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Associated Students of the Montana College of Mineral Science and Technology

The AMPLIFIER

Montana College of Mineral Science and Technology

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GUESS WHAT?

FINALS ARE HERE!

Snow, what danger beneath thee lurks?

Although it may not show it on the surface, a cover of snow on a hillside is potentially dangerous. This point was emphasized in a talk on avalanches given on February 19 for Sigma Xi by Dr. Charles C. Bradley, Dean of the College of Letters and Science at Montana State College.

Dr. Braley pointed out that after several personal experiences with avalanches, he felt he should know something about their cause. After discussing various types of avalanches and people who have worked with them, he summarized the work he has done recently in the Bridger Range near Bozeman.

Falling snow accumuiates in a layer of familiar light snowflakes. Under this layer, crystals of snow are fusing into larger crystals or granules which are compacted into a dense mass. At the base of the snow, because of latent warmth in the ground or other factors, the snow is weakened. When it becomes too weak to support the mass above it, the layers of snow above slide over the weaker layer to produce the familiar avalanche.

In potential avalanche areas, the strength of the snow at the base should be lower than in normal areas. To measure this strength and thus predict the stability of the snow, Dr. Bradley devised what he calls the Bradley Resistometer. It consists in part of a blade that is thrust deep into the snow and then rotated. The resistance the snow offers to rotation then gives a measure of the strength. At the same time, it measures the load of the snow above. A ratio of the strength to the load gives a general concept of the stability of the snow pack, for a low value will indicate conditions favorable for an avalanche. This method could be very helpful as a warning method for skiers.

Dr. Bradley received his Ph.B., Ph.M., and Ph.D. degrees in geology from the University of Wisconsin. His Ph.D. was earned in petrography, a special field of geology.

At the University of Wisconsin, he was in charge of their survey of geology course and taught a section in general geology. He was also an instructor in social education on the staff of the Wisconsin Student Union and taught photographic techniques in White School of Photography, New York.

In 1950, he came to Montana State University as an instructor in geology. He became an assistant professor in 1951, an associate professor in 1954, and a full professor in 1957 when he was also made dean of letters and science.

In addition to research on granite and metamorphic rocks, Dr. Bradley has published geologic notes on Adak I and the Aleutian Chain in Alaska, and has written an article on the Precambrian Complex of Grand Teton National Park, Wyoming, for the Wyoming Geological Association Guidebook.

Dr. Bradley belongs to the Geological Society of America, the America Geophysical Union, the Northwest Scientific Association, Phi Sigma, Sigma Xi, and Phi Kappa Phi.

Sigma Xi, a new organization on campus, arranges scientific lectures to be given on campus. Although it is a faculty organization, Tech students or any interested persons may attend a lecture. More than 60 people attended this first lecture of Sigma Xi.

Dr. Charles C. Bradley

Tech given $5,000

Montana Tech has been awarded $5,000 by the Standard Oil (Indiana) Foundation, Inc., in connection with the Foundation's program of aid to higher education, according to Dr. Edwin G. Koch, president of the college.

Montana Tech is the only Montana college to receive this grant and is one of 25 institutions of higher learning in the United States to be so honored.

John H. Lind, evecutive director of the Foundation, notified Dr. Koch

(Continued on Page 3)

Inspecting the Canyon Creek Mine of the Stauffer Chemical Co. are (from left to right) Robert Gale, Bill Pierre, Bill Williams, and Professor Van Matre.

Professor Donald W. McGlashan has been named as Director of Research and Development.

Dr. Kenneth N. McLeod has been appointed Dean of Academic Affairs.

Professor Koehler S. Stout is the Chairman of the Engineering Division.

Montana Tech undergoes administrative reorganization

To serve the needs of a growing school more quickly and efficiently, an administrative reorganization has hecently been completed at Montana Tech. Under the new system, departments at Tech are separated into either the Engineering Division or the Arts and Sciences Division. Formerly the only division was on the basis of their being degree-granting or nondegree-granting departments.

Grouped in the Engineering Division are the departments of Engineering Science, Geology, Metallurgy, Mineral Dressing, Mining, and Petroleum. Into the Arts and Sciences Division are grouped the departments of Chemistry, Humanities and Social Sciences, Mathematics, Physical Elucation, and Physics. The departments in each division are directed by a chairman. In turn, the two divisions are coordinated by the Dean of Academic Affairs who reports directly to the President of Montana Tech. Under the previous system, department heads reported directly to the President.

Another new position has been formed for a Director of Research and Development. He is responsible for the development and the securing of support for programs and projects. Like the Dean of Academic Affairs, he wil report directly to the President.

Professor W. Clifford Laity, Head of the Department of Humanities and Social Studies, has been named Chairman of the Arts and Sciences Division. Professor Laity received his B.A. in History at the University of Washington in 1937 and his M.A. in History at the same university in 1939. He has also served as an assistant in the department of History at the University of Washington, as a teacher at Helena High School from 1938 to 1943, and as a critic teacher (part time) at Carroll College for the 1942-43 schol year. He has served on the faculty of Montana Tech for 23 years.

Head of the Department of Engineering Science, Professor Koehler S. Stout, has been named Chairman of the Engineering Division. In 1948 Professor Stout received his B.S. in Mining Engineering at the Montana School of Mines. He received his M.S. in Geological Engineering at the Montana School of Mines in 1949, and in 1957 he received his LL.B. in Law from LaSalle Extension University. From 1950 to 1952, he worked as a mine engineer and later as a mine foreman and captain at the Mt. Hope Iron Mine at Dover, New Jersey. He then came to Montana Tech, where he has served on the faculty for 15 years.

