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HOBACK RIVER AND VALLEY NEAR CAMP DAVIS

Field Courses in Geology and Surveying

Summer Session
June 19 to August 11, 1939

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JENNY LAKE AT THE FOOT OF THE TETONS

SUMMER SESSION ADMINISTRATION

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LOUIS A. HOPKINS, Ph.D., Director
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CAMP DAVIS ADMINISTRATION

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CAMP DAVIS, ROCKY MOUNTAIN FIELD STATION

FIELD STATION AND AREA FOR FIELD WORK

THE University of Michigan was a pioneer in the establishment and maintenance of a camp for summer field work. Camp Davis was organized under the supervision of the late Professor J. B. Davis in 1874, for field instruction in surveying. The camp occupied several sites in Michigan until 1929, when the University purchased lands in Jackson's Hole, Wyoming. For fifteen years a geology camp was maintained in Kentucky. A site near State Bridge, Colorado, was then occupied for three summers. During the summer of 1938 courses in geology were offered for the first time at Camp Davis, the Rocky Mountains field station of the University. Courses in both geology and surveying will be offered at Camp Davis during the summer of 1939.

Camp Davis is located in the valley of the Hoback River, twenty miles southeast of the town of Jackson and seventy-five miles south of Yellowstone National Park. An excellent road, U.S. Highway 187, which connects the Lincoln Highway at Rock Springs, Wyoming, with Yellowstone National Park, passes within a mile of the camp site. The elevation of the camp is 6,113 feet above sea level. The summer climate is almost perfect for field work. The sun shines practically every day, and the nights are always cool. Although the camp is surrounded by a forest reserve, the valley lands and many mountain slopes



PALEOZOIC STRATA IN GRANITE CREEK CLIFFS

along the Hoback River are not timbered. The surrounding area is ideal for field work in surveying.

The Camp Davis region offers an unusual variety of geologic features. Strata representing nearly all of the systems of the Paleozoic, Mesozoic, and Cenozoic are exhibited in numerous excellent exposures. Several fossiliferous formations in these systems offer material for paleontological study. A wide variety of structures, such as gentle anticlines and synclines, sharp folds, steep faults, and low-angle thrusts, is displayed. Pre-Cambrian crystallines are well exposed and show a diversity of structures characteristic of metamorphic and igneous rocks. Extrusive rocks of Cenozoic age are also present.

The camp has accommodations for approximately forty students. The residence buildings are fourteen feet square and have sheet-steel sides and roofs and concrete floors. Water is supplied under gravity pressure from a small mountain stream south of the camp site. The camp has a modern sanitary system, hot and cold showers, and is lighted by electricity.

The work of the summer is arranged to provide for a trip to Yellowstone National Park. Nearer points of interest, such as the great slide



OVERTURNED ANTICLINE IN HOBACK CANYON

on the Gros Ventre River and the beautiful lake country along the base of the Teton Mountains can be visited on week ends. The automobile journey from any part of the United States to Jackson's Hole is an inspiring experience.

The following pages describe the courses offered in geology and surveying for the summer of 1939.

GEOLOGY

OBJECTS OF THE FIELD COURSES

The Department of Geology of the University of Michigan believes that field instruction is fundamental to a satisfactory training in geology whether the training is introductory and cultural or advanced and professional. For students experiencing their first year in the field this instruction should be as broad and unspecialized as their introductory courses in physical and historical geology. In order that these objectives be reached, an area for the field instruction has been chosen having a wide diversity of geological phenomena and a climate congenial to vigorous and enthusiastic work.



DRAG ON UPTHROWN SIDE OF FAULT—GROS VENTRE MOUNTAINS

The first course in field geology, Geology 125, is intended for two classes of students: (1) for those who are professionally interested in geology; and (2) for those who desire some practical knowledge of geology as a part of a general education.

Advanced students electing Geology 202 or 203 will be trained in their special fields of interest. An important part of this training will be the field study of one of the many interesting geological problems in the region.

COURSES OF INSTRUCTION

125. FIELD COURSE IN GEOLOGY. This is a first course in field geology, and introduces the student to field methods. The student will be instructed in the observation, measurement, and recording of geological data, in the recognition and interpretation of the varied geologic phenomena, and finally in the compilation of the geologic history of the area. *Prerequisites: Geology 11 and 12, or their equivalents. Geology 165 and Mineralogy 107 are strongly recommended.* Associate Professor EHLERS and Assistant Professors EARDLEY and BELKNAP. Eight hours credit.



