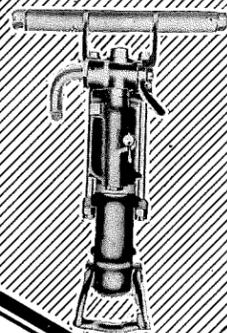
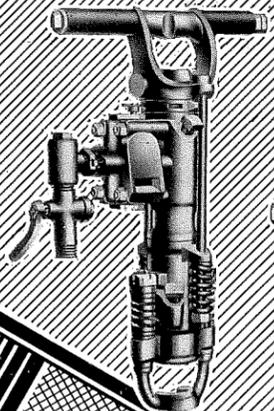


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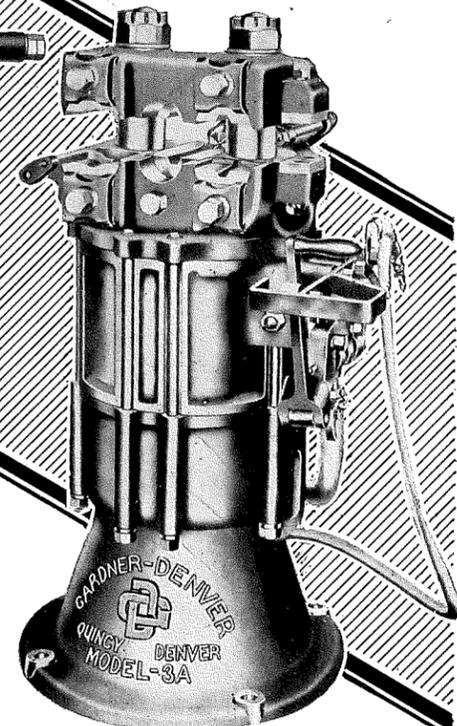
Model 95



Model 11



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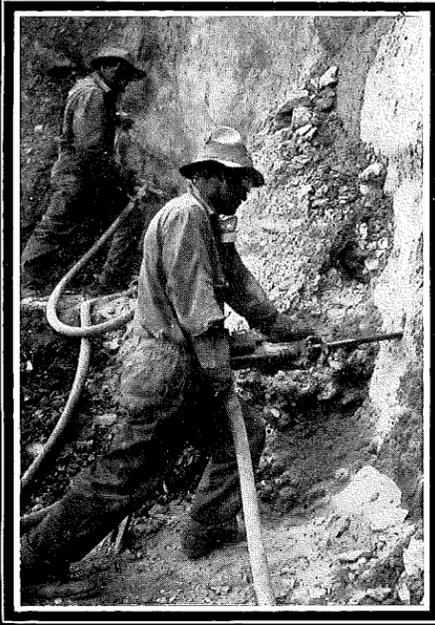


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# The COLORADO SCHOOL OF MINES MAGAZINE

