founded a very great number of associations.... The sports are a great part of the college life; (ice hockey is) above all the sports of competition...skiing is practiced less than it should be.

The University of Alaska has also an important cultural influence on the whole population. A very successful initiative is "University Day." On this day every door of the university is opened to the public. Expositions describe the various aspects of its activity; scientific experiments are organized either with demonstrations, apparatus of the courses, or with specially prepared displays. The people crowd in the classrooms and by their attention and their interest, reward the organizers...teachers and students.

Geophysical Observatory

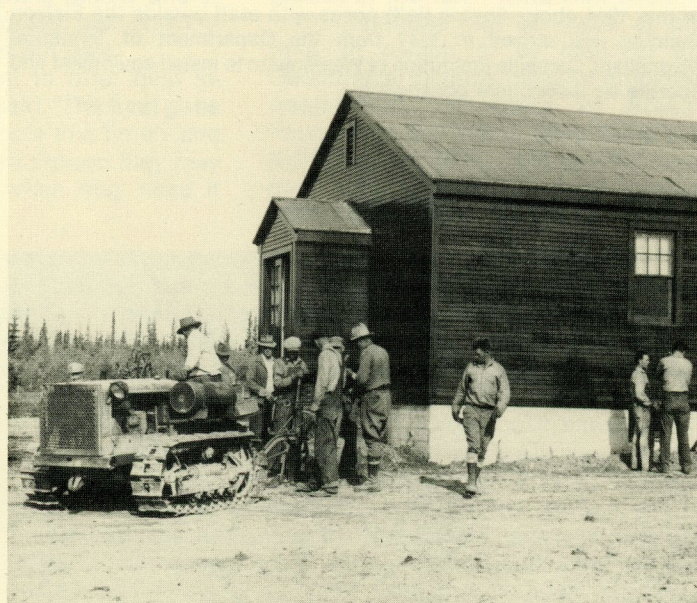
Until 1941, the geophysical research was not carried on at the University of Alaska. However, from 1930 to 1934, a beautiful series of observations of aurorae, with determination of height by the method of Carl Stormer, was carried on by Veryl B. Fuller and Ervin H. Bramhall.

At the beginning of 1941, collaborating with the University of Alaska, the Carnegie Institution of Washington undertook a series of studies about the geophysical problems of the Arctic and particularly, about the propagation of radioelectric waves and the ionosphere. In 1946 it became obvious that geophysical research in Alaska had to be established on a stronger base, and the Geophysical Observatory of College was officially created. Dr. S. L. Seaton, well known for his ionospheric research carried on in various parts of the world, was appointed director of the observatory.

Research has already been done or is being done on many subjects: continuous registration of the intensity of several radioelectric stations for the study of the propagation of the waves; investigation with variable frequency of the ionosphere; study of the magnetic field and its fluctuations, including fast fluctuations registered with flux meters; registration of the auroral intensity; measurements of the ozone.

The personnel of the Geophysical Observatory presently contains about 20 scientific workers.

A new and very important development of the Geophysical Observatory is going to begin. The U.S. Congress has voted an appropriation of \$975,000 for the construction and equipment of the Observatory. The first stone of the new building was laid in the spring of 1949; the work will last one year. It is foreseen that the funds designated to assure the maintenance of the observatory will be increased from \$220,000 to an amount between \$500,000 and \$750,000 a year. The number of the workers will reach 60 to 75. Dr. Seaton hopes it will be possible to develop



The 1949 campus during construction of the Geophysical Institute Building (far left); The well-wired Eielson Building in 1947 or 1948 (men with sextant may be making solar observations to compute refraction of the atmosphere); Stuart Seaton (right) with radio operator at the Ballaine Lake Field Station, where a battery of receivers was used for radio propagation studies; the exterior at Ballaine Lake.

in collaboration with the university, the teaching of geophysics which will lead to the doctor's degree.

One can be sure that this Geophysical Institute situated in the immediate vicinity of the auroral zone, in a region marked for great development, possessing a frequently clear sky and endowed with powerful means, is going to play a capital part in arctic geophysical research.