A LECTURE IN THE FIELD

202. RESEARCH AND SPECIAL WORK IN PHYSICAL GEOLOGY. *Prerequisites: Geology 125 and 165 and Mineralogy 107, or their equivalents, except for advanced students whose previous training may allow special consideration.* Assistant Professors EARDLEY and BELKNAP. Credit to be arranged.

203. RESEARCH AND SPECIAL WORK IN STRATIGRAPHY AND PALEONTOLOGY. *Prerequisites: Geology 103, 104, 125, and 165 and Mineralogy 107.* Associate Professor EHLERS. Credit to be arranged.

PROGRAMS FOR FIELD WORK

Geology 125

Students enrolled in Geology 125 will leave Ann Arbor by automobile at 7:30 A.M., June 19, on a faculty-conducted trip to Camp Davis, Wyoming.

During the course of this trip of one week's duration students will be given a broad survey of the physiography, stratigraphy, and structural geology of the area between the Great Lakes region and the Teton Mountains. Some of the geologic features to be noted en route are the Driftless Area of Wisconsin, the Bad Lands of South Dakota, the Black Hills uplift, and some of the ranges of the Rocky Mountains.



BAD LANDS OF SOUTH DAKOTA NEAR CEDAR PASS

Students from institutions located between Ann Arbor and Camp Davis may arrange to join the party at a designated place.

After reaching Camp Davis, the work in Geology 125 will consist of instruction in geologic field methods. A brief reconnaissance trip over the Camp Davis area will be taken first to acquaint the students with the rock sequence, after which the stratigraphic section will be measured. In the course of this work, instruction will be given in the use of the Brunton compass, Locke level, tape and pacing, and in methods of recording observations. This instruction will be followed by a study of the igneous and metamorphic rocks, special stress being laid on age relations and the character and structural features of these rocks. With this training the student will be ready to appreciate the structural geology of the region, observing at this time a variety of folds and faults and their bearing on the distribution of the rocks. This work will be followed by a study of the physiographic processes which are in operation today and have been effective in the past. Some of the major items of this study are concerned with rock disintegration, transportation by and deposition from rivers, the development of valleys and ridges, terrace gravels, and the effects of mountain glaciation.

During the period spent at Camp Davis, students interested in physiography will be given an opportunity to see the work of glaciers in the Teton Mountains under the guidance of Professor Belknap. Students interested in structural geology and paleontology may have time to examine nearby areas of great interest in these fields of study in company with Professors Eardley and Ehlers.

The latter part of the field work will consist of a detailed geological examination of a selected area. This will involve the making of a geologic map with cross sections and the writing of an outline of the geologic history of the area.

Geology 202 and 203

The programs for work in these courses are arranged to suit the needs and interests of the individual student and are planned after conference with the station staff.

INDEPENDENT INVESTIGATORS

Through the courtesy of the University administration, Camp Davis and certain equipment are available for a limited number of independent investigators interested in the problems of the region. The only expense of these investigators is a fee of \$1.50 a day, which provides board and lodging.

Applications for quarters should be made to the Director.

FEES AND EXPENSES

A fee of \$45 is payable to the University on registration. This includes tuition, lodging at Camp Davis, and the use of instruments for field work.

The cost of transportation from Ann Arbor to Camp Davis and return will be about \$10. Students planning to return home instead of to Ann Arbor at the close of the work will find the cost of transportation less or greater than that indicated.

The cost of meals and lodging during the faculty-conducted trips from Ann Arbor to Camp Davis, and the return journey to Ann Arbor will be about \$30.

Board at Camp Davis will be approximately \$50. A board deposit of \$52.50 will be made upon reaching Camp Davis. At the close of the session the difference between this amount and the actual cost will be refunded.

The necessary expenses, consisting of the items listed above, are \$135.

APPLICATION AND REGISTRATION

Because the enrollment in geology will be limited, *immediate application by letter addressed to G. M. Ehlers, Director of Geological Field Work, University Museums, Ann Arbor, is necessary to ensure admission.*

Undergraduates not registered at the University must submit credentials (official transcripts) to the Dean of the College of Literature, Science, and the Arts, accompanied by a statement that they desire to enroll in the field courses.