Volume 20 No. 6

June 1930



The Summer Session Number

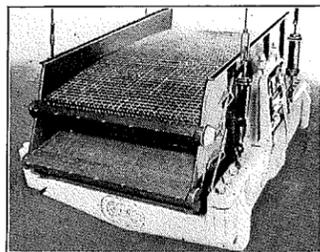
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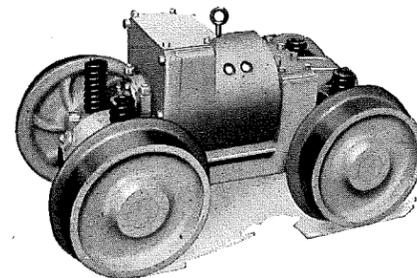
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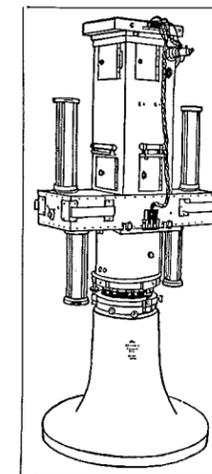
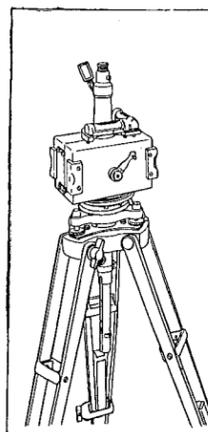
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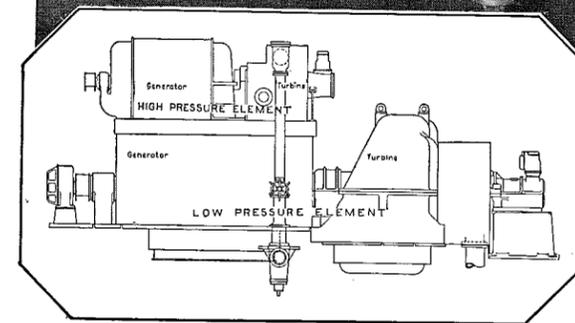
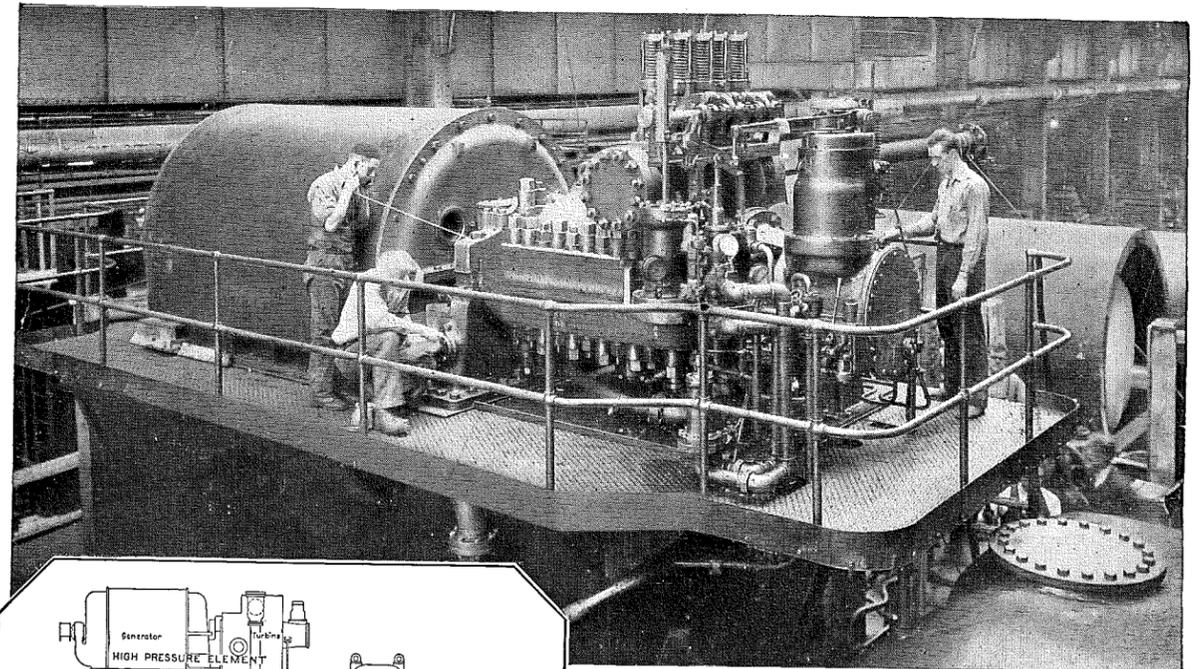
who has missed a credit which he needs for college entrance? If this lack is in Physics or Chemistry, Solid Geometry or Advanced Algebra, tell him he can make up the work by attending the Colorado School of Mines Summer Session.

## *Do You Know of Someone*

who is irregular in his technical course? If so, tell him he can receive during the School of Mines Summer Session, training in Chemistry, Physics, Mathematics, Descriptive Geometry, Surveying, Mechanics, Electricity, Geology, Engineering Design, Metallurgy and English. Credits accepted in other colleges and universities. Registration for the eight weeks courses begins June 30; for the six weeks, July 14.