I want now to transmit a request from Dr. Seaton. Gathering all works published about the high atmosphere is very difficult because they are distributed in a great number of publications treating very varied subjects. It would be appreciated if the scientific workers who still have reprints of their works on this subject send copies to: Geophysical Observatory, College, Alaska.

During a six week's sojourn at College with my American colleague, Don Williams, we participated in the life of the observatory and appreciated the friendliness of its director, Dr. S.L. Seaton, and the spirit of cooperation which was shown by Observatory members...who helped make successful our program of auroral observations. We are grateful to them for their kindness.



GEOPHYSICAL INSTITUTE

In this 1944 photo, Seaton (left) poses with staff outside the Eielson Building. He arrived in 1941 from the Department of Terrestrial Magnetism, Carnegie Institution of Washington to install equipment and operate an ionosphere observatory.

The Early Years —

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from the great circle course, examination of rapid fluctuations in the earth's magnetic field, measurement of night sky light, and surface illumination determinations.... Seismological and magnetic work sponsored by the Coast and Geodetic Survey was continued until 1948 when that agency established its own permanent Observatory on the University campus. All other studies were guided by the Carnegie Institution of Washington, Department of Terrestrial Magnetism....

The strategic study of high-latitude geophysical problems for the Navy and the War Department during the war gave further momentum to the effort to establish a permanent arctic research facility. In 1944, the American Geophysical Union and the National Research Council endorsed the idea of a UA geophysical observatory. When the relatively elaborate war-time research effort ended in 1946, the university again sought federal help. A campus site was offered to the United States if the government would fund the institute.

In 1948 the university formed the Geophysical Observatory, an interim organization that was to have "cognizance over basic research in the natural sciences," and Seaton was appointed director. In April of that year Congress authorized a Geophysical Institute at UA and appropriated \$975,000 for construction. The building, completed in 1950, was later renamed to honor Professor Sydney Chapman. When the institute was formally established in 1949, Seaton was appointed director and the observatory organization was dismantled.

These events probably influenced the university decision to start a graduate school in 1949, despite its small faculty and research staff. At the time UA had fewer than 425 students and only seven persons on the natural science faculty. The resident staff of the Geophysical Observatory consisted of Seaton, three academic fellows, four members, and six associates.

Because the developing institute has always been funded primarily by research grants and contracts, meeting various functional needs has often demanded resourcefulness from scientists and students. Seaton described one such effort: *The two spectrographs used in the Polar Year program...were left...for operation in connection with the auroral program.... When this program was discontinued the spectrographs were stored for a time, later dismembered by curious undergraduate physics*



After fostering university development for 27 years, Charles Bunnell was honored at retirement on President Emeritus Day, July 1, 1949. The institute was formally established that day, and a Masonic cornerstone ceremony was held for its new building (Bunnell is at front left, Stuart Seaton at far right). A copper box placed in the cornerstone contained a vacuum tube representing scientific achievement; copies of the *News-Miner*, *Farthest North Collegian*, and *Jessen's Weekly*, university and institute documents, and mementos: St. Lawrence Island harpoon head, Alaska jade fragment, gold nugget, and coins.

students, and finally abandoned in a dusty corner. Through the efforts of the Institute staff and following vague memories of the past, most of the essential parts...were recovered in 1949. One...has been rebuilt...[the other is being remodeled].... While slow, the instruments will be most useful when adapted for photoelectric recording of twilight emissions in the ultraviolet and infrared spectral regions.