Dr. Kenneth N. McLeod, Head of the Department of Chemistry,

Professor W. Clifford Laity has been named Chairman of the Arts and Sciences Division.

has been appointed Dean of Academic Affairs. Dr. McLeod received his B.S. in Industrial Chemistry in 1932 at Montana State College, his M.S. in Inorganic and Analytical Chemistry at Oregon State College in 1935, and his Ph.D. in Physical-Analytical Chemistry at the same college in 1937. From 1934 to 1940 he was a teaching assistant at Oregon State College, and from 1940 to 1946 he was an instructor and Associate Professor at Willamette University. Since then, he has served 20 years on the faculty at Montana Tech.

Named as Director of Research and Development is Professor Donald W. McGlashan, Head of the Department of Mineral Dressing. Professor McGlashan was awarded his B.S. in Mining Geology at the University of Idaho in 1934, his M.S. in Mineral Dressing Engineering at the Montana School of Mines in 1937, and his Met.E. in Metallurgical Engineering at the University of Idaho in 1955. From 1935 to 1937 he worked as a graduate assistant at the Montana School of Mines, as an instructor at Pennsylvania State University from 1937 to 1941, and as an Assistant Professor at Pennsylvania State University in 1946. He came to Montana Tech in 1946 and has been a member of the faculty for 21 years.

Spring registration schedule announced

The procedure for spring term registration has been announced by Dr. McLeod, Dean of Academic Affairs. The registration procedure, which is similar to that used last fall, is as follows:

Students will first report to their adviser to plan their schedule and prepare a trial schedule on the "Sectioning Approval" Sheet. The sectioning approval sheet, when signed by the adviser, is then taken by the student to the various departments for approval of sections or by individual instructors for approval of admission to a course. Upon approval of registration in a course or assignment to a section, the instructor should initial the sectioning approval sheet in the proper place and issue to the student a class card for the proper course and section. A second card with the student's name on it should be prepared and retained by the instructor as a temporary record until the official class lists are issued from the Registrar's office about two weeks later. When all sections or courses have been approved, the student should return to his adviser and complete official registration forms.

It is recommended that upper division and graduate students register Thursday, February 2, and that the lower division students register Friday, February 3, 1967.

Any necessary changes in registration may be made on Monday, February 6th. Fees may be prepaid any time prior to February 6th. Students who have valid excuses for not registering on these dates should make an effort to take care of registration before these dates.

Tech to offer extension course

A field and workshop course in Petroleum Conservation for Montana secondary and elementary school teachers will be offered this summer for the first time at Eastern Montana College in Billings.

The purpose of the course is "to provide Montana secondary and primary school teachers with an intimate working knowledge of the intricacies of the petroleum industry in Montana and of its importance to the economy of the state."

The course, "Mineral Resources Conservation—Petroleum," will begin June 5 and end June 30. Montana Tech will award the four credits given for the workshop. These credits will qualify for renewal and reinstatement of class one and class two teaching certificates.

Each student will receive a complete course syllabus and outline. Transportation on scheduled field trips will be provided by the Montana Petroleum Association.

Professor Gustav Stolz, Jr., Head of the Petroleum Engineering Department at Montana Tech, will be the coordinator and will work in conjunction with Mr. Ben G. Havdahl, Executive Secretary of the Montana Petroleum Association.

Application forms may be secured from Professor Stolz at Montana Tech. Completed application forms must be received by March 4 and up to forty participants will be notified of their selection before April 15.

Good grief, Charlie Brown! Finals have sneaked up on us again

STEVE BAUER

Want to do your buddies a favor? Don't study for any of your finals. You may become a hero by lowering the test average, thereby allowing your friends to get better grades. You might also advance a step up the academic ladder to help your country at friendly Saigon U.

Finals are like the last stretch of a foot race. Those who start strongest don't always come in first. The best strategy for this kind of race is to maintain a fast pace while conserving enough energy for the final sprint. If you can keep close enough to the men in front, this final sprint can win the race for you.

School can be called a race because you are in a competition for grades on the basis of mental ability. Strategy can be efectively used here also if you know the factors that are involved.

More than half of you are attending Montana Tech for the first time. It is a little late now for strategy to do you much good on this series of finals. However, after struggling through one semester, you can rest, review it, and plan for the next one.

Finals are probably the most important part of the semester, for a poor performance in three hours can destroy a semester's work. If a final counts one half to one third of your grade, you don't want to be careless about studying for it.

Rather than carelessness in preparation, however, nervous exhaustion is probably the largest factor behind poor results in finals. Like physical exhaustion, it destroys your ability to study efficiently. Unfortunately, it is a subtle ailment that often goes unnoticed. It's symptoms are normally careless mistakes on tests or going "blank" during a test that you have worried about and studied so hard for.

There is no one simple way to avoid the effects of nervous strain. Relaxation between periods of study may help. Breaking monotony of study to do other things may also relieve the tension. But each person is a little different in the way school pressures effect him. You are largely on your own to find the way you can work most efficiently at the end of the semester. If you develop a successful pattern, your grades will show it. If not — well, try again.

Sophomore activities are reviewed

The Sophomore Class began the school year well, by winning first place in the annual homecoming parade. The float on the theme "Melt Northern's Castle" was one with which the entire class was well pleased, and those who participated in the work were glad to see that their efforts were successful. The Circle K float shared top honors. This club, incidentally, is composed of several sophomores.

The prize money was added to contributions from the sophomores to buy a floral weath for Dr. Adam Smith.

The sophomores were in charge of arranging the Thanksgiving Dance this year. Light colored streamers of brown, yellow, and orange decorated the lounge. Music was provided by the Dardanelles. The theme was "Turkey a Go-Go" and in the center of the dance floor was a vigorous go-go turkey in a cage. Despite the late notice for the holiday dance, there was a good turnout.

In intramural football, the winning teams were largely made up of sophomores.

Officers were elected in September. I was elected president, Mike O'Keefe, vice-president, and Don MacIntyre, secretary.

Those who had participated in preparing the float and decorating the SUB for the Thanksgiving Dance are to be highly commended for their hard work and long hours in making the sophomore activities successful.

Miss Diane Wegner, the sophomore adviser, has been a marvelous aid in giving the class her motherly advice.