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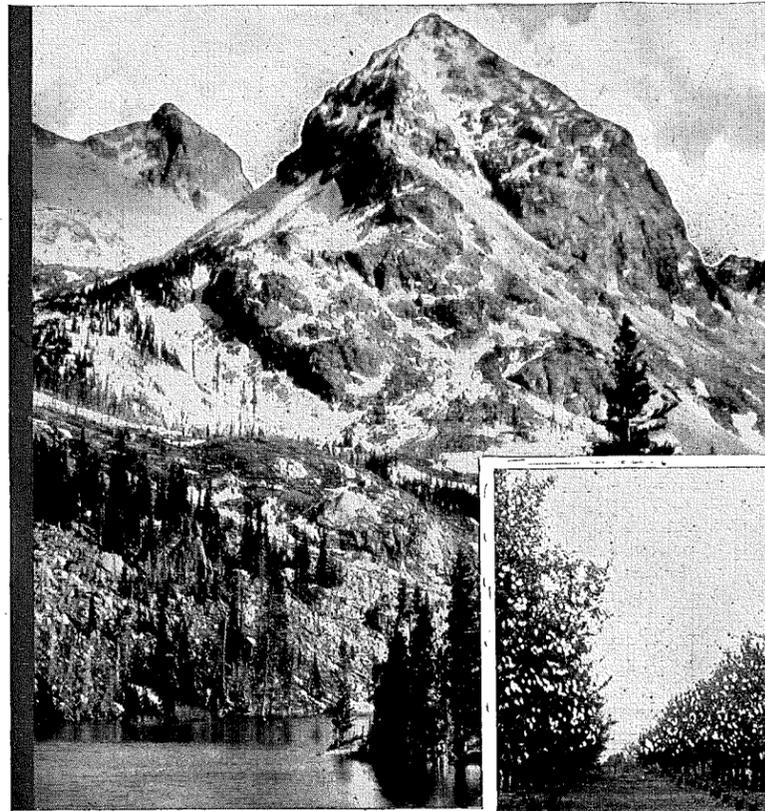
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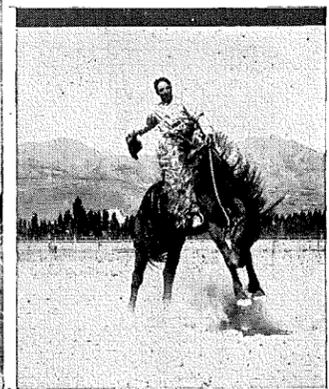


# COLORADO

# COLORADO



Warrior Peak in San Isabel Nat'l Forest. Below: Rodeos are a summer attraction. Colorado's orchards yield abundantly.