Describing some 1948-1949 microwave-meteorological studies, he said: *The equipment used throughout was of prototype construction. Consequently much effort was expended in keeping the various devices in operating condition. The entire instrumentation demanded constant attendance. Because the only suitable remote station location was on a bluff removed from civilization, almost insurmountable difficulties were encountered in keeping the installation manned and supplied. This was especially true when ambient temperatures were in the vicinity of 60° F. below zero. Much greater success would have been achieved at a fraction of the cost if thoroughly reliable equipment had been installed at the start.*

Seaton held strong ideals about the nature of basic scientific research. He wrote: *...Perhaps the most fundamental concept...is that advances in knowledge are accomplished by inspired, trained individuals working in an atmosphere of complete freedom on problems of their own choice. Fundamental research is unorthodox, brilliant, arduous, demanding, and difficult. It cannot be directed any more than could the course followed by Columbus across the uncharted Atlantic have been directed. Thus, the financing of basic research should be in such a manner that direction of the research does not occur by virtue of the source of income...*

Seaton's tenure as institute director was short. He resigned his post in May 1950 after a difference of opinion developed between himself and the university administration concerning formation and funding of the proposed graduate school. When he resigned, most of the institute staff left with him—a rocky start for the new institute as it entered the decade of the fifties.

— Doreen Fitzgerald

Institute workers create assistance fund

Institute people have successfully launched a Fund for Employee Assistance to help out coworkers when personal disasters occur. An April 29 auction raised over \$4,000 for the fund from bids and direct contributions. Goods and services were donated by GI employees for the event.

The fund was established because insurance and other personal resources often don't cover the unexpected financial burden of such emergencies as illness, accident, death, or fire.

"We came up with this idea after a family member of a coworker was seriously injured in an accident," said Rose Watabe, one of the two staff members who initiated the fund. "We wanted to prepare a means for offering

a helping hand to institute people when they're facing family emergencies."

After Watabe and Evelyn Trabant brought the idea forward, they worked with Penelope Dufseth and Associate Director Merritt Helfferich to develop it. The fund will be financed by special events and tax-deductible contributions from employees and others. An administrative agreement with the UA Foundation was approved by university administrators in February.

"The institute has long been like a family to those who work here," said Trabant, "so there's no better place for a people-helping-people program to work. We can have fun raising money and at the same time express our concern about taking care of our own."

"It's often difficult to offer help individually," Dufseth said. "The fund gives us a way to help people in a timely and meaningful way, even though they may be unlikely to ask when they need it most."

Along with the auction, several women employees instigated a "Mr. GeoWhiz" contest, in which anyone could buy votes for their choice. The voting garnered \$245 for the cause and caused Dr. William Stringer to be declared the man of the hour.

Any employee may seek assistance directly or on behalf of a coworker. Grants will be made from income and principal of the fund for any appropriate purpose. A four-person committee (election in progress) will allocate the grants. "We hope that donor generosity, energetic fund raising, and careful management will ensure the annual growth of the fund," said Helfferich.

Contributions can be made at any time, in person or by mail, to the Geophysical Institute Fund for Employee Assistance, University of Alaska Foundation, 910 Yukon Drive, Suite 202, Fairbanks, AK 99775. Institute employees may contribute to the fund through payroll deductions.

Antarctic research

continued from 2

is similar in both places," he said, "but in Antarctica we had the best bush cook in the world."

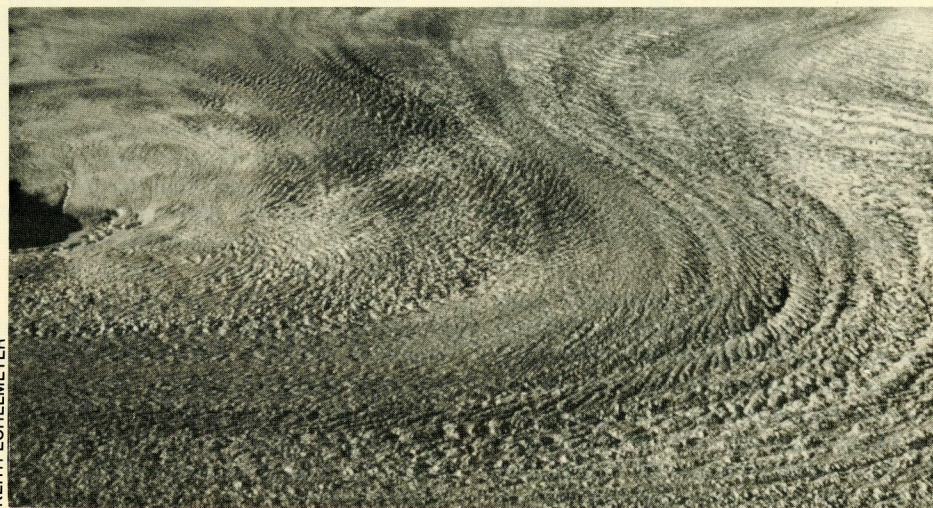
Despite the difficulty of metabolizing what Harrison called "about 100,000 calories a day" provided by that excellent cook, the team amassed data on the speed of Ice Stream B, using two different survey systems. They also embedded strain meters and geophones in bore holes to sense erratic ice behavior.