Joe Mattioli
Sophomore Class President

"We are all laymen, only some more so than others."—Dagobert Runes

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"Men who do not make advances to women are apt to become victims to women who make advances to them."—Walter Bagehot

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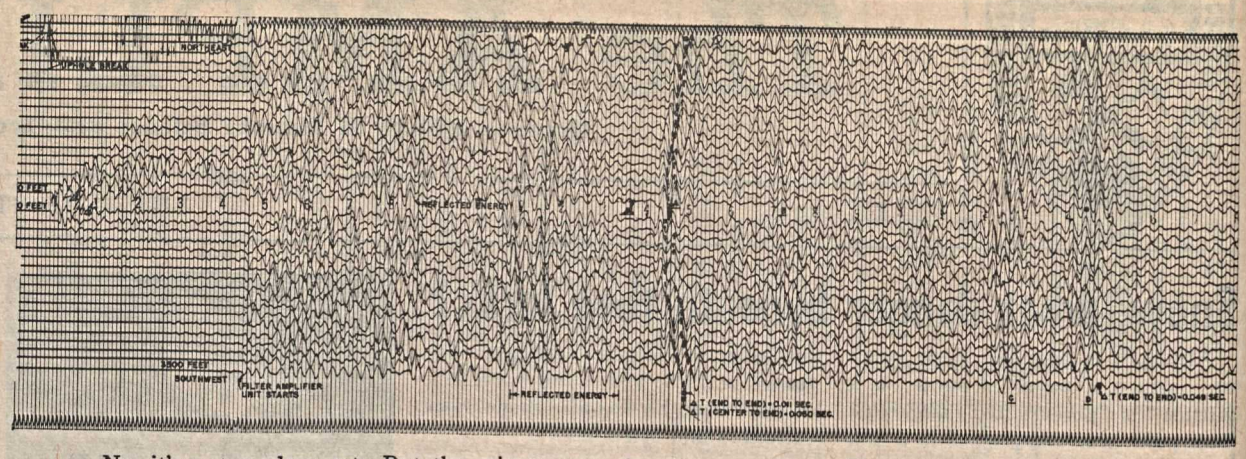
STANDARD



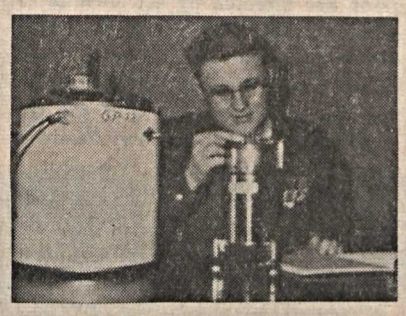
No, it's not modern art. But the seismogram above is part of a modern field — Geophysical Engineering. The darker vertical traces on the record are "events" which are interpreted to show the depth of a geologic structure.

Geophysical Engineering offers challenge, travel opportunities

What do **you** plan to study in college? After college, what will you do? These are important questions because your future depends to a large extent upon your college studies. Have you ever thought of exploration geophysics as a career?

Geophysics means the physics of the earth and exploration geophysicists measure some physical property of the earth to locate mineral deposits. Today many geophysicists are oil-finders; however, the mining industry is leaning on the geophysicist more and more to find new places where miners can dig for iron, copper, mineral sources for atomic energy, and other important natural resources. Exploration geophysicists do not find oil or other minerals directly. They find the geologic conditions that should trap these natural resources. The geophysical industry is only 40 years old but is a rapidly expanding one.

Many different methods are used for finding oil and mineral, with the geology, climate, and terrain all playing an important role in the choice of methods. Gravity, magnetic, and electromagnetic surveys



Cross-calibrating two gravity meters is Will Goldberg, a senior in Geophysical Engineering.

are used for finding ore deposits such as copper and iron. In the seismic method, dynamite is used to send energy or sound waves down into the earth. The different layers of rock act as reflecting surfaces causing the sound waves to bounce back to the surface of the earth. The geophysicists places detectors, called geophones, on the surface of the ground to record the sound reflections. From the time taken by the sound waves to do down and be reflected back to the surface, the geophysicist can map the under-underground layers. The seismic method is just one method of geophysical prospecting and is used extensively by oil companies in their search for oil.

Where will you work?

In exploration geophysics, you can work anywhere—the choice is yours. Geophysical crews can be found on every continent of this world, and who knows, they may even be on the moon in the not-too-distant future. For single young men with a few years' experience in the United tates, the prospect of travel is alluring and challenging. For men with families, the hardships are now oversome or easily adjusted to. There is a trend toward doing most of the office work and interpretation in the larger cities or towns. Hence if **you** wish, you may be permanently based in a large city conducting field work quite successfully from your office.

Opportunities.

In such a young science, job opportunities are very good. Many people in the profession are employed by geophysical prospecting companies, by oil companies, or as consultants in prospecting work. Others are in research, in laboratories, in government service, and in teaching at colleges and universities. Oil and gas exploration is a big field, though mining geophysics is now a rapidly growing field. At one time, oil compaies would hire any science or engineering graduate and train him to be a geophysicist. Nowadays the field is becoming so specialized that industry is seeking geophysically trained college graduates.

The backbone of geophysical exploration is field work. It is here that the basic data that may lead to a new mineral deposit are gathered. The work is very important and most new employees begin their geophysical work with field parties.

In the laboratory, research is very important for a young science like geophysics. Bright young engineers are needed to design new instruments, solve difficult field problems, check and test new equipment, and invent new and better field methods.

In administration, the geophysical industry needs young men who will advance into top level management. Here the geophysicist plans geophysical programs, supervises field crews, or even is owner of his own company. The geophysicist may become an executive for a geophysical prospecting company or may work for a large oil or mining company.

The number of colleges offering courses in geophysics increases every year. Thus, there is an ever increasing need for teachers in geophysics. While an advanced degree is required, the work is very important in preparing future generations of educated young people and mineral finders.