Graduates seeking higher degrees or expecting to earn graduate credits to be transferred to other institutions are required to register in the Horace H. Rackham School of Graduate Studies. Those not already admitted to the Graduate School must be formally admitted by the Dean of this School either by personal interview or after written application accompanied by full transcripts of undergraduate and graduate credits. A transfer of credit to other graduate schools cannot be made unless the procedure of formal registration in the Graduate School has been fulfilled.

A limited number of women may enroll for the field courses. Women must receive permission to enroll from Dean Alice Lloyd and the Director of geological field work.

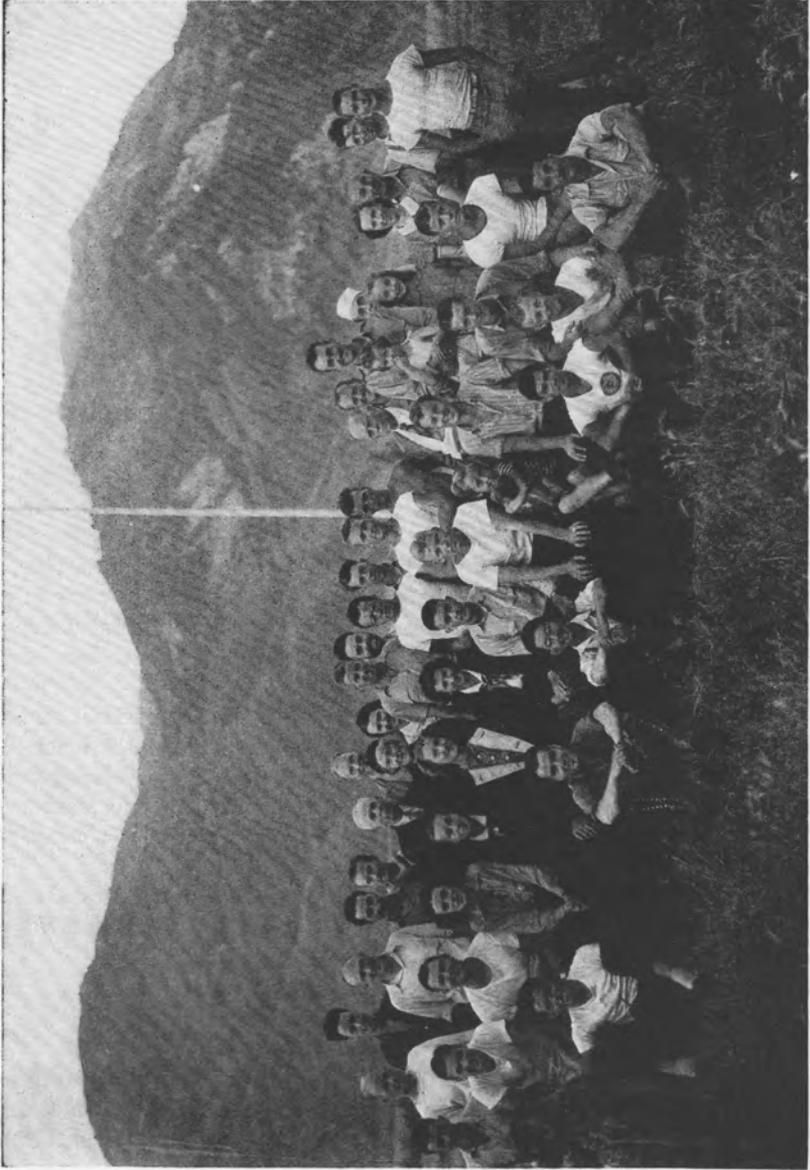
Students must obtain statements from the University Health Service or their home physicians that they are physically fit for field work at an average elevation of 7,000 feet and present such statements to the Director of geological field work before permission to register can be given.