"These large ice streams seem quite unstable in their behavior," Harrison said. "Ice stream C is a stagnant neighbor of Ice Stream B. It was once as active as B, but now the crevassed surface is buried under so much snow people estimate it's been quiet for perhaps 200 years. It may have once carried the ice flow now carried by Ice Stream B."

Harrison said the present interest in Ice Stream B was stimulated by a University of Wisconsin seismic study suggesting that almost the entire flow of the Ice Stream B is carried by a thin layer of deforming sediment at the base of the ice. This is the first observation of such behavior.

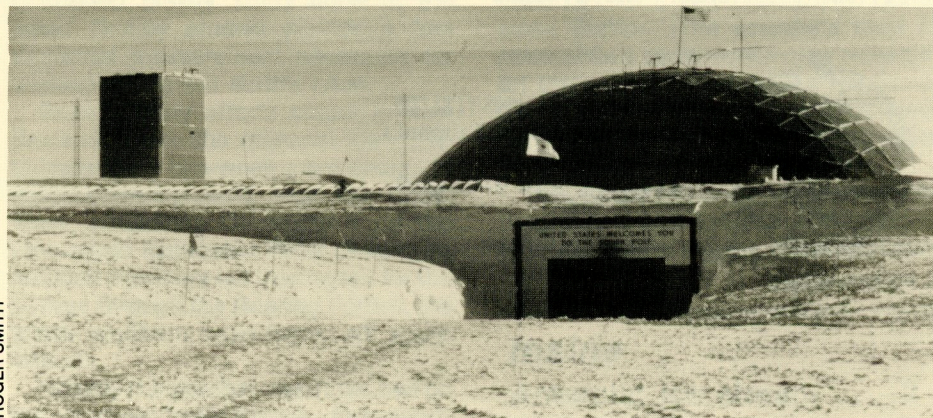
It will take several months for the team to analyze the data gathered during this field season and integrate it with that gathered by other project scientists. This includes ice drilling by researchers from the California Institute of Technology and technicians from the Polar Ice Coring Office, a group recently relocated to the University of Alaska Fairbanks campus. Teams from NASA and the universities of Wisconsin and Kansas were also active in the area.

— Carla Helfferich



KEITH ECHELMEYER

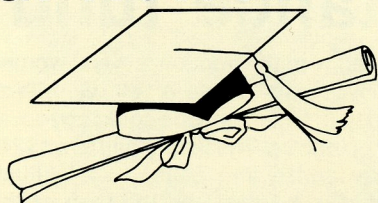
Jacobshavns Glacier in Greenland, like the antarctic ice stream, forms a more swiftly moving river within the slower ice sheet.



ROGER SMITH

During the 1988-89 Antarctic summer, Roger Smith of the institute's aeronomy group traveled to South Pole Station to install optical equipment for upper atmosphere research. Aeronomy work in the Arctic and Antarctic will be covered in the summer issue of Geophysical Institute Quarterly.

GI Notes...