$50,000 a year starting salary

No, starting salaries in exploration geophysics are nowhere near $50,000 a year. However, they are slightly higher than those offered any science or engineering graduate. Advancement is fast for a bright young man. What is more important is the personal satisfaction of working in a job that is beneficial to society—a job that will tax your brain power and imagination to the limit. There is always something new to learn in exploration geophysics.

What it takes to be a geophysical engineer

Are you a better than average student? Do you enjoy the adventure of outdoor activities like camping, hunting, fishing, and hiking? Do you enjoy traveling? Can you work with and get along with your fellow students? If you can give an honest "Yes" to most of these questions, you are suited for a career in exploration geophysics. Montana Tech first offered a degree in geophysical engineering in 1965. This degree is probably one of the toughest on campus for it requires courses in mathematics, physics, geology, and geophysics, as well as the all important basic courses in humanities and chemistry. This college is well equipped with geophysical equipment for student field work problems. These problems involve actually producing seismic records with the college's seismic truck and "rediscovering" ore veins on the hill by gravity, magnetic, and electrical methods.

For further information contact Prof. Marshall or Prof. McCaslin of the Physics Dept. in the Petroleum Building.

Bob Heaphy, a senior in Geophysical Engineering, makes a correction on a magnetometer with a helmholtz coil.

Bond's Eye View

This year 'E' days fall on February 25 and 26. Now is the time to be thinking about how you can best sell the merits of your department to the public and to the rest of the student body. Who knows? Maybe your idea will cause your department to win the grand prize.

The students and young visitors who have not yet picked a major field will find 'E' days an excellent opportunity to browse through all of Tech's departments and find out first hand what each has to offer.

Dillon may have beat us in basketball—but our band scored 300 to 0 against the Dillon music department.

To comment on the voting for or against the amendments to our Student Body Constitution: We voted down the five dollar increase in fees that would have allowed us to enjoy our live music mixers in the SUB. And all along I thought that everyone was really enjoying them.

We voted in the amendment that says that we do not trust ourselves to run our own business. I heard the comment that the Austrialian ballot system was a good one to have and that it should be voted in. If the person had only looked on any of the bulletin boards on the campus, he would have seen that we already had the Austrialian ballot system. The only change was that now we must have, by constitutional law, some member of the faculty watching over us as we vote and as the votes are counted.

Few, if any, of the student body attend the regular student council meetings. Few attended the convocation to discuss the proposed amendments, and had there been enough students present, these students could have elected changes or proposed other amendments or proposed the repeal of such.

What I am attacking here is not the amendments or the student council, but our lack of participation and interest in our own affairs. There is no intelligent discussion around; all I hear are remarks about the draft or who is taking out what girls or who gives the roughest tests and that sort of thing. I do know the feelings that run around this campus, and some of this spirit is pretty sick. It seems at times that the students are saying "I just don't care."

* * * *

George Bernard Shaw said it. "There are two tragedies in life: Not to get what the heart desires—the other: To get it."

Ernest Bond

Future Events

FEBRUARY

3—Basketball game, Eastern at Billings
4—Basketball game, Rocky Mtn. at Billings
4—First semester ends
6—Registration Day
11—Basketball game, Northern at Butte
14—Basketball game, Western at Butte
17—Basketball game, Rocky Mtn. at Butte

MARCH

20-26—Easter Recess

Dr. Earll speaks to Mineral Club

The Mineral Club held its first meeting of the new year on Wednesday, January 11, 1967, at 7:30 P.M. in the Mill Building.

Dr. F. N. Earll gave an excellent talk entitled "Gem Pegmatites of California." He discussed the geology and mineralogy of the California pegmatites as compared to the "usual" pegmatite. He gave hints on how to successfully cut and polish the gem tourmaline found in the pegmatites, and told about several of his interesting experiences in hunting for the elusive gems.

The business portion of the meeting was confined to reading of the treasurer's report. At the next regular business meeting the first draft of the new Mineral Club constitution will be read and discussed.

Marcus muses:

There's someone gone!

I miss that solemn little fellow who trudged quietly up and down the hill those many years, brief case in hand.

I suppose the students miss him too, in a way — their lighthearted, life-assured way — shocked a brief while by the cruel needlessness of his going; but I wonder just how many are able to transpose the fateful circumstances into the pattern of their own lives to gain any lasting awareness of the utter irrevocability of action heedlessly taken.

Perhaps some will understand — and that might help to soften just a mite the awful futility of the tragic loss of him.

Who knows?

Do you,

You, I mean — you, here, blithe one, bestraddle those two hundred and fifty horses.

Pete Norbeck, senior in Geophysics, is shown checking the seismograph equipment. Politically active Teresa Knox straightens out a picture of the late John F. Kennedy, whom she greatly admires.

Teresa Knox, Pete Norbeck spotlighted

Chosen for the spotlight in this issue are Teresa Knox and Pete Norbeck.

Teresa, a sophomore, is taking engineering graphics, theory of sets, American history, history of civilization, and is also on the Magma staff. She plans to graduate from Montana Tech with a degree in Petroleum Engineering.

Teresa is president of College Young Democrats and is the recording-corresponding secretary of the Newman Club. She is also a member of Chi-Rho and of Associated Women Students. She works as a nurses aid at the St. James Community Hospital.

Her hobbies are reading and skating. She likes to embroider and is very interested in drama. When asked what she thought of Montana Tech, Teresa said she liked it very much. She said she thinks both the teachers and the curricula here are good.

Also in the spotlight for this issue is Pete Norbeck, a senior in geophysics. Pete is taking psychology, hydrology, petroleum geology, and advanced computer this semester. He works at the Montana Tech computer lab in the evenings and also works with the seismograph here.

He is a member of the Sigma Rho Fraternity and also of the Geophysics Club. His likes include hunting, fishing, and shooting. Skiing is also a favorite activity.

After graduation this spring, Pete plans to obtain work in the geophysics field.

$5,000 given Tech

(Continued from Page 1)

that there are to be three $1,000 awards in recognition of outstanding teaching in the under-graduate program during the current academic year. Announcement of the faculty recipients will be made at the college's commencement in June.

The remaining $2,000 is for unspecified purpose and can be utilized by the college as the administration feels necessary.

Dr. Koch stated, "It is a great honor for Montana Tech to be chosen as one of the recipient institutions. Since the caliber of teaching at the college is academically outstanding, the selection of faculty award winners will pose a major problem. We are indeed grateful to have a problem of this nature and to be selected for inclusion in this magnificient program of the Standard Oil (Indiana) Foundation. It is indeed gratifying for us to be one of so few colleges from the entire nation to be recognized in this manner. The unrestricted $2,000 will help materially in the purchase of instructional and research equipment."

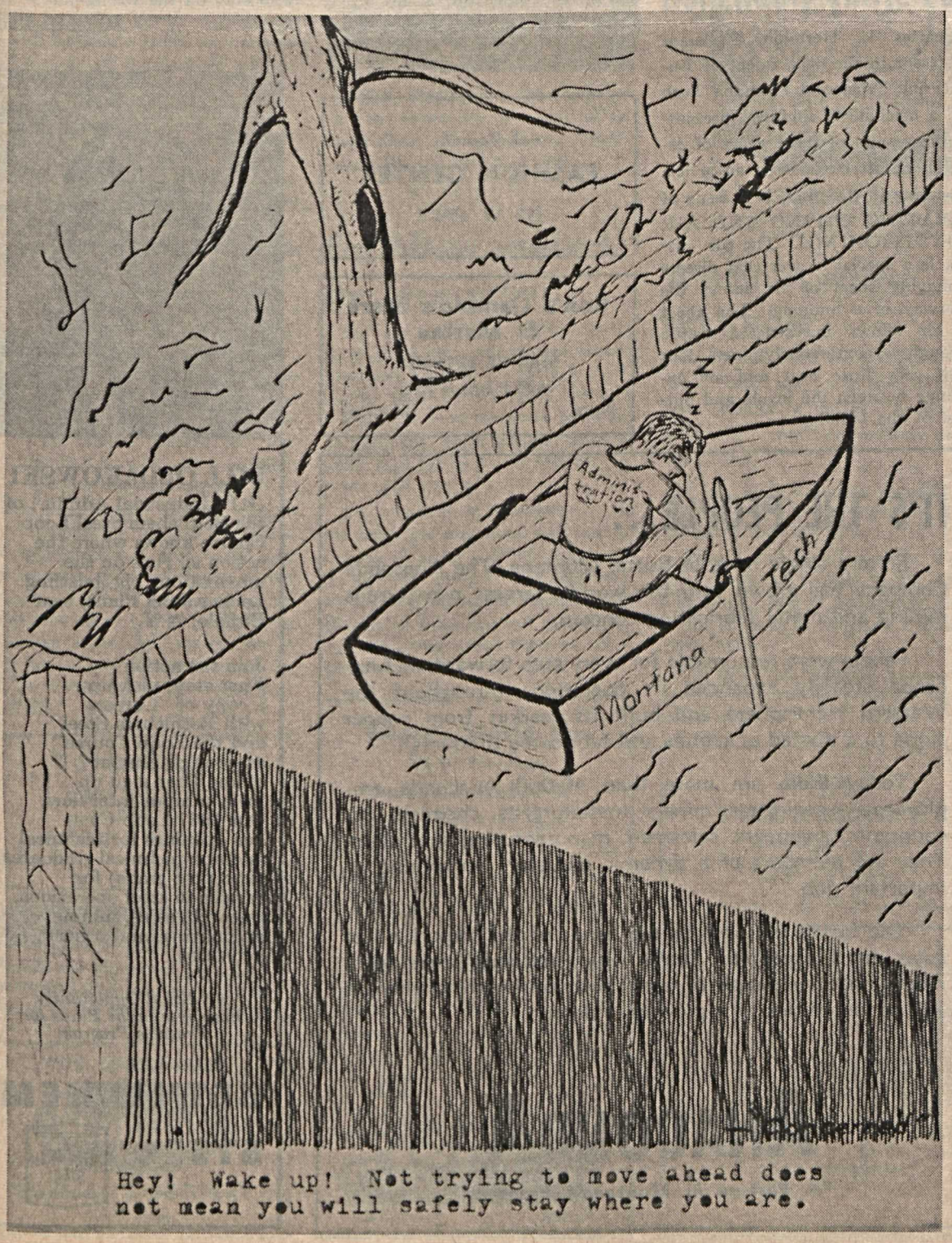
Dr. Warren has paper in journal

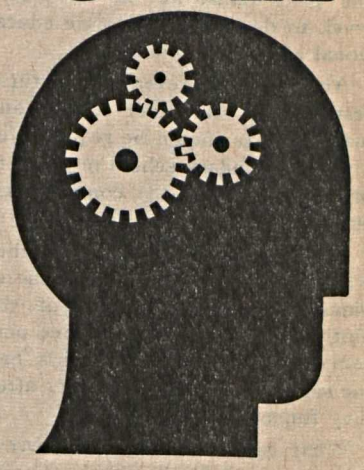
A paper by Dr. Herbert G. Warren, associate professor of petroleum engineering, was published in the December, 1966 issue of the **Society of Petroleum Engineers Journal.**

Entitled "Correlation of Interfacial Tension of Hydrocarbons," the paper was written in collaboration with E. W. Hough, now at Southern Illinois University.

The subject is the mathematical analysis by computer of the methane-n-heptane and ethylene-n-heptane systems.

At the time of the experiments and writing, both authors were at Mississippi State University.





This view suggests that there are just enough parking spaces at Montana Tech. However, a recent study by Joe Konicki indicates there are more spaces than there are cars at the present.

Study shows parking poses problems for coming year

An analysis made by Joseph J. Konicki, a junior at Montana Tech, has revealed some facts that might be taken into consideration to prevent a severe parking problem in the coming academic year. The study was made for a technical writing assignment.

The space provided for the parking of cars for faculty and staff is ample for the time being and will be ample also for the coming year, the report states. Currently, there are 100 spaces provided for these cars, and about 87 are currently in use. The number can accommodate expansion.

The 97 students living in the residence hall and the 346 members of the freshman class compose the group that does not park cars on the campus proper. For the remaining students, 149, Tech's campus provides 176 parking spaces. These spaces are located in the circle, between Park Street and the circle, the west parking area behind the SUB.

An increased enrollment, predicted for the 1968-1969 school year, will bring an increase in the cars that will need spaces for parking. If the enrollment of freshmen equals that of this year, and 60% of each class returns, there will be a need for 231 upper class parking spaces, 55 more than are available. The study proposes that the campus facilities be restricted to juniors and seniors, and that the underclassmen be restricted to parking in the west lot, on Park Street (off the campus) and on Leonard field. The proposal also includes the blacktopping of both the west parking lot and the field, and the lining of them to provide ease of entrance and exit. It also advocates the repairing of the tunnel leading from Leonard field to facilitate access to the school from the cars parked in this area.

Education for girls is no longer adequate

Project Talent, a large-scale study of about 440,000 of the nation's young people, indicates that the education given to our nation's girls is not even adequate to prepare them for occupations as responsible citizens or parents.

The American Institute for Research and the University of Pittsburgh, with support from the United States Office of Education's Bureau of Research, gave the test to students in twenty high schools in the country in March of 1960. The results were studied in terms of what happened to these students over a five-year period.

The data revealed that the girls do better or as well as boys on tests such as Arithmetic Reasoning, Reading Comprehension, and Creativity when tested in the ninth grade, but three years later the boys did better in all but the Reading Comprehension Test. This was partly because the courses the girls took in secondary school were inadequate, since the girls failed at the secondary level, to develop appropriate educational and career plans.

Another fact revealed by these tests shows that more science and math courses should be required for girls in secondary school in order to prepare them for the complex scientific age in which they live.

Girls also show much instability when choosing appropriate career plans. Thirty-one percent of the ninth grade girls and forty-one percent of the twelfth grade girls had the same career plans one year after they finished high school.

What can schools do to correct this situation? High school counselors can urge more girls to take courses that require logical reasoning and problem solving. Also, parents can urge their child to learn more about the world of work, including the requirements for and financial advantages of diferent kinds of work.

Professors help in education course

Dean Gustav Stolz and Dr. Herbert Warren are participating as teachers in a continued education course for petroleum engineer twice monthly in Billings.

The Billings section of the Society of Petroleum Engineers of A.I.M.E. is sponsoring the continued education course for the practicing engineers.

Dean Stolz has given talks on reservoir rock and Dr. Warren talked about fluid flow. These talks are being given in three hour sections every first and third Friday nights of the month. A portion of the material covered included "Balance Method of Reservoir Calculations."

Math and computer teachers from the Billings area are also conducting classes there.

Professor Herndon has study published

Charles L. Herndon, Assistant Professor in the department of Engineering Science at Montana Tech and a mechanical engineer, presented the results of three years of research on air curtains in an article appearing in the May, 1966 issue of "HEATING, PIPING AND AIR CONDITIONING". The air curtain is a special blower that directs a moving sheet of air across the doorway of a building. The sheet of air allows unrestricted traffic through a continuously open door with very little heat and air exchange between the inside and outside of the building.

Talks are given in Geophysics Club

At a recent Geophysics Club meeting, Steve Bauer presented a discussion on induced polarization (I. P.). In this geophysical method, an electric current is fed into the ground between two electrodes. If If metallic ore is in the ground, it is charged up like a capaciter. When the current is turned off, a voltage can still be measured as these "ore condensers" discharge. Thus, the rate of voltage decay can indicate the presence of ore. To illustrate the value of this relatively new method, several field examples were discussed.

Geophysics Club meetings, open to anyone interested in the broad field of geophysics, are held every Wednesday afternoon at 4:15 in room 207 of the Physics Building. Speakers include students of geophysical engineering and faculty mtmbers. The meetings are supervised by John Marshall, Assistant Professor of Geophysics.

At an earlier meeting, Bob Heaphy explained the work he, Gary Dun, and Professor Marshall did using the school's recently acquired seismic truck and a gravity meter. They spent part of the past summer attempting to trace the bottom of the alluvium which covers the Butte valley. At the time of the presentation, not all values had been completed, but a few results could be discussed and some general trends shown.

In the following meetings, Bob Miller spoke on the possible causes of paleomagnetism while Gary Dahl showed how it might help indicate geologic periods. Current studies and evidence indicate that not only have the earth's magnetic poles wandered in the past, but they have reversed positions many times. It is believed that magnetic particles, deposited in sediments, aligned themselves with the earth's magnetic field before being permanetly bound. Therefore, a study of their present alignment may indicate where they were originally deposited. However, this requires the knowledge of where the magnetic poles were at the time of deposition. Work is now being carried out around the world to obtain this information.

Rotary Foundation announces fellowships

The Rotary Foundation of Rotary International is offering Rotary Foundation Fellowships for International Understanding for the academic year 1968-69. These fellowships provide full transportation, educational expenses, and also living and other miscellaneous expenses for the one academic year. In some cases, expenses will also pay for a period of intensive language training before the beginning of the academic year. These awards are made for study in any field and are maintained in more than 130 countries where Rotary clubs are established.