Inasmuch as water used by students on the trip to Camp Davis and return may happen to be contaminated, all registrants should be inoculated against typhoid. Students attending the University of Michigan during the semester preceding the field season may obtain inoculation at the University Health Service. *The inoculation is given over a period of two weeks and should be started at once.*

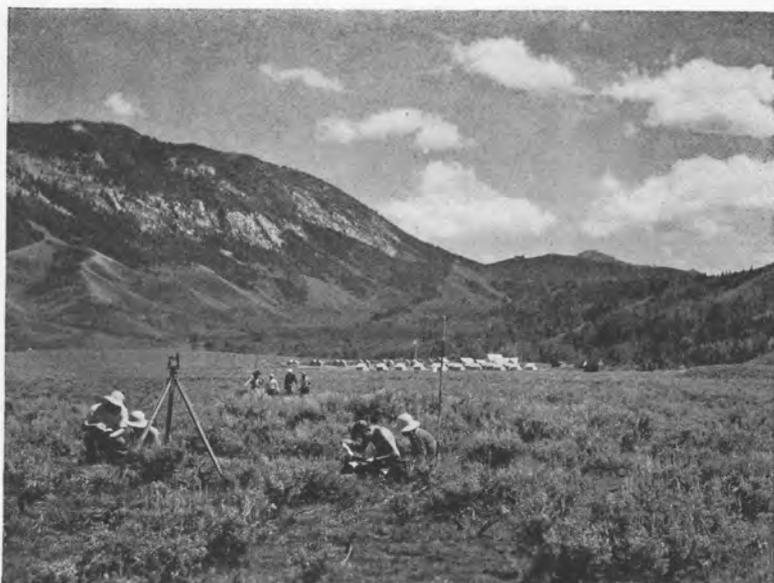
Registration begins May 15 and will continue until the courses have been filled. Withdrawal of registration after June 1 will involve the forfeiture of \$10.

CIRCULAR OF INFORMATION

A mimeographed circular, which gives essential detailed information in regard to mail, express, freight, directions for joining field party, and personal equipment and supplies needed for courses, will be sent to those who register for the field work. Anyone interested may obtain this circular on application to the Director of geological field work.



SURVEYORS AND GEOLOGISTS—CAMP DAVIS, 1938



SURVEYORS AT WORK—FIELD COMPUTATIONS

SURVEYING OBJECTS OF THE FIELD COURSES

The aim of the courses is to give the student of civil engineering or of geodesy and surveying a thorough training in field practice. The University of Michigan fosters a camp which will attract students who are interested in surveying and who, as a result of their training and experience, will stimulate the best surveying practice throughout the country. Every effort is made to make the field conditions similar to those which the engineer is likely to encounter in the practice of his profession.

COURSES OF INSTRUCTION

3. SURVEYING. Adjustment of instruments; astronomical applications, time, azimuth, latitude and longitude; lines of communication, circular and easement curves, profiles, topography, grades, cross sections; baseline measurement; triangulation; public-land surveys; topography; project surveys; computation of field data; making of maps and diagrams; preparation of permanent records of work performed; camp construction and maintenance; and many things which relate to the welfare of those who live in the open. Field problems,



ROUTE SURVEYING

office work, five and one-half days a week. *Prerequisites: Surveying 1 and 2, or 12 and 13; two hours credit in practical astronomy.* This last prerequisite may be met by electing two hours of Surveying 6. Eight hours credit.

6. SURVEYING. Special advanced work can be provided for those who have received credit in Surveying 3. Credit, two to eight hours, depending upon the character of the work.

FEES AND EXPENSES

A fee of \$45 is payable to the University on registration. This fee includes tuition, lodging at the camp, and the use of the necessary instruments and equipment. The residence buildings are provided with beds, mattresses, and blankets. Pillows and sheets are not furnished.

Meals are provided at cost. Each student deposits \$60 in the camp mess at the beginning of the session. At the close, the difference between this amount and the actual cost is refunded. The cost for the summer of 1938 was \$56.

The total cost for the summer should not exceed \$150. From past experience it has been found that three or four students driving together from almost any part of the United States can complete the work and see all points of local interest for this amount.