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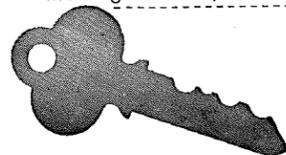
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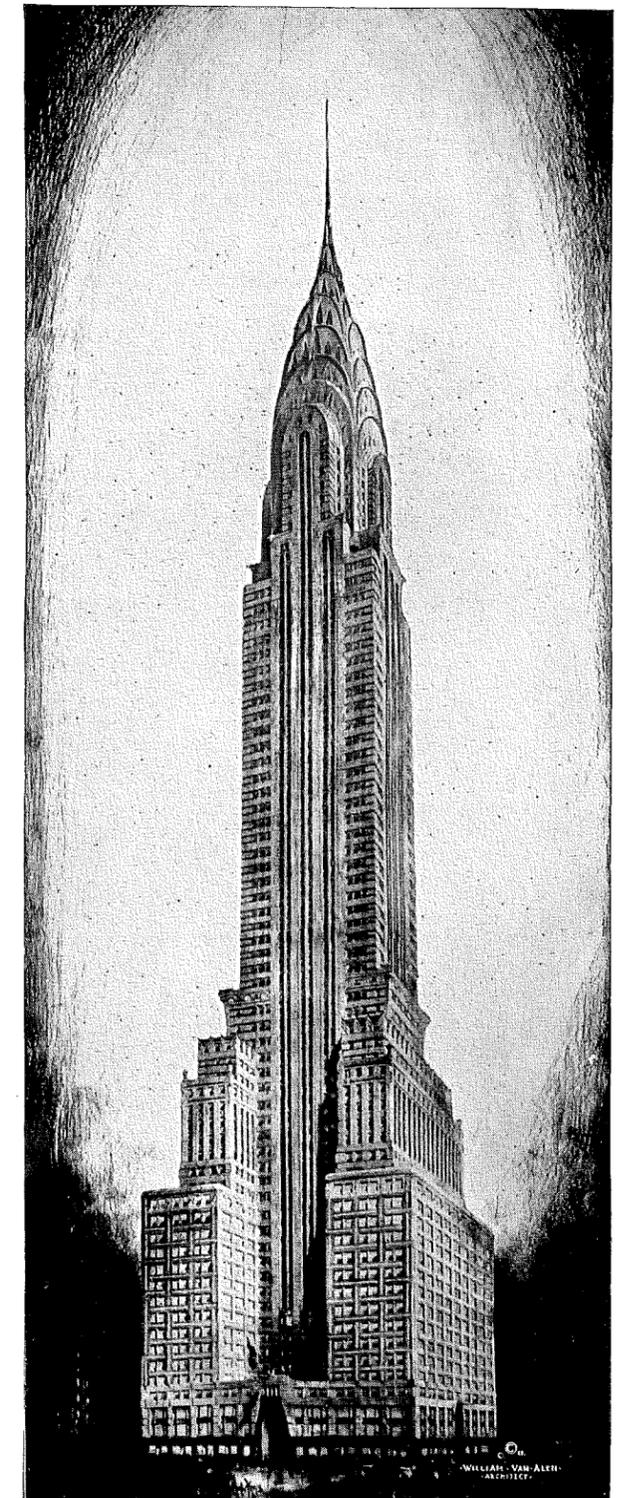
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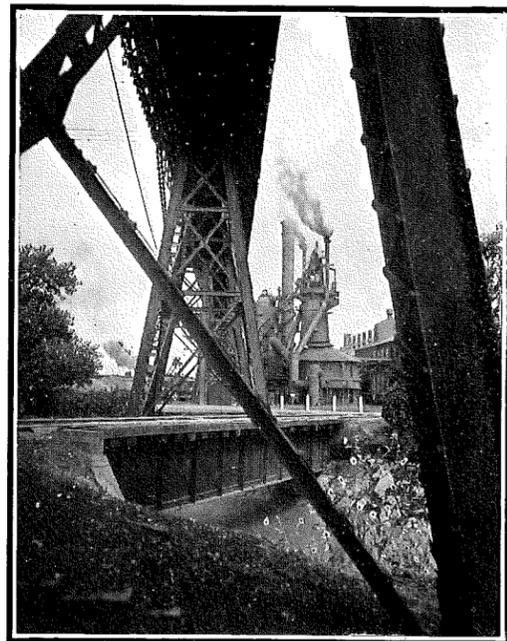
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# The COLORADO SCHOOL OF MINES MAGAZINE

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One dollar and a half a year

VOL. XX

JUNE, 1930

No. 6

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Published every month in the year by the Colorado School of Mines Alumni Association. Entered as second class matter at the postoffice at Golden, Colorado. Address all correspondence, including checks, drafts, and money orders, to C. Lorimer Colburn, Secretary, Colorado School of Mines Alumni Association, C. A. Johnson Building, 509 Seventeenth Street, Denver, Colorado.

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# Editorial & Comment

## Engineering Summer School

THE Colorado School of Mines summer session has come to be known as the "Engineering Summer School of the West." The seventh session will begin June 30, and more than two hundred are expected to register.

Alumni, you can do a great deal in helping to build the "Engineering Summer School of the West." If you know of a young man who wants to take a technical course during the summer, you should tell him about the summer courses at Mines.

Summer school bulletins have been mailed to the graduates. The School wants to keep the Alumni informed about developments. This bulletin will give an idea of the extent and nature of the summer courses. When it is read, see to it that it is passed along to some young man who may be interested.

