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**GUIDEBOOK**  
**THE TOBACCO ROOT GEOLOGICAL SOCIETY**  
**1976 FIELD CONFERENCE**

*History of the I. V. field station.*

*Vitaliano, C. W.*



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## FOREWORD

This guidebook-journal has been prepared by the editorial staff of The Tobacco Root Geological Society (TRGS) through the cooperation of the Montana Bureau of Mines and Geology. The Tobacco Root Geological Society is an organization of professional and interested amateur earth scientists, which grew from a group of alumni of the Indiana University Geologic Field Station (IUGFS) situated in the Tobacco Root Mountains near Cardwell, Montana.

The Tobacco Root Geological Society hopes to present periodic field conferences in the Northwest and to present a journal that will serve as a vehicle for disseminating the results of the numerous geologic studies underway in the region. Much of the research is conducted by graduate students through the geologic field stations that various universities maintain in the region.

The first article in this volume, entitled "The Indiana University Geologic Field Station, the Early Days", by Charles J. Vitaliano, Indiana University, illustrates how progressive-thinking educators thirty years ago, as well as today, have endeavored to provide the maximum exposure of students to geology while simultaneously incorporating into educational curricula the new technology for earth sciences research.

The officers and editors of the TRGS thank Professor Vitaliano and all of the other individuals who have taken time from their busy schedules to contribute material to this guidebook and the 1976 TRGS Field Conference. We hope that this effort can be repeated on a regular basis so that The Tobacco Root Geological Society will become known and respected for its geologic presentations in the Northwest.

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# INDIANA UNIVERSITY GEOLOGIC FIELD STATION,

## THE EARLY DAYS

by

Charles J. Vitaliano\*

When Professor Charles F. Deiss became chairman of the Indiana University Geology Department in 1944, one of his primary concerns was the establishment of a geologic field station in order to provide a field training program so essential to a well-rounded geological curriculum. His requirements were specific. 1) Such a field station should be located in a region where a wide variety of geology and geological features were available for study. 2) The geological features should be present on a scale commensurate with the duration of a six-to-eight-week field course in order to permit the student sufficient variety and the opportunity to synthesize his observations. 3) The field station should be equipped with all the facilities necessary for the standard amenities so that students and staff could be free to devote the major part of their time to the learning and teaching of geology.

One of Professor Deiss' first tasks, therefore, was to add a field geology course to the geology curriculum. Dr. Deiss, like many other geologists of the day, was a staunch advocate of field mapping by means of the plane table and alidade. The technique of mapping on air photos was still very new and only beginning to come into its own. During the summer of the second year of his tenure at Indiana University, he personally conducted the first Indiana University Geology Department field course. As a base of operations Dr. Deiss chose the Yellowstone Big Horn Research Association camp at Red Lodge, Montana. The year was 1947--the students proceeded to the camp located on the eastern flank of the Beartooth Mountains at Red Lodge, Montana, in their own vehicles. Plane table equipment was the order of the day. The entire six weeks, with the exception of an excursion for approximately one week to Glacier Park, was spent mapping a narrow strip of the geology along the east front of the Beartooth Mountains by means of plane table and alidade. Parties consisted of three students: an instrument man, a note man, and an alidade man. All parties mapped the same area and generally just managed to stay out of each other's way. The summer's field work included a report on the area, due the following fall semester. The current Friday field exercise method of review was non-existent, and the only change in the daily routine was the above-mentioned excursion to Glacier Park.

The town of Red Lodge being very convenient, the students spent many evenings studying local town life rather than working on their maps. A serious automobile accident (fortunately, not fatal), which occurred one evening when some of the students were returning from a night on the town, brought about an important change in Field Station procedure. Dr. Deiss decided, as a result, that Indiana University should, in the future, provide the vehicles that were to be used for Field Station purposes. The University concurred in this decision, and the next year, 1948, when I joined the Field Station staff, we used official university vehicles for the first time.

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That year the field course again was based at the Yellowstone Big Horn Research Association camp at Red Lodge. For the first time we traveled in caravan to and from Red Lodge. Caravan travel back home was Dr. Deiss' wish. I was in charge of the logistics--motel arrangements, car care, instruction, grading, first aid, etc. With three assistants, I carried the instruction duties for 21 students.

Prior to starting out, Mrs. Vitaliano and I spent many busy hours, evenings and weekends, preparing a road log for the trip out and for the return trip. We should have had a trial run, but neither funds nor time were available to do so. On the trip out, we would drive for a while until we arrived at a geologic feature that I thought I recognized. The caravan would draw over to the side of the road, and because we had no radio communication between cars, I would proceed down the caravan car by car explaining the geology to be observed. At times everyone in the car was asleep except the driver, and often the only question was when do we get to our next rest stop. Nevertheless, it was excellent experience for me. I began to have some idea of the geology along the route to the Field Station and as a consequence my concept of the geology of the northern part of the United States increased by leaps and bounds. Upon the caravan's arrival at Red Lodge, Dr. Deiss was already there and waiting for us. The students were readily settled in and after a shower and a good meal were ready (but not necessarily eager) for the next morning to arrive so that they could begin their first day of field work. Mrs. Dorothy Heaven, the main secretary in Dr. Deiss' office, was the liaison person, typist, general factotum, etc., who kept us in touch with the "Home Office". The field course that second summer was expanded to include a trip through the Yellowstone National Park region in the geologic reconnaissance excursion of Glacier National Park led by Dr. Deiss. This was the first effort to introduce the students to some aspects of volcanic geology and stratigraphy. The course went off without incident.

Dr. Deiss, however, was not satisfied with the opportunities for geologic field study available at the Yellowstone Big Horn Research Association Camp. The Association's field headquarters were admirably suited for use as a base for extensive regional studies but not for map teaching such as he had in mind for the students from Indiana University. Therefore that summer, he and I began to look over some possible sites for a field station in the areas he had known during the years he had taught and done field research at the University of Montana at Missoula. We also checked on existing field station headquarters such as that of the University of Michigan camp in the Hoback Range, the camp used by a consortium of Midwest schools, near Dubois, Wyoming, and others.

The site of the present Field Station on the South Boulder River in Montana was included in the search. I most vividly recall that visit. Dr. Deiss, as was his custom, was leading the excursion to Glacier National Park, and he planned to take the entire group up the South Boulder Canyon. He had apparently made up his mind that the site was the one he was seeking and was ready to show it to the group. We arrived there late in the evening, and it thus formed a logical stopping point in the day's run. We proceeded up the canyon, past the site, to Mammoth, where Mr. Eildert Vry, caretaker for the Mammoth Gold Mining Syndicate, permitted the group to stay overnight in the vacant mining cabins. We carried sleeping bags in those days, so there was no problem about bedding. We had eaten dinner en route and thus the meal was no problem either. Breakfast next morning, however, did present a problem. Mammoth had no restaurant facilities, and the nearest were at Whitehall or Ennis. To complicate matters somewhat, it rained hard during the night, and bright and early the next morning we started out from Mammoth on wet roads. It was downhill all the way to the Carmichael Creek site where

we stopped to look over what was to be our new field station area. Then Dr. Deiss made the decision to proceed to Ennis for breakfast. The time was about 7 o'clock. As some of you may recall, the foundation of the back road to Ennis, especially beyond the Carmichael Summit, contains a considerable amount of bentonite. For hours later, after much pushing and shoving and pulling of cars out of the mud, we arrive at Ennis--as murderous and disheveled-looking a lot as anyone had ever seen. Only one restaurant was open, and when we entered, the proprietress and the young lady helping her were ready to leave by the back door. We assured them, however, that all we wanted was food. When they protested that they could not handle all of us at one time, we suggested that they just leave the kitchen to us and supply us with the necessary materials (eggs, batter for pancakes, bread for toast, and coffee), and we would do the rest. They agreed--probably still half-frightened out of their wits--and they just let us take over the restaurant. We proceeded to prepare our own breakfast. At the end we carefully calculated the cost for everything we had ordered and eaten, paid in full, and were highly complimented when with broad smiles on their faces they assured us that anytime we wished to return they would very gladly turn the place over to us again. The rest of the excursion went off without incident.

It was finally decided that the site for the new Geologic Field Station for Indiana University should be at the confluence of the South Boulder River and Carmichael Creek. The land involved, about 20 acres in all, was included in the Taylor-Wagner Grazing Act, and some legal work was necessary in order for Indiana University to purchase the land. The rancher who held the land in lease was willing to permit the sale of the land to the State of Indiana but wanted to be reassured that he could, if he released his grazing rights to the land involved, retain grazing rights on the rest of the area. This was readily accomplished, and Indiana University became proud owner of 20 acres of Montana mountain-valley land.

The land acquired, plans were drawn up, and construction on the new camp began. Dr. Deiss spent many hours in conference with the contractor and with Mr. Vry from Mammoth, who became our first caretaker. The camp was to be ready when the 1949 summer field course group arrived. Thus, in June 1949 our caravan consisting of forty-two students and four assistants took off for the new field station. Routine on the trips out and back was similar to that of the previous year. As I had had no previous experience with the geology in the vicinity of the Field Station, Dr. Deiss agreed to go over the stratigraphic section with the students on our first day in the field. Meanwhile, I had learned about radio intercommunication for cars from Professor Fox of Princeton University. I approached Dr. Deiss on the possibility of installing such equipment in the vehicles. Funds were not available, but in any case Dr. Deiss was adamant--he would have nothing to do with the "squawk boxes" as he called them. In retrospect, I am relieved that he would not. The early intercom systems were not nearly as reliable as the present ones, and I am no Dr. Mead when it comes to electronic equipment.