SOLAR OBSERVATIONS FOR AZIMUTH

APPLICATION AND REGISTRATION

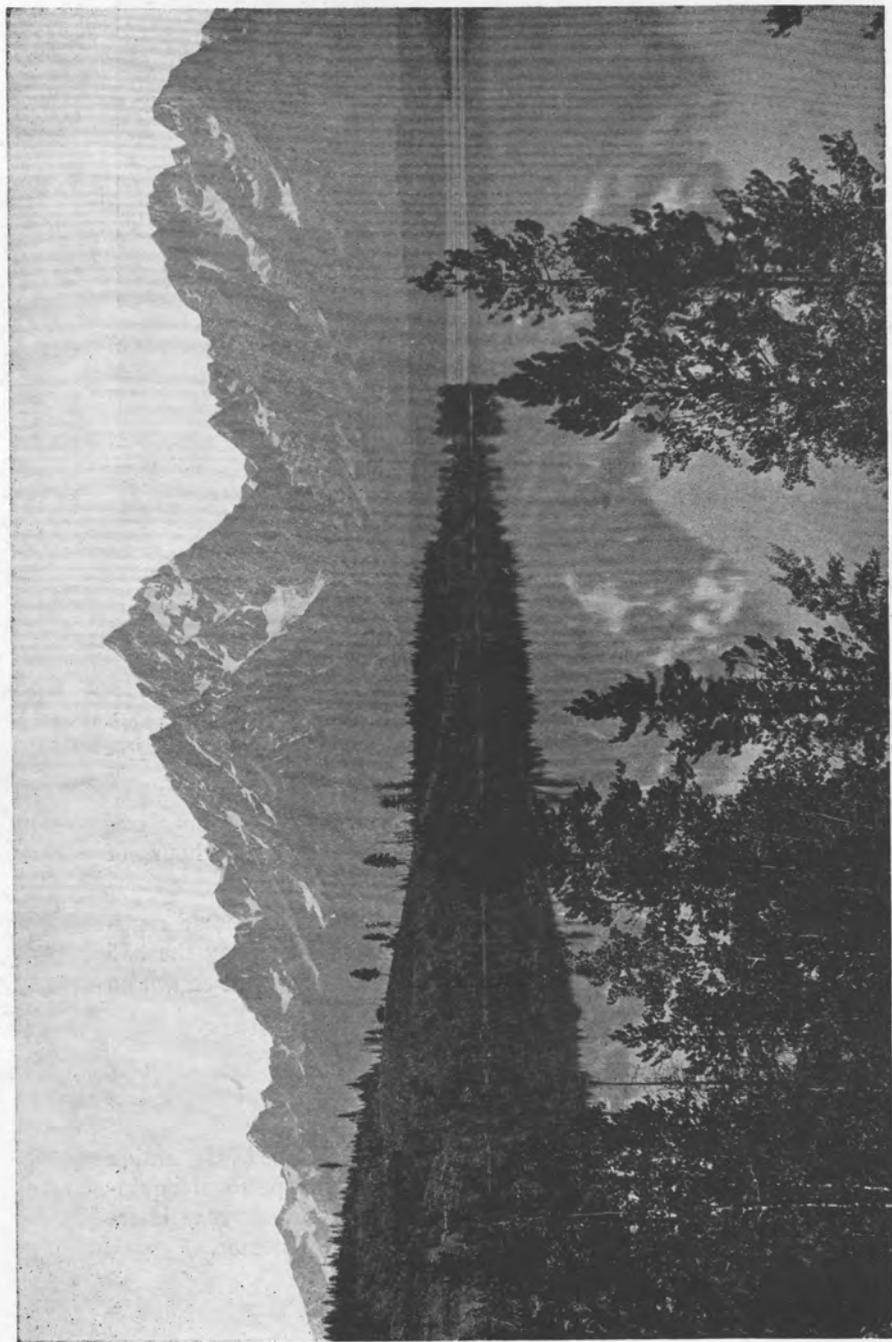
Since the enrollment in surveying will be limited, *immediate application by letter addressed to Harry Bouchard, Director, 207 West Engineering Building, Ann Arbor, is necessary to ensure admission.*

Undergraduates not registered at the University must submit credentials showing they have completed at least seven credit hours of preparatory work in surveying.

When the student's application has been approved he should register with the Secretary of the College of Engineering and pay the \$45 fee to the University Cashier. The Cashier's receipt must be shown on reaching the camp.

CIRCULAR OF INFORMATION

A mimeographed circular, which gives essential detailed information in regard to mail, express, and directions concerning personal equipment will be sent to those who register for field work. Anyone interested may obtain this circular on application to the Director.



TETON MOUNTAINS ADJOINING JACKSON LAKE