There are sound reasons for conducting a summer school at Mines. Buildings and grounds must be maintained whether used or not. It is better to use them than to let them be idle. The summer session pays its own expenses.

And again, many promising summer students choose to attend the regular sessions raising the quality of the School's product. The location and climate are conducive to study and good health, and the School profits by having men come to Golden in the summer to study and enjoy the scenery and fresh air. These men are bound to tell something agreeable about Golden and the Colorado School of Mines after a summer here.

## Prospector to Local Sections

A COPY of the new 1930 Prospector has just been mailed to each of the Alumni sections. Mines men will find this a most complete volume, handsomely bound in the School's Blue and White. The book is an excellent piece of editorial engineering and includes sections on administration, classes, athletics, features, activities, organization and, a new departure in Prospector policy—a Panoramic division featuring views from the rest of the U. S.

This Prospector is dedicated to Irving A. Palmer, Professor of Metallurgy.

Members of each Local Section are urged to look over the volume which has been mailed to the Secretary of the Section.

## Industry and Research

MANY colleges all over the country are providing facilities for research work to assist in solving the problems of industry. Mellon Institute of the University of Pittsburg is an outstanding example. Few western colleges have attempted to excel in this.

When the research of any school attracts the attention of a particular industry, that industry will provide fellowships at such an institution for members of their staff.

Two fellowships from foreign funds have been granted to men who will do research work at the Colorado School of Mines during the coming year. The School must attract more Fellows in the future.

The equipment at the School of Mines is excellent for research pertaining to the mineral industries. The technical library at Mines is the best of its kind, and it has volumes on mining, geology, and metallurgy that can not be found elsewhere.

That which is needed most at this time is a working fund to give impetus to research at Mines. The Alumni could provide such a fund through its Foundation Plan. The machinery is ready; why not put it in motion?

## Eight Points

IN a recent number of the American Magazine appears a list of points which mark the educated man. These seem applicable to the engineer. Here they are:

- He keeps his mind open on every question until the evidence is all in.
- He listens to the man who knows.
- He never laughs at new ideas.
- He cross-examines his day-dreams.
- He knows his strong point and plays it.
- He knows the value of good habits and how to form them.
- He knows when not to think and when to call in the expert to think for him.
- You can't sell him magic.

### George F. Cooper ?

If anyone knows George F. Cooper who was in Tampico, Mexico in 1917, would he please communicate with C. Lorimer Colburn, 511 C. A. Johnson Bldg., Denver.

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**COLORADO SCHOOL of MINES FOUNDATION**

Established by the Colorado School of Mines Alumni Association, May 17, 1928.

The Purpose of the Foundation is to advance the engineering profession through the Colorado School of Mines; to provide a regular channel through which gifts, bequests and other donations may be made available; make possible the employment of the best teachers, the production of the best research and the provision for more adequate buildings and equipment.

## What Others are Doing

THE *Drake Alumnus*, published by the alumni association of Drake University, carried a full page advertisement in the May edition with this heading: "Others Can—Drake Can."

The subject of this page advertisement was the 1930 Alumni Fund. It will be interesting to quote here from this page, for it will show that the Colorado School of Mines Alumni are not undertaking a task which is unpopular and impossible. We quote:

"In 1922 we undertook to place Drake in line with practically all the alumni groups in America by the organization of THE ALUMNI FUND. It was explained at great length that the idea provided for an annual gift, of whatever size the giver wished to make, to the University—the sum thus secured to be used wherever it seems best in support of the institution.

"We characterized the idea as 'a Living Endowment' and the phrase has taken hold throughout the country, several other alumni offices having employed it since that time.

"About four hundred people responded to the first call. Then came a campaign and the Alumni Fund was set aside. A group insurance plan was tried with limited success. We returned to an attempt to popularize the idea but each time some other special campaign has appeared and the Alumni Fund has suffered.

"However, thousands of dollars have been given by alumni. At one time \$7,000 was applied on the new organ in the auditorium and the organ was to be known as the Alumni Memorial organ with possibly a name-plate so designating it.

"Each year whatever monies have been sent in have gone automatically to apply on the annual deficit. Not a cent has ever been wasted. Every dollar remitted has gone directly to the place where it would do the most good.

"We want to see the Alumni Fund idea take hold at Drake and have everybody really for it. We challenge our alumni to try to understand it. It doesn't seem hard, really.

"Here is a hard important fact: *After attempting various means of alumni financial support, practically every institution in America has now officially adopted this idea and is working it exclusively, consistently.*

"As this is written, Cornell University at Ithaca is engaged in an attempt to get a larger percentage of its alumni to contribute to the fund this year than Yale. Yale, heretofore, has held the record. It is a bloodless battle on the field of loyalty being fought with dollars.

"All right. Using the same idea last fall Grinnell raised a huge sum for the support of the College. The short, snappy drive was made just before Christmas time and was known as the Grinnell Candle-lighting. Every gift lighted a candle. Candles were lighted all over the world."

### A REVOLVING RESEARCH FUND

Many industries have endowed research schools in Eastern colleges and eventually this will occur in the West. Of course, that college prepared to demonstrate its superior fitness will be selected as the research school for the industry.

The Colorado School of Mines is an institution with an international reputation, and there is no reason why this School could not definitely take the lead in research in the mineral industries field. Once the School of Mines proves conclusively to the industry that it is the logical institution in the West for endowed research, much financial assistance from this source may be expected.

Here is what Georgia Tech alumni are doing in order to attract industries to the research being conducted at their Alma Mater. The *Tech Alumnus* had the following to say in the last issue:

"Tech is well known and well advertised all over the country, and if it can show a record of creditable work done, the institution should be in a favorable position.

"In the early part of February, a small group of alumni organized themselves into a body to undertake the establishment of a revolving fund for research at Georgia Tech and a minimum budget of \$2,000.00 was set as the basis for the small but urgent goal; although more could be used effectively.

"The Alumni Association believes that when all the benefits of this work become apparent it can secure increases to the fund so that perhaps \$5,000.00 will be available for the next department."

Most of this fund is to be used in solving problems confronting the textile industry.

# The Man Who Spoke to the Seniors at Commencement

By C. H. C. BRADEN

## a short biography

Director Scott Turner of the United States Bureau of Mines, has had one of the most varied careers ever credited to a mining engineer. Noted as the engineers of the mineral industries are for migratory predilections, many of them seem almost like home loving, retired business men after hearing an account of Mr. Turner's career.

He has worked for twenty-one different companies; and his work has carried him into every important mining State in the Union, into various countries of South America and Europe, and to Alaska, Canada and Panama; and his experience in Spitzbergen is a story in itself. Not only has he been engaged in mining activities in practically every nook and corner throughout the world, but he has mined coal, tin and all of the common metals, which is a record for diversification in itself.

Such a wide range of experience is proof that Director Turner is endowed with the ability to meet many situations and solve the various problems involved. Possibly it was this one characteristic more than any other which, in 1925, induced a committee from the mineral industries to choose him unanimously from a field of twenty prominent engineers as the man to direct the United States Bureau of Mines. This committee, selected by Herbert Hoover, then Secretary of Commerce, consisted of representatives of the American Mining Congress, American Institute of Mining and Metallurgical Engineers, National Coal Association, American Petroleum Institute and the United Mine Workers of America. To have had his name approved unanimously by so representative a group, is an expression of confidence implying great honor. Scott Turner has proved himself worthy of this confidence, and under him the Bureau of Mines has made splendid progress.

Like every other graduate mining engineer, Mr. Turner encountered uncertain days following his graduation from the Michigan College of Mines in 1904. An interesting story is told of him: He found himself out of school without a job, and so, it is said, he used his ready cash to buy a railroad ticket, which landed him in Tombstone, Arizona. Here he held jobs as miner and millman—jobs that often seem to the young graduate engineer too lowly to accept. It was an humble beginning of a long and successful career which, as has been said, led him to all parts of the world.

The following years brought to Mr. Turner much of the same sort of experiences that come to the young mining graduates today during their first years out of school. He went from one district to another, to Panama and then to Alaska. At last he had won recognition, and in 1911 began a series of travels which eventually led him to Spitzbergen in "No Man's Land", just 700 miles from

the north pole. And here, perhaps, is the most interesting chapter in the story of Director Turner's life.

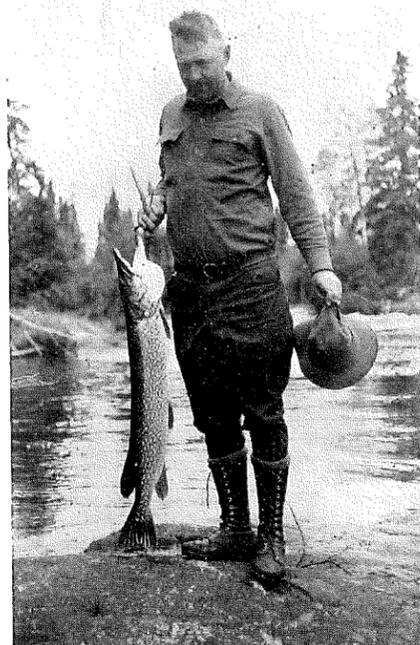
The Longyear interests of Boston sent Mr. Turner to this frigid field as manager of the Arctic Coal Company. Spitzbergen was then the possession of no country, having since become the property of Norway. The story goes that Turner, the manager of the Arctic Coal Company not only took charge of mining operations in this frozen territory, but he also passed what laws there were. He was judge and jury, prosecuting attorney and counsel for the defense whenever one of his laws were violated.

Since Spitzbergen had no government, Turner hoisted the American flag and took possession in the name of the United States. It is even related that when it became necessary to give a semblance of legality to papers of state, he stamped them with the great seal of Michigan, borrowed for this purpose. Six hundred square miles of territory were thus governed as a mere incident to the Longyear's mining operations.

Mr. Turner is a survivor of the Lusitania which was torpedoed by German submarines, an incident which eventually led to the entry of this country into the War. When the United States did declare war, Scott Turner served as an officer in the navy. After peace came he went to South America; then he became a consulting engineer for the Bureau of Mines and later, consulting engineer for the Mining Corporation of Canada.

Director Turner is an energetic, pioneering type of American. He is a great lover of the outdoors, and has spent many pleasant hours fishing the streams and lakes, and tramping with gun through the big timber in northern Canada. He has a lodge on Caugnewana lake in an isolated section of the Province of Quebec, and here he returns for a fresh taste of the hardy life whenever he finds it possible to do so.

It must be punishment indeed to chain to a desk at Washington a man who has been so active in the field and whose love for the rugged outdoor life is so great. Yet, this is only one of the many sacrifices which all men of ability must make when they are called into public service. Such men are imbued with the desire to contribute every portion of their expert knowledge to the task of enhancing the common welfare of the nation; and, other than the honor and recognition which their selection for high office implies, and the satisfaction they get out of serving, there is little reward for them.



# The Mineral Industry and the Young Engineer

## 1930 commencement address

By SCOTT TURNER

WE are here today to witness the graduation of 63 young men as Engineers in the mineral industries. It is an important occasion, and one in which the public takes a keen interest, since this school has long been famous for the educational facilities it affords young men, and for the high professional standing of its graduates.

It is fitting that once each year we should pause to review the path the student has traveled, and to reflect upon the perspective opening before him as an engineer.

I was invited to come from Washington to take part in this ceremony and to say something to these young graduates. In searching for a theme, it occurred to me that perhaps my best contribution would be to discuss certain beliefs as to college training, deal with the situation in which the young engineer finds himself on graduation, touch on the new ideas of the social and political responsibilities of the engineer, and point out what he may expect to find in practice, and, above all, what he must do to orient himself properly in the mining profession and maintain the best traditions of our brotherhood.

First, let me voice my appreciation of the place in which we are met. We are gathered on the campus of one of the oldest, largest and best mining schools in America. No lovelier spot could have been chosen on which to build an institution of this sort. In addition to the physical advantages the town of Golden offers, this school is in a commonwealth which is one of the greatest mining States in the Union.

Let us briefly review Colorado's mineral production. Within the past decade, she has frequently led all other states in the annual output of tungsten, molybdenum, uranium and vanadium ores. In 1900 alone, Colorado produced gold, silver, copper, lead and zinc valued at over \$50,614,000. In 1928, the last year for which we have complete figures, Colorado yielded mineral products worth \$58,595,000 and ranked fourth among all the States in the production of gold, fifth in lead, sixth in zinc and silver, ninth in coal, tenth in copper, and twentieth in the aggregate value of all such commodities. During the decade 1919-1928 Colorado is credited with mineral products valued at about \$614,000,000 and in the 20 years, 1909-1928, her output was valued at \$1,247,000,000. We have searched the records covering her yield of metal, coal and oil and find that up to and including 1928, this glorious State produced approximately 78,595,000 ounces of gold; 649,152,000 ounces of silver; 143,000 tons of copper; 2,250,000 tons of lead; 1,033,000 tons of zinc; 330,587,000 tons of bituminous coal and 3,210,000 short tons of oil. Adding together the estimated value of the five metals, we get a total of \$1,625,000,000; for coal, a total of \$650,000,000; and for oil, \$25,000,000, making a grand total of \$2,300,000,000, an astounding achievement and one of which you may all be proud.

The record of any school is the record of its graduates. If you wish to ascertain truly the standing of this school, and to realize the reputation and accomplishments of its alumni, you should travel far and wide, in this and in

other lands, over deserts and to the tops of high mountains, and from the tropics to the frozen North. In no other way could you learn the full meaning of what Sons of C. S. M. have done in engineering, and what they have contributed to the advancement of a great profession. I have been privileged to meet them on many trails, and I know their high standing in the mining world.

While many factors doubtless contributed to the success of these engineers, still I feel sure that in a large measure it has been due to the high order of training given by inspiring teachers, and to the whole-hearted cooperation of the people of a State famous for its support to mining. If time permitted, I might mention many of these famous alumni, and their names would call to your minds scores of others equally illustrious. Let me particularly pay tribute to the hundreds of earnest, able and sturdy alumni of Golden whose names may never appear in any hall of fame, but who are quietly, efficiently, and conscientiously going about their daily tasks. You will find them in mines, mills and smelters throughout the world. Although, in the eyes of the many, their individual reputations may be small, yet they are honored by those who know them, and in the aggregate they should be the pride of their school and State. I feel certain that the engineers of the Class of 1930 will prove worthy of their Alma Mater, and will maintain the high standard of work expected from men of Golden.

Now let us review your college days and see what they have done for you. I am told there are still many temptations in college. *I know there used to be.* Rest assured the same holds true in the professional life ahead of you. The main difference is, perhaps, that your greatest temptations in college were those offered by your teachers, who tried to entice you into realms of harder work, closer application, increased concentration, clearer thinking and better understanding, by animating your curiosity and increasing your powers of reasoning and of observation. In other words, here you have carefully and systematically been decoyed toward finer and loftier things. Do not expect that similar helpful influences will greet you on every side in your professional life. Often quite the contrary is the case.

You *should* have high moral qualities in college; character you *must* have if you are to become an outstanding engineer. As you left your homes to come to college, your adjustability was taxed and you sensed a greater independence than ever before; then you needed to be on your guard. In many ways, after graduation your power of adjustment is still further put to the test and you experience a still greater release from restraint. Now not only your *personal life*, but also that new and priceless possession, your *professional reputation*, must be cherished. Be doubly on your guard from this time on! Make no snap judgments as to right and wrong.

Try to *change your point of view* quickly, and adapt yourself to your new conditions. Before graduation, you received kindly suggestions from your teachers; you could complete work at your leisure or leave it incomplete; you could alternate excellent work with poor work, as the mood struck you. You could loaf and rest for a few days and later apply yourself to your studies; your instructors would help you a great deal if you wished it, and patiently and repeatedly explain things. Initiative was not required; you could work by and for yourself, in as individualistic a manner as you chose.

Now suddenly, on your first job, you probably must execute sharp orders without asking too many questions; you must uniformly do neