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Associated Students of the Montana State School of Mines

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DATE GARDNER FINDS MINES' TRAINING USEFUL

Graduate of 1911 Is Owner of Large Date Gardens

"My engineers' training has been of a great help to me in my present undertaking," states Mr. Shields, Mines graduate of 1911, well known date grower and owner of Shields' Date Gardens, Coachella Valley, Indio, Calif.

"In our garden of 119 kinds of dates, each as different from the other as 119 people that you have known or seen, we have the Shields' Black Beauty, a large black date that brings 5 cents apiece for each date. We only sell one date a year to each person who must come to the garden to claim it. When one bold visitor, a woman, tried to get an extra date by stealing it, it became necessary to use bodily force to make her surrender the same," said Mr. Shields.

Great care must be taken in the process of reproduction. The male palm does not bear fruit, but produces blossoms that furnish the pollen used to fertilize the female blossoms. These blossoms are cut off the morning they open up, dried, and the pollen shaken out and collected on cotton bolls like powder puffs.

Nature made no adequate provision for transferring the pollen from the male blossoms to the female bloom.

The collected pollen must be dusted by hand on the female bloom the first, or three to four days after it has opened. The female palm will have from 8 to 20 blossoms and will produce from 100 to 350 pounds of fruit, depending on the palm and the care it has received.

The dates on a cluster do not ripen at the same time so they must be picked one at a time. They cannot be cut like bananas in a bunch.

JUNIORS BEGIN ANNUAL

Staff for Student Year Book Is Named

The Junior Class has made an early start in gathering material for the Annual. It is our endeavor to publish a book that will be a credit to the school and one which will differ considerably from the foregoing issues. We are working under the assumption that many persons derive from the book their only impression of the School of Mines and they will certainly look through it with more care and interest than would be devoted to even the school catalog.

There have been many persons selected to submit contributions in order that the written material may be representative of the entire student body and faculty. The persons on the staff...

(Continued on Page 2.)

A. M. GAUDDIN

Who, July 1, became Research Professor of Ore Dressing

Although a comparatively young man, Professor Gaudin has already won nation-wide recognition as a leader in the field of investigating the fundamentals of the flotation concentration process. He received his preliminary education at the Lycees of Versailles and of Tournon, and received his Baccalaurale degree from the Universities of Paris and Aix.

Subsequently he was a graduate student at Columbia College, New York, and received his Engineer's degree from Columbia School of Mines. Professor Gaudin for two years lectured in Ore Dressing at Columbia University, and was also associated with Taggart and Yeuka, consulting engineers of New Haven, Conn., as research engineer in connection with the flotation, flotation involving the Miami Copper Company and the Butter and Superior Company against the Minerals separation companies. Previous to his coming to the School of Mines last summer, Professor Gaudin was a member of the faculty of the University of Utah as Associate Professor of Metallurgy Research, in which capacity he served for three years.

TECHNICAL LECTURE IS GIVEN IN ANACONDA

Speeches are Dr. F. A. Thompson, Mr. Frank Cole and Mr. Bayard S. Morrow

One of the series of technical lectures usually held at the School of Mines was held on November 26 at the Montana Hotel in Anaconda in conjunction with a dinner and meeting of the Montana chapter of the American Institute of Mining and Metallurgical Engineers.

The speakers were: Dr. Francis A. Thomson, president of the School of Mines; Frank Cole, superintendent of the phosphate plant of the Anaconda Company; and Bayard S. Morrow, superintendent of the concentrating plant of the Anaconda Company.

Dr. Thomson spoke on "The Mineral Industry and the Public Domain," the contents of which will be published in the next issue of the Acropolitan.

Frank Cole spoke on "The Present Status of the Phosphate Industry in the Western United States." He stated that present figures show that the use of phosphate fertilizer in the western states is on a steady increase. The bulk of the phosphate put on the market as phosphoric acid and phosphates of calcium and ammonium is supplied by Florida and Tennessee; with the western states, Utah, Montana and Wyoming supplying a minor amount from some 12 operating underground mines. The chief by-product, calcium sulphate, is wasted, Mr. Cole stated, as there is practically no demand for this product in the West. Vanadium, another by-product, is present in such small amounts that it can not be produced on a commercial scale.

Bayard S. Morrow discussed "Recent Developments in Concentrator Practices" in which he compared the old gravity method concentration with the more modern methods by selective flotation. "Finer grinding and flotation made it possible," he said, "to separate sphalerite and galena, and the copper sulphides from pyrite. The problem presenting itself is not the separation of the sulphide from the gangue, but rather the separation of the sulphides from one another, which is partly made possible through a finer grinding of the ore. There is a limit, however, to the degree of fineness that an ore may be ground," stated Mr. Morrow, "the coarse should be ground finer and the fine coarser, so that a maximum recovery may be made."
The Ore Dressing
Dept. at M. S. S. M.

By A. M. GAUDETIN.

Ore dressing is referred to under a number of names, such as milling, concentration, and ore dressing. In University catalogues it is usually referred to as "ore dressing" and classified as a course in mining. This is perhaps the reason why when I was a student, and before I came to the course, I assumed that it consisted in trimming specimen corners for showcase purposes. However, soon after I began taking the course I realized it was no such plaything, but rather a case of an application of all the mechanics, physics and chemistry that I had at my command.

It is interesting to outline the marked evolution that has taken place in ore dressing in the course of the last quarter of a century. Up to that time it consisted essentially in applying certain differences in density between minerals to cause a sorting of the mineral grains, thereby making a separation possible. The operation of the mill, in those days, was largely a case of fighting mechanical imperfections, there being little required of the millman outside of the gloriety of a millwright.

Today ore dressing is essentially applied chemical engineering and applied physical chemistry. The change has been so vast that the old type millmen are out of a job and the demand for millmen properly trained in the modern version of the art can hardly be filled.

The personnel of the ore dressing department consists of the instructor and two graduate students, Messrs. Groh and Henderson. Groh is president of the student body, as is no doubt known to all the readers, and Henderson has come to the School of Mines from the University of California, where his record has been one of outstanding achievement. Both Groh and Henderson are living up to their reputation in their work in ore dressing.

The equipment of the department is not as yet completed but it can make a very creditable showing already. The equipment consists largely of borrowed microscopes, borrowed table, and also of a few pieces of strictly ore-dressing machinery that had to be purchased.

Anyone who is interested in the rather technical apparatus is invited to come and look it over and not be afraid to ask questions concerning it.

As an indication of the sort of problems that is presently facing the millman the following might be indicated. In order to be able to concentrate an ore, that is, to gather the valuable constituents of it in one or several valuable products and to reject the worthless constituents in another, it is necessary to break the bonds between disimilar grains; this is generally referred to as "liberation." Figure 1 is a photograph of a grain zinc blende magnified about 100 times, in which may be seen innumerable qualities of tiny chalcopyrite grains which are so small as to make it economically impossible to separate from the sphalerite. Of course, in most ores these are milled today the aggregation of the copper, zinc, lead and iron minerals is nowhere nearly as intimate as it is in the case shown in Figure 1 or else it would not be possible to concentrate them economically at the present time. However, it must be stated that tremendous strides have been achieved in this line in the last few years, the possibility of crushing an ore to such a stage that all the grains are finer than 1-500 of an inch being regarded today as not as impractical whereas 25 years ago the grinding of an ore so that all of the grains would pass 1-100 of an inch was regarded as the limit.

Figure 2 is an illustration of the type of effect that is responsible for the marvelous separations between minerals that can be accomplished by the flotation process. Flotation was invented, so it is said, by a woman. She was a school teacher who, in those old fashioned days, prided herself on her husband's overalls. He was a miner or mine foreman of some sort and accumulated upon his clothes a quantity of finely pulverized ore particles. Upon washing the clothes she noticed that the soap foam produced carried the values whereas the dirt stayed in the water; so, Carrie Everson took a patent which was not worth anything to her at the time because the people were not ready to accept such a radical change in their ideas. This was about 50 years ago; for 20 years Carriere Everson's idea lay dormant until it was rediscovered in an improved form in England and applied in the United States and Australia. Since that day flotation has been improving practice, saving tremendous sums of money.

Fig. 1—Grain Zinc Blende

Fig. 2—Malachite Contour With Copper Xanthate

GRADUATES OF THE MONTANA SCHOOL OF MINES, CLASS OF '29

Oakley B. Gwilliam, assistant geologist, Manitoba Basin Mining company, The Pas, Manitoba, Canada.

John J. McCarthy junior engineer, Butte Consolidated Mining company, Ray, Arizona.

Claude C. Mongold, assistant engineer, East Butte Copper Mining company, Butte, Montana.

uno M. Salamon, assistant engineer, North Butte Mining company, Butte, Montana.

Marcus McCanna, A. C. M. mechanical engineering department, Butte, Montana.

Harold Murphy, Denver Rock Drill company, New York, N. Y.

Frank Moran, ore dressing works, Great Falls, Montana.

Wm. G. Moore, Mine Sampler, Anaconda mine, Butte, Montana.

Robert Perry, Andes Copper company, Porterville, Chile.

Norman Thompson, Ardenel-Butte Mining company, Butte, Montana.

Jacob Brunner, St. Joe Lead company, Hughesville, Montana.

Earl Lindley, graduate Fellow in metallurgy, Montana School of Mines, Butte, Montana.

Clarence Corry, Sampler, A. C. M. company Butte, Montana.


James A. Clark, assay engineer, Anaconda mine, Butte, Montana.

Albert LeBel, assay engineer, Anaconda mine, Butte, Montana.

The Ore Dressing - a plate showing a photograph of a grain of zinc blende magnified about 200 times, in which may be seen innumerable qualities of tiny chalcopyrite grains which are so small as to make it economically impossible to separate from the sphalerite. Of course, in most ores these are milled today the aggregation of the copper, zinc, lead and iron minerals is nowhere nearly as intimate as it is in the case shown in Figure 1 or else it would not be possible to concentrate them economically at the present time. However, it must be stated that tremendous strides have been achieved in this line in the last few years, the possibility of crushing an ore to such a stage that all the grains are finer than 1-500 of an inch being regarded today as not as impractical whereas 25 years ago the grinding of an ore so that all of the grains would pass 1-100 of an inch was regarded as the limit.

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Shirley Clothes Shop
14 NORTH MAIN ST.
Suits and Overcoats for Men and Young Men
$20, $25 and $30

Shirley Clothes Shop
14 NORTH MAIN ST.
FOOTBALL IS REVIEWED

(Continued from Page 1.)
spreading punts but it remained for MacFarland to give the co-eds a heart
ache by escorting a certain little red
head to the dance that evening and de-
manding the first 17 dances with her.
October 25, the Orediggers went by 
bus to Helena where they played Inter-
mountain Union college. Ratz and 
Culver of Intermountain were too much 
for the Miners and the boys lost 15-6. 
MacFarland took a long pass for a 
touchdown and won the game by taking passes for long gains that put 
the ball in scoring positions on two 
more occasions. After the game, the 
boys almost put the school in bank-
ruptcy by eating 24 of the biggest 
steaks that ever were carved out of an 
ox.
November 2, the Miners played Weber 
college at Ogden, Utah. Weber, smar-
ting under a defeat by McKinley school 
and the blow of having several of their 
regulars declared ineligible, played over 
their heads and scored two touchdowns 
in the first few minutes of play, a lead 
that could not be overcome. Head car-
rried the ball the length of the field in 
the final quarter for one touchdown 
and again led a march that ended with 
the final gun on Weber's five-
yard line.
The Orediggers wound up the season 
against the Wolf Pack of the University at Clark 
park. November 9. The Miners played the Cubs off their feet and won, 6-0. 
In this game Ryan and Rodlin played 
their last games for the Mines; and al-
though MacFarland has a husky squad 
for next year, their places will be hard to fill.

JUNIORS BEGIN ANNUAL

(Continued from Page 1.)
are those who have charge of a defi-
nite department of the annual and the 
selection thus far is:
A. H. Englehardt
Cailen Vandell
Eugene Little
Harold Johnson
James McCourt and Stanley Williams
Arthur Wilson
Leroy Mallock
Bess Wallace and Margaret Kelly
Forest Majors
Roy MacFarland
While the publication of the year 
book is entrusted to the Junior Class as a 
whole, we wish that the student body 
would realize that the book reflects the 
interest shown by them.
If you have a good joke in mind, a 
piece of poetry or an idea which might 
be worked up into an attractive page, 
do not fail to bring it in even though 
it may require considerable work to 
do it presentable. If that takes too 
much time, drop your contribution in 
the box at the corner of the annual 
ofice.
We hope that the product of our 
efforts will be in accordance with your 
ideas of what the book should be 
and that each year will find an increased 
desire of the class in charge to im-
prove upon the work of the preceding 
year.

LEAD, A BASE METAL OF HIGH
IDEALS

By Dr. Curtis L. Wilson, '20.
Back in the days of Solomon, when 
a man could have a thousand wives 
and still enjoy a reputation for wisdom, 
gold and silver were considered the 
same of nobility and purity, while 
the other metals were relegated to sub-
dominate positions, in the rank of nier-
ism. It is evident that this point is easily 
proven upon the work of the prece-
eding English Prof.

J.B. Hagel
J.J. Ginney
L.F. King

Society can they smash one into bits with a 
chisel all day long without securing 
any visible dents.
Upon this peculiar combination 
of softness and toughness depends the 
rather unexpected usefulness of lead 
for hammers, anvils, and vises, used by 
jewelers and automobile mechanics for 
shaping silverware and automobile fenders. The most delicate tools are made 
of lead for jewelers' use, and their 
vises have lead-lined jaws, because the soft-
ness and toughness of the metal enable 
the craftsman to fashion exquisitely 
formed gold and silver plate without 
fear of marcing his handwork. For the 
same reason, the automobile mechanic 
and others working in sheet metal use 
heavy hammers made of lead, which 
leave no disfiguring dents.
The modest properties of lead fur-
ish an excellent example of the ideal 
manner in which a metal may serve 
us, if we but recognize its properties and 
utilize them correctly. The example, 
an unassuming one, is the fuse in an 
electrical circuit, called "fuse" because 
it is made of easily fusible lead, or 
one of its alloys. It is merely a short 
section of the circuit serving as a safety 
valve to prevent an overload of cur-
rent. A sudden overload of current 
might happen almost any time from 
shorting circuits, and other acci-

dents, and such excessive current, gen-
erating as it does a large amount of 
heat, might melt the wires, damage ex-

densive electrical apparatus, and cause 
fire. The fuse acts as a martyr in this 
case, causes the heat to be generated 
in itself, melts, and breaks the circuit, 
thus saving more valuable things from 
the outside circuit.

A fuse, presented thus merely a short 
piece of fusible lead, is a useful device 
in the hands of the craftsman, to fashion exquisitely number 
so a 
metal. Lead is the cheapest of metals, and can be easily 
cast in any place. The fuse serves as a Jack of all trades, and has 
merely used a pencil for writing on it.

paper. The "lead" used in our present-
day pencils is graphite. However, not 
the metal. Although so very soft, it 
is nevertheless the toughest of all metals. It is merely' a short'
input to the dance'
BE YOURSELF

"Be yourself" is the urge of the moderns who frankly believe that they are "being themselves." But are they? Can anyone be himself in company with others? Not if to be oneself is to give full sway to every impulse no matter what effect it has on others. The following through of every impulse would necessitate the disregard of rules of social conduct. For instance: If a man should slap a woman across the face because he has the desire to (and I think many a man has had the desire!), he would be himself no doubt, but he would be no gentleman. If he should have the impulse to tell his employer where to "head in," he may be himself and do so; but where will it get him? Every man has a million and one impulses which he will not allow himself to put into action. As long as he has to associate with men he is going to follow their code of laws. He will be civilized as they are. He will refrain from doing what he wants to do when he wants to do it. He will not be himself!

ORE DRESSING RESEARCH

The creation of the Development of Research in Ore Dressing is the first research department established at the School of Mines, and is in line with the policy which the State Board of Education desires to have fulfilled, of making the Montana School of Mines one of the outstanding research institutions of the country, so far as the mineral industry is concerned.

Considering Butte as the backbone of the mineral industries of Montana, the School of Mines is the logical place to carry on research of this nature.

In our present day, laboratory experiments and the testing of new theories, with various ideas and processes, are considered necessary to a process of recovering the values, as the discovery of new ore bodies. It can be said that the success of a mining enterprise will be predicted or even estimated by the amount of research carried on. We need no farther than the Anaconda Copper Mining Company which has spent millions of dollars on research. A leader in research and a leader in the copper industry—the two go hand in hand.

After lying dormant for over 10 years, and though far from being fully

CONCERNING THE DANCING CLUB.

The primary object of the Dancing club is to assure social diversion so necessary to the students and to maintain school spirit by closer contact with fellow students. The club is one of the oldest and most active organizations on the campus.

The president, Gene Little; vice president, Lee Voorge, and secretary-treasurer, Wes Wallace, were elected by the school at large at the first meeting of the A.S.M. Representatives elected by the classes make up the remainder of the club.

The dances given this year so far were held in the Engineering building as usual. The Rush Day dance was a most enjoyable informal dance, and as it was the first the majority of the students were there. We hope to give many more like it before the year is over.

modern American university. The miner under ground, shutting off the roar of his "Vaugh," the mill or smelter laborer, leaning on his shovel, will argue for a college education as a way of getting into the mining graduate in the shift boss rut or the inefficient assistant superintendent who possesses "pull." They never mention the Roovers and the graduate, the man who has had a run of clean-cut, intelligent, well-paid, far-traveled, wide-visioned gentlemen mining engineers, which I, for one, hope and believe exist.

The general public seems to be de- ceived by a slightly suspicion of attitude towards colleges and college students. The business men no longer, if ever, open their purses to "deserving young men." I know of no friend of mine who ever borrowed a penny to get through school. They have had parental aid or they have worked, and worked hard, in lumber camps, boiler works, factories, mines, smelters. These men, having fought their own way, have done as well with a practical knowledge of mining and a degree in salesmanship. The third certainly would be, for the present, better off educationally if he had stayed in one place and stuck to one thing; he has the qualities of a keen business man. It is impossible to judge the value of technical training to these three engineers because of their youth, but the paths they have followed to date tend to make the observation of high school graduates who are thinking of higher education. Then, too, what part has "pull" or "luck" played in their respective careers?

I am further confused by the educational hodge-podge made up by the student activities of members of my family. Some of the institutions represented are West Point, Freiberg (Germany), University of Washington, University of Pennsylvania, University of Sydney (Australia), Pennsylvania Academy of the Fine Arts, Virginia Military Institute, Manhattanville convent, St. Andrews' (Scotland) and others. The results of this variety are interesting and astonishing and too complicated to write about here.

Also, any boy professor will urge almost any young man to attend college, although Dean Nickols of Harvard recently asserted that the artisan, the artist, the pure scholar and the adventurer should be rigidly excluded from the equipped as yet, having only been in existence for a few months, the research department has already won recognition as one of the most successful in the country. But the superintendent of the concentrating plant of the Anaconda company. In his recent address to the American Institute of Mining and Metallurgical Engineers he complimented Professor Caudin on the splendid research work carried on at the School of Mines. He stated that work had been done at the school that could not be done in Anaconda.

A. S. M. Sends Representative to Chamber of Commerce Meetings

At a recent meeting of the A.S.M. it was voted that the student body become a member of the Butte Chamber of Commerce, thereby bringing the A.S.M. in closer contact with that organization in matters of mutual concern.

Harold Johns was elected by a large majority as the representative of the student body at the Chamber of Commerce meetings.

JUNIOR CLASS NOTES

Everyone is agreed that the Junior class is the greatest little class that ever came over the pike. Anyone doubting this has just to ask the Juniors. We also had the distinction of not being altogether made up of the male sex. The sum total of two co-eds in our midst.

Very shortly after the routine of school had gotten into full swing the class called a meeting and decided that we should have some dances that would be fitting a hard-boiled bunch of miners. The proverbial Steaton was chosen as which that would which us from the rest of the "common herd." It was also discovered at this time that there were represented in the Junior class about 75 different nationalities (if there are that many), ranging all the way from Stanly, the Jew, to "Ginger" the Swede, though all our boys are quite proud of them; ask them and see.

Right off the bat we enrolled 100 per cent for O. A. Dieting's team. This bodie tends to be quite a contest, and the process of elimination is likely to take place sooner than we expected. We have merged from the first scrimmage with a batting average of .50. (No grandstand plays allowed, boys.)

To those of us who have had some lovely weather for vacationing and Dr. Perry's class in petrology has certainly taken advantage of this, wandering around over the hills in search of "whir canny bobs" and "gassy lumps," "whir canny bobs" and "gassy lumps," "whir canny bobs" and "gassy lumps," "whir canny bobs" and "gassy lumps," "whir canny bobs" and "gassy lumps," "whir canny bobs" and "gassy lumps," "whir canny bobs" and "gassy lumps," "whir canny bobs" and "gassy lumps," "whir canny bobs" and "gassy lumps," "whir canny bobs" and "gassy lumps," "whir canny bobs" and "gassy lumps," "whir canny bobs" and "gassy lumps," "whir canny bobs" and "gassy lumps," "whir canny bobs" and "gassy lumps," "whir canny bobs" and "gassy lumps," "whir canny bobs" and "gassy lumps," "whir canny bobs" and "gassy lumps," "whir canny bobs" and "gassy lumps," "whir canny bobs" and "gassy lumps," "whir canny bobs" and "gassy lumps," "whir canny bobs" and "gassy lumps," "whir canny bobs" and "gassy lumps," "whir canny bobs" and "gassy lumps," "whir canny bobs" and "gassy lumps," "whir canny bobs" and "gassy lumps," "whir canny bobs" and "gassy lumps," "whir canny bobs" and "gassy lumps," "whir canny bobs" and "gassy lumps," "whir canny bobs" and "gassy lumps," "whir canny bobs" and "gassy lumps," "whir canny bobs" and "gassy lumps," "whir canny bobs" and "gassy lumps," "whir canny bobs" and "gassy lumps," "whir canny bobs" and "gassy lumps," "whir canny bobs" and "gassy lumps," "whir canny bobs" and "gassy lumps," "whir canny bobs" and "gassy lumps," "whir canny bobs" and "gassy lumps," "whir canny bobs" and "gassy lumps," "whir canny bobs" and "gassy lumps," "whir canny bobs" and "gassy lumps," "whir canny bobs" and "gassy lumps," "whir canny bobs" and "gassy lumps," "whir canny bobs" and "gassy lumps," "whir canny bobs" and "gassy lumps," "whir canny bobs" and "gassy lumps," "whir canny bobs" and "gassy lumps," "whir canny bobs" and "gassy lumps," "whir canny bobs" and "gassy lumps," "whir canny bobs" and "gassy lumps," "whir canny bobs" and "gassy lumps," "whir canny bobs" and "gassy lumps," "whir canny bobs" and "gassy lumps," "whir canny bobs" and "gassy lumps," "whir canny bobs" and "gassy lumps," "whir canny bobs" and "gassy lumps," "whir canny bobs" and "gassy lumps," "whir canny bobs" and "gassy lumps," "whir canny bobs" and "gassy lumps," "whir canny bobs" and "gassy lumps," "whir canny bobs" and "gassy lumps," "whir canny bobs" and "gassy lumps," "whir canny bobs" and "gassy lumps," "whir canny bobs" and "gassy lumps," "whir canny bobs" and "gassy lumps," "whir canny bobs" and "gassy lumps," "whir canny bobs" and "gassy lumps," "whir canny bobs" and "gassy lumps," "whir canny bobs" and "gassy lumps," "whir canny bobs" and "gassy lumps," "whir canny bobs" and "gassy lumps," "whir canny bobs" and "gassy lumps," "whir canny bobs" and "gassy lumps," "whir canny bobs" and "gassy lumps," "whir canny bobs" and "gassy lumps," "whir canny bobs" and "gassy lumps," "whir canny bobs" and "gassy lumps," "whir canny bobs" and "gassy lumps," "whir canny bobs" and "gassy lumps," "whir canny bobs" and "gassy lumps," "whir canny bobs" and "gasy
FEDERAL CIVIL SERVICE ANNOUNCES EXAMINATIONS

The United States Civil Service Commission announces the following open competitive examinations:

Under laboratory apprentice, $1,500 a year.

Minor laboratory apprentice, $1,050 a year.

Applications for under laboratory apprentice and minor laboratory apprentice must be on file with the Civil Service Commission at Washington, D.C., not later than December 31. The examinations are to fill vacancies in the departmental service, Washington, D.C., including the Bureau of Standards and in positions requiring similar qualifications.

Competitions will be rated on elementary physics or general chemistry, mathematics, mechanical drawing or easy, and on their education and experience.

Principal topographic draftsman $2,500 a year.

Senior topographic draftsman, $2,000 a year.

Topographic draftsman, $1,500 a year.

Assistent topographic draftsman $1,250 a year.

Junior topographic draftsman, $1,440 a year.

Applications for the above named positions must be on file with the Civil Service Commission at Washington, D.C., not later than December 18. The examinations are to fill vacancies in the departmental service, Washington, D.C., and in positions requiring similar qualifications throughout the United States.

Competitors will not be required to report for examination at any place, but will be rated on their education, experience and fitness and on topographic drawing and lettering.

Junior Chemist.

Applications for junior chemist must be on file with the Civil Service Commission at Washington, D.C., not later than January 31. The examination is to fill vacancies in the federal classified service in Washington, D.C., and in the field.

Students who desire to continue an optional subject. The optional subjects to do so, not only the universities of Washington, which arrange their class hours to suit the convenience of persons in the government service by giving courses in most subjects in late afternoon or evening, but, in addition, the departments themselves, in a number of cases, offer courses in advanced work which are given suitable credit by recognized colleges.

SOPHOMORE NOTES

On August 17, 1929, a group of young looking men gathered at the Northern Pacific depot, carrying rolls of blankets, competitive and other impediments, and climbed aboard a train, giving their destination as Pony, Mont. The group comprised the bulk of the Sophomore class, leaving for the annual field trip in plane surveying, under the direction of Professors Adami and McAllistair. The train conductor was heard to remark to someone that he had never seen such a wild bunch. However, he was right, as the gang were in fine spirits and didn’t care who knew it. On the arrival at Pony the boys immediately set to work at making camp. The first evening was spent at poker. The remainder of the evenings were spent in dottering notes so that they might pass the exacting eye of Professor Adami.

The days were spent in the field, adjusting instruments, running, traverses, leveling, taking visited shots, running the planes across the mountains, laying out their railroad and surveying. Most of the boys were glad to get back to Butte when the time came to leave.

Surveying over, the sophomores turned their attention to the reception to be given to the incoming freshmen. And what a reception. It consisted of taking the rope and let the freshmen pull away from the freshies, and then to add insult to injury, they proceed to tie up the most promising members of the Freshman class and drag them across the field. By this time the sophs were pretty warm, so when the tug of war came along, the sophs just held onto the rope and let the freshmen pull them through a nice cool stream of water issuing from a fire hose. If sure pegged up the sophs and they were ready for a big evening which they had at the mixer dance at 8 p.m.

At the first class meeting held, Ed Truworth was elected president, Theodore Rodlin, vice president, and E. Peter Cadwell secretary-treasurer. Johnson and Williams were elected to represent the class in the dancing club.

These formalities over, the gang set down to study. Life for a sophomore has turned out to be SOMETHING, a dance, and include all the members of the classes.

Good spirit was shown at the meetings held relating to the dancing, and the rest of the school can rest assured that it is going to be SOME party. Arrangements are trying to be made to afford a little outside entertainment for the crowd while the orchestra is "taking five."

In the inter-class basketball tournament the sophs have not been faring so well. The class placed two teams in the tournament and to date the only game which the sophs can say that they won was when the soph A team beat the B team. Won one and lost one, therefore 500 per cent. Watch their smoke after the Thanksgiving holidays.

There, there little grapefruit Don’t you cry It hits my eye.

Norris—What is a vacuum Hot Shot—I can’t say exactly, but it is in my head.

Chubbins: The doctor says I have to stop eating.

Anne: What?

Chubbins: Seven times a day.

What the One Fraternity of the Mines Has Been Doing

The Sigma Rho, well along in its fourth year at the School of Mines, started the year by pledging five members of the present sophomore class. We feel that these men will fully fill the gap left by the graduating members of last year. We are also very pleased to announce the membership of Dr. Curtis L. Wilson, head of the metallurgy department of this institution.

So far there have been two parties, one of which was the pledging party, a Lovely dinner at Medordville; the second was a party for pledges and faculty members held at Lipson’s Inn.

At present serious thought is being given to the initiation of the pledges, which will take place in the near future. Plans are also being made for the annual dance given by the Sigma Rho for the students of the school.

The fraternity has been very successful in aiding the advancement of school activities in the past, and it is hoped that it will be able to continue.

TEST RECIPE FOR "A" THEMES

1. Standard size head.
2. Oz. brains and common sense.
3. Sheets theme paper.
4. Bottle ink.
5. Pen.

Chop the dictionary into shreds, dibute shreds and theme paper in ink, boil for 15 minutes stirring constantly with pen, Cool and let jell. Slice head into cubes and have your educated uncle write the theme for you. Crane Technical High, Chicago.

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One part of the activities of the State Bureau of Mines and Geology was a survey made recently of the ground water of eastern Montana by Prof. K. S. Perry and Mr. John E. Blixt. Practically every county in the plains area of Montana was visited during the summer and between 400 and 500 flowing water wells were investigated. Many of these wells were small with flows of but a few gallons per minute; however, some were extraordinary in size. A couple of wells east of Bridger in Carbon county were estimated to have flows of between 75,000 and 100,000 barrels per day, and several others were observed which flowed over 10,000 barrels of water per day.

The water of these wells comes out of porous sandstone formations which are at depths of from 200 feet to over 2,000 feet. Considering the entire state, these water bearing sandstones occur at 12 or 15 different geological horizons, although at any one locality not over two or three water producing beds are commonly present. Certain of the sandstones are continuous below the surface across areas of perhaps two or three counties, and may be expected to furnish flowing water wells wherever drilled into. At least three of these general areas of large size are outlined over which flowing water wells could be predicted. In addition to these large areas several small areas were noted.

One of the big flowing wells mentioned in Carbon county, pictured above, is particularly interesting. At this place a drill hole was being sunk to test the locality for oil, and a typical oil well derrick was being used. At a depth of 500 feet the water horizon was encountered unexpectedly, and a 14-inch stream, which came gushing upward, suddenly flooded the derrick floor and sent the workmen scurrying to safety. The equipment at the well was not suited for controlling such a large flow of water, so pipe fittings were ordered and the drillers awaited their arrival.

However, nature didn’t wait for pipe fittings. The derrick had been erected on a rather level space where the soil was about 30 feet deep. The large flow of water began at once to wash away the soil, and in not many hours a gully had developed leading away from the drilling rig. The soft soil cut away rapidly and by the second day the gully was under the derrick carrying away foundations. The drillers, “soft job” of waiting turned into a desperate rush to save the derrick and drilling machinery. Boards and timbers began to fly and fortunately, due to rapid work, the machinery and derrick were saved, ending picture.

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ARGENTA MAPS AND REPORTS

(Continued from Page 6.)

a decision was reached to make a similar survey of the Argenta district. Accordingly Dr. Shenon was assigned to this work. He was assisted by Theodore Rodlin and John O'Connor.

Six weeks were spent in the region during the past summer. In this time topographic and geologic maps were made covering an area of 20 square miles and 2 mines and prospects were examined.

Rocks ranging in age from pre-Cambrian to recent are included in the area. The oldest rocks exposed are the Spokane shales. They are overlain by the Flathead quartzite which, in turn, is overlain by a thick series of Paleozoic limestone, quartzites, sandstones and shales. Higher still in the geologic column are the bench gravels. Two gravel were known to exist in the Flathead belt.

Investigation had been carried on terraces are well developed, the town of mountain range. A considerable amount be ready for publication next spring.

A beautiful developed glacial mor- previous to Dr. Clapp's by other eminent shears zones in quartzite. mother goat challenged the men while shear zones in quartzite. mother goat challenged the men while

The party consisted of four members, namely, Dr. C. H. Clapp, Mr. Megathlin, professor of Geology at the State University, Mr. Claude Laughton, a student at Missoula, and myself, a student in geology at the School of Mines. The main object of the investigation was to obtain an accurate correlation of the Belt series of this district and to explain some very complicated features of mountain-making processes that were known to exist in the Flathead mountain range. A considerable amount of investigation had been carried on previous to Dr. Clapp's by other eminent geologists, one of which was Roy Wilson.

In order that a suitable solution could be worked out to fit the requirements, two theories had to be considered; the correlation of the Glacier Park series with that of the Flathead range, and the system of faulting which had produced mountains. In order to collect the necessary information, several trips were taken to the Glacier Park and an area of approximately 5,000 square miles was mapped.

Among the valuable information gathered was my finding a Cambrian trilobite while examining a weathered outcrop of limestone. This fossil was the first of its kind to be found in Montana, although several searches have been made for it since 1923.

Frequently, wild animals of all kinds were encountered. One occasion which needs special comment was an experience Dr. Clapp and two of his assistants had with a mountain goat. The goat charged the men while on top of a narrow ridge with a 500-foot drop off on either side. The goat

The boys frequently overheard Dr. Shenon asking the cook how this or that was prepared—but the doctor was contemplating marriage. The contemplating had materialized and it looks as though it has not become necessary for him to put into practice the cook's theories. His advice now is, "Don't interfere with the cooking, but help wash the dishes and remain happy."

As a change of diet, "Dough" Rodlin, the crew's named, caught a fish. He says seven inches from top to tip, but then he may be exaggerating for the sake of emphasis, as Scott would put it.

For amusement nights, Shorty O'Connor would pick up the mouth harp and put up a good front, giving the men a few moments of excitement before they could persuade her that the invaders meant no harm to her or hers.

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LEAD, A BASE METAL

(Continued from Page 3.)

a wider range of usefulness than any other metal. While over half of the copper produced today goes into the electrical industry, and 90 per cent of the zinc is used for galvanizing and the manufacture of brass, and 60 per cent of the platinum goes into jewelry, lead distributes its services fairly and equally over a large number of fields. The largest amount, 24 per cent, is used for storage batteries; 19 per cent is used for cable coverings; 13 per cent for the manufacture of white lead paint, and 10 per cent in building construction. The remainder of the world’s production is divided in portions of from 3 to 4 per cent of the total for ammunition, solder, lead foil, bearing metal, red lead pigments, calking, type metal, castings, and other miscellaneous uses.

Although low in most of its physical properties lead is high in specific gravity, and because this property affords desired weight with minimum bulk, it has always been an indispensable material in the manufacture of ammunition. No other metal of equal cheapness or malleability can achieve under equal conditions the momentum of a lead bullet or lead shot. Steel is too light for the purpose. In making lead shot the molten metal is dropped from the top of a high tower into a tank of water at the bottom. The falling liquid particles assume a spherical form, just as the raindrops do, and solidity as such in the water bath. The correct fluidity is attained by alloying with a small percentage (0.5 per cent) of arsenic. The resulting shot are carefully graded and sized by screening. Sizes larger than 1/4-inch are cast. With the modern high explosive powder and high-powered rifle a pure lead bullet would be melted by the heat of the explosion or stripped by the sharp edge of the riffling, so the lead is partially or entirely covered with a jacket of steel or cupronickel.

In the manufacture of type metal containing over 80 per cent lead, the peculiar property of expanding slightly on solidifying is desired, in order that the metal may entirely fill the mold and insure sharpness and delicacy of line. Lead does not possess this quality when alone, so antimony and tin are added; by the addition of these metals both the sharpness and wearing qualities are improved. It might be of interest to mention that bismuth and gallium are the only two pure metals which expand on solidifying from the liquid state, that is, the density of the liquid metal is greater than that of the solid. Water exhibits this peculiarity also; that is why frozen water pipes burst and ice floats. If water resembled most metals in being denser in the solid state than in the liquid, the ice formed on lakes and rivers during the winter would sink to the bottom; there would scarcely be time for the summer’s heat to reach it there, and our continent would probably be a cold, desolate expanse.

(Continued from Page 3.)

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