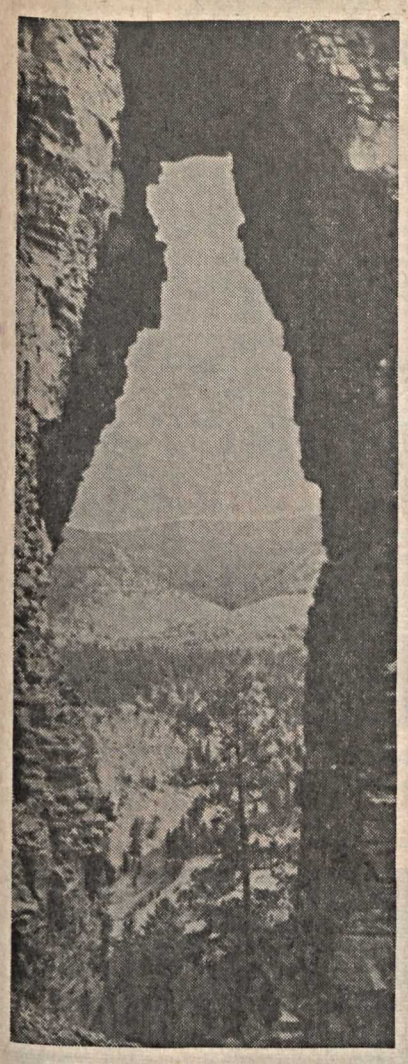
Applications for these fellowships should be made through the Rotary club nearest the entrant's residence no later than March 15, 1967. The winners of these awards will be announced in September, 1967.

In order to be eligible for these fellowships, the applicant must meet several requirements, a list of which has been posted on the bulletin boards on campus.

Further information is also available to those interested by contacting either Dean Stolz at his office, room 102 in the Engineering Building, or Mr. Sahinen at his office, room 204-A in Main Htll.

"Leisure is the dream-time of doing nothing spun by the many who stay on the wrong job."

—Dagobert Runes



This interesting picture of one of two natural birdges was taken by Don Hruska.

Students describe natural bridges

Don Hruska and his field assistant, Henry McClernan, students at Montana Tech, have described two spectacular natural bridges in the Smith River Valley of western Meagher County.

Hruska and McClernan were measuring stratigraphic sections of Lodgepole limestone in the Dry Range area this summer when they observed the two bridges. Don Hruska believes the 265 million-year-old limestone was subjected to differential erosion, which removed the solid rock from two sides until only a narrow sliver remained. At this time animals were able to burrow a hole completely through the sliver. Subsequent erosion has then enlarged the hole to its present size.

Both bridges have been known to local residents for many years, but there has been little or no publicity concerning them. The bridges are near the junction of Ellis Canyon and Rock Creek in the Dry Range.

Hruska and McClernan were engaged in geological research in the Smith River Valley as part of a cooperative project of the Anaconda Company and the Montana Bureau of Mines and Geology under the direction of Dr. S. L. Groff, Chief of the Ground Water and Mineral Fuels Division of the bureau.

Professor involved in space effort

Professor John McCaslin attended a N.S.E.E. NASA Fellowship seminar last summer for ten weeks. The program, which introduced the professors to the NASA program, is held in four ten-week sessions and is held to acquaint our teachers with the space project and to obtain their help in major problems.

Each professor at the seminar was assigned to a group. Professor McCaslin was assigned to geophysics, and every morning the groups went to two hour lectures. One of the most notable lecturers was Dr. Harold Urey, a nobel prize winner, who has written several books about the moon.

The problem assigned to the professors in geophysics was that of measurements and maps to be made of both sides of the moon from pictures taken from a Lunar orbit. Spectral analysis had to be made from infrared to ultra violet light which included photography of heat. The major problem was that NASA has had no experience in taking pictures in this way in anything other than the earth's atmosphere.

Professor McCaslin firmly believes in the present space program. He said that the country as a whole needs a common goal, and secondly he stated that with the research involved it will give a much greater return than is most commonly expected. "Already," stated Professor McCaslin, "blood pressure problems have made great headway as far as scientists being closer to total knowledge of the heart and circulatory systems are involved." Teflon is another direct result of space research.

Professor McCaslin has been invited to attend the NASA Fellowship seminar again next summer.

Professors John McCaslin and William Van Matre look at a section of a fourteen foot moon map to be mounted in the Physics-Petroleum Building.

Council holds meeting

President Henry Scholz called the Student Council meeting of January 9, to order in room 107 in the Student Union Building at 7:05 p.m.

The first business conducted was the voting of January 11. A member of the council and a professor were selected to conduct the election for each hour.

Necessary funds were appropriated to the Anderson-Carlisle association for E-Days.

Dean Stolz asked for some application forms for Student Managers of the Student Union Building.

A financial report was given by Mr. Burt on the general fund. He said it was slowly depreciating and it was only to be used as an emergency fund.

The meeting was adjourned at 9:03 p.m.

"QUIT WORRIN' ABOUT WHAT KIND OF A COURSE IT IS! WITH A LINE THIS LONG IT MUST BE A 'SNAP!'"

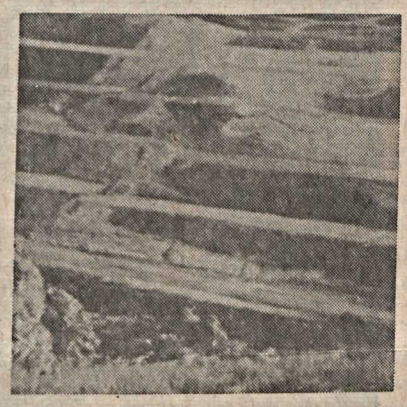
Scholarship offered to engineering girls

The Lillian Moller Gilbreth Engineering Scholarship of $500 will be awarded by the Society of Women Engineers to a qualified and deserving woman engineering student for use in her third, fourth, or fifth year of undergraduate study in a regionally accredited engineering school.

To be eligible applicants must meet the following requirements:

1) To be a woman enrolled in good standing in an engineering curriculum leading to a first degree in engineering in a school accredited by a regional accrediting association.
2) Be in a position to furnish an official transcript showing an overall grade point average of no less than 3.2 out of a possible 4.0 or equivalent.
3) Submit official and complete application for scholarship on or before February 1st, this February to preceed the September in which the recipient will use the scholarship.

The applications will be judged by a committee of five engineers, not connected with any school, and representing different fields of engineering. The recipient will be notified about May 1, 1967, and will receive the award in two checks of $250 each; one by September 15, 1967, and the other other by January 15, 1967.



The displaced road benches shown above are the result of an earthflow that threatens Interstate 91, southwest of Dillon.

(Photo by Dr. Dresser)

Earthflow studied by Tech group

On December 30, 1966, thirteen Montana Tech students and faculty members went to an earthflow site southwest of Dillon. Dick Mathews, a geologist from the State Highway Department, accompanied them to point out the more important features of the area.

Construction of Interstate 91 in the area has truncated the front of a series of slides that are now slowly flowing towards the highway. Means of stopping or restricting the slide were discussed and aerial photographs and cross sections of it were shown.

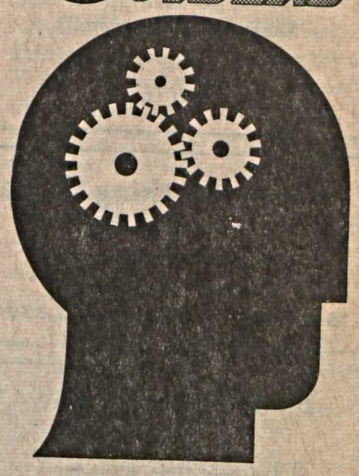
Alumnus earns doctorate

Robert E. Johnson, a 1962 graduate of Montana Tech, has recently been granted a doctor's degree in metallurgy from Pennsylvania State University.

While here, Johnson was one of the first two winners of Anaconda Company scholarships.

After his graduating from Montana Tech, he studied at the Mox Planck Institute in Goettingen, Germany, prior to his entering Pennsylvania State.

He has now accepted a position as post-doctoral fellow at the same university.



Tech's basketball squad consists of (front row, left to right): Richard Kloppel, Rick Gunn, Carl Pack, Jim Liefer, Ed Nordquist, Lee Steiger, Bob Chew; (back row, left to right): John McEnaney, Jack Humphrey, Gary Carlson, Pat O'Brien, Ron Koehler, Rick Rule, and John Sutey.

Tech loses two basketball games to Carroll College

Tech's driving and rigorous ball playing could not break Carroll's half court press in the January 7 game. If Tech did break through the press, a tight zone defense usually tied the team up.

During the course of the game, it seemed as though Tech could never get in contention with Carroll which led 45-27 at the half.

Score by periods: first half was Carroll with 45 and Tech 27. For the second half Carroll gained 48, Tech made 18, for a total of 93 to 45.

High point man for Tech was Ed Norquist with 10 points. Following him was Jack Humphery with 8 points. Gary Carlson, Pat O'Brien, and Jim Leifer each made 7 points.

On the night of January 17, Montana Tech met the Carroll College Saints, for Carroll's eighth straight basketball victory. The game was played in Helena with a decisive 105-65 victory, Caroll over Tech.

In basketball like in any other sport, it is not just winning the game that counts. Although Tech did not win, the players did a very fine job of playing the game. Because of this Coach Lester is very proud of his team.

The over-all high scorer for the game was Tech's John McEnaney with 17 points, followed by Gary Carlson with 15 points.

Volleyball and handball to be offered

Intramural volleyball will be offered to those who are interested after the start of the second semester in early February. Those who wish to participate are to turn in their team names and lists of players to coach Lester as soon as possible.

A maximum number of teams will not be set and both men and women may participate in a mixed team or in teams of their own.

The games will be held in the gym and will probably be played on Monday, Tuesday, and Wednesday. The length of the games will depend upon how many teams are entered. They will be under the supervision of coach Lester.

Two games should be played on each of the above mentioned days with necessary equipment being furnished by the school.

A tournament will also be played with the top four teams participating.

Intramural handball will also be offered with single and double tournaments to be held at a given date.

Those who wish to participate are to sign up in coach Lester's office, located in the gym.

Any further information on the two intramural sports may be obtained from coach Lester.

Tech meets Northern, Western

The Western Montana Bulldogs, coming through with a late surge, went on to defeat Montana Tech's Orediggers 83-47, January 10 in Frontier Conference action.

The loss set Tech back with a 0-2 in conference play and a 2-2 in season play. For Western, the win placed them with a 2-0 in conference and a 7-10 in season play.

Western's Gary Warhank was the high scorer of the game netting 28. Also scoring in double figures for Westtrn were Robinson, 11; M. Griffin, 17; and Cambpbell, 12. Leading Tech was Ed Nordquist with 13, double figure scorers were Humphrey 11; and Carlson 10.

Tech seemed well matched against Western at the beginning of the game, but as the game continued the Bulldogs were in full control. Western hit 37 out of 83 field attempts and 9 out of 17 free throws. Tech hit 17 from 72 field attempts and connected with 13 out of 21 at the charity line.

On the night of January 16, Montana Tech met Northern Montana College on the floor of Tech's gym. Montana Tech was aiming to put out the Northern Lights. At first Tech took a 9-2 lead, which was overcome by the Lights. The wide margin of score, which was 103-62, in favor of Northern did not block out the fact that this was an exciting game.

The Orediggers were hampered by the absence of 6'6" center Pat O'Brien, who twisted his ankle in the Tech-Western game a week ago and was not sufficiently recovered to play.

Gary Carlson was high point man for Tech with 17 points. Following Gary in points was Jack Humphery with 15 points and Ed Norquist with 10 points.

In the score by periods; first period Tech had 29, Northern made 45. The second period saw Tech make 33 more points and Northern 58, for a total of 62 for Tech and 103 for Northern.

Ed Norquist, going up for 2 while Carroll goes on to defeat Tech.