CONGRATULATIONS are in order for our spring 1989 graduates. A Ph.D. in physics was awarded to **Mark Mandt**; **Matthew Sturm** and **Gerald Walker** earned doctorates in geology-geophysics. Master of science degrees in physics were awarded to **Chris Grimm**, **Kim Kangas**, **Nettie LaBelle-Hamer** and **Don Rice**; earning MS degrees in geology-geophysics were **Jean Johnson**, **Ming-chi Lu**, **John Power**, **Charlotte Rowe**, and **Paul O'Sullivan**.

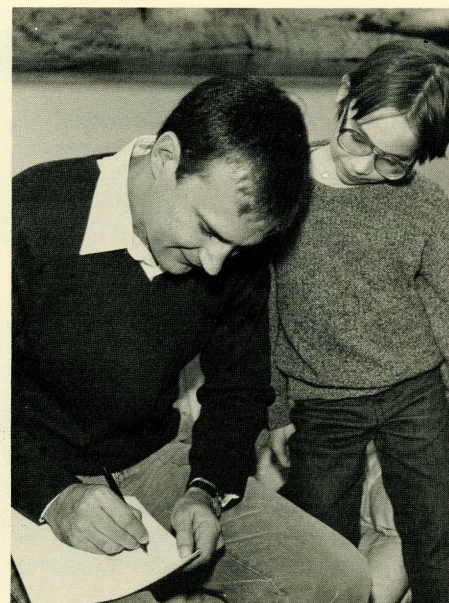
RADIO WAVE PROPAGATION research at the institute, described in the January *Quarterly* (Vol. 7, No. 2), has been summarized in a paper, "Medium-Frequency Skywave Propagation at High Latitudes: Results of a **Five-year Study**." The paper has been accepted for publication in the *Institute for Electrical and Electronic Engineers Transactions of the Broadcast Technology* for June 1989. The issue is devoted entirely to the standard (AM) broadcast band. Most of the funding for this long-term research project was secured through the Federal Communications Commission by Alaska's Senator Ted Stevens.

THE SPECTACULAR AURORAS seen over Alaska in March were a preview of the expected increase in auroral activity in the 1990s and a fitting prelude to a special aurora exhibit at the University of Alaska Museum. The show, "**In Light of the Aurora**" opens **July 16** and runs through October 22 at the museum on the UAF campus. The aurora was also the subject of the *Scientific American* May 1989 cover story. "**The Dynamic**

Aurora," an eight-page article by GI Director Syun-Ichi Akasofu, discusses the mechanisms that power auroral displays and the auroral substorm, the systematic brightening of the auroral curtain from late evening to midnight.

ANTARCTIC RESEARCH is the focus of *Antarctic Journal of the U.S.*, published by the National Science Foundation. It reports U.S. antarctic activities, related activities elsewhere, and trends in the U.S. Antarctic Research Program. The journal is available for \$13 (\$16.25 foreign) a year from: Superintendent of Documents, Government Printing Office, Washington, D.C. 20402-9371. *The Antarctic Century* is available from Oceanites, a nonprofit educational and scientific foundation dedicated to increased public awareness and knowledge about Antarctica and the living marine resources of the Southern Ocean. For more information, write: Oceanites, 2378 Rt. 97, Cooksville, MD 21723.

ANTARCTIC RADIO COMMUNICATIONS are expected to improve with a system developed in Alaska that bounces radio waves off the electron trails of meteors. In January, Meteor Data Inc. of Anchorage successfully established a test link between McMurdo and South Pole, two U.S. research stations 840 miles apart. This is the first known use in Antarctica of **meteor-burst radio**, a method for sure, low-error-rate transmissions. The concept has been known for 40 years, but only became practical with the advent of compact, low-cost microprocessors. The system will be used by the National Science Foundation primarily to link McMurdo, the U.S. logistics hub, with inland stations and remote field parties. NSF hopes to issue the equipment to field parties during the 1989-1990 antarctic summer.



JIM COCCIA

When several astronauts and support personnel visited the institute in April to familiarize themselves with the aurora, ten-year-old Jason Rohwer took the initiative to get an autograph from astronaut Rick Hieb. Jason is the son of programmer Celia Rohwer of the Computer Resource Center.

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