Despite faithful promises of the contractors to have everything ready by the time we arrived at the Field Station, upon our arrival we found ourselves in the midst of all sorts of construction. On our first night at the station, Mrs. Shedd, our cook, and her helpers served dinner amidst the hammering and banging of the carpenters and other construction people who were to be with us in various degrees for virtually the entire summer. To make matters worse, Dr. Deiss had become so involved with the construction that he had to inform me, that the first night, that he would be unable to take time out to conduct the students over the stratigraphic section. What a dilemma! Fortunately, Jack R. Pickering, who the year before had been a field assistant with one of our former graduate students, James V. Barnes, and who was fairly well acquainted with the section,

happened to be in camp that evening. He saved the day for me. After dinner the two of us took off on a reconnaissance trip down the South Boulder River and, as a result, I was able to outline the stratigraphic section pretty well the next day.

During the first year at the new Field Station, plane tabling was again the order of the day. We ran only one session in those early years. Along with the several assistants, I was in complete charge of instruction. Dr. Deiss looked after the catering, logistics, and in-camp routine, and conducted the trip to Glacier National Park. Several three-man parties were assigned to each of the four assistants, and as sole instructor, I made the rounds to check in with every party every day. The areas were scattered and ranged as far away as Mount Donerty, north of Cardwell. Things went very well, and some excellent and meaningful plane table mapping on a semi-regional scale was done that summer. The Yellowstone National Park region was visited again that year, and by the end of the season the only incident of any note was the brush one of the parties had with a black bear. The caravan trip home took a different route and required its own itinerary, which had been prepared beforehand.

By the summer's end, however, it had become evident that plane tabling was not going to be the ideal method of doing geology at the Field Station in the future, and the means for change appeared to be at hand. This was in the form of a new series of topographic maps for the Missouri Valley Project prepared by Fairchild Aerial Survey Company for the U.S. Bureau of Reclamation. These had just come to my attention, and as luck would have it the Field Station was located just on the western border of the mapped area. The excellent (for that time) photogrammetric topography offered a good base for mapping on a regional scale. That winter I ordered and received the most pertinent of the new topographic maps, and I began to section out areas of reasonable size, which were to be mounted on a firm backing material to be used for regional mapping. It was my plan to combine the plane tabling of a local area with a more extensive regional area mapping. In addition another change was in the making--a new instructor, Professor Roger E. Dean from Toronto, had joined our ranks and was to accompany me as a second instructor, thus lightening the load a bit. With Mrs. Vitaliano's and Professor Dean's help we prepared a second guidebook covering a slightly different route. Sparse accommodations available at that time in the then-existing motels required that we split our group. We devised a "northern" and a "southern" route. The return trip from the Field Station gave each group a chance to see the geology of the alternate route. This second year at the Indiana Field Station went considerably more smoothly than the first. The presence of the additional faculty member was a great help in reducing the workload and afforded both Professor Dean and me a little time to look around the country and along with it the opportunity to piece some of the geology of the environs together and to fit the geology at the field station into a more coherent picture. We were then to expand the map areas, and above all we were able to spend at least twice as much time with each party as had been possible previously. At the end of that season the two homeward bound caravans were in the charge of Professor Dean and one of the assistants. I went off to New Mexico to work on U.S. Geological Survey reports.

Other things of moment occurred that year. Chief among them was the visit to the Geologic Field Station of Professor Wayne R. Lowell from the University of Montana at Missoula. Professor Lowell was to join our staff in Bloomington the next fall as Professor of Economic Geology. He also was slated to take over as director of the Field Station in 1951. I was scheduled to reactivate my W.A.E.\* status with the U.S. Geological Survey, which I did, and to change

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\*When Actually Employed--a designation used by the U.S. Geological Survey for its part-time geologists and other employees who are on its permanent staff but work only part time.

positions at Indiana University from Professor of Elementary and Field Geology to Professor of Petrology. Professor Lowell's first change in the Field Station program was the introduction of mapping on air photos and the elimination of plane table work entirely.

Other changes in the Field Station program have occurred through the years, chiefly in response to technological advancements. For example, radio intercommunication is now available between the Field Station and the fleet of vehicles used to convey students to the numerous study areas. In addition to the radio's educational value, it provides increased safety and efficiency for everyone involved with the Field Station program. A complete sample-preparation laboratory is available at the Field Station to allow interested students a chance to see specimens in thin section. A library is maintained at the Field Station, which on occasion is used by industrial mining geologists in the area. In general every effort is made, and has been made over the years, so that the Indiana University Geologic Field Station, under the direction of Dr. Judson Mead, Professor of Geophysics, can provide opportunities for undergraduate as well as graduate students to study geology in-the-field rather than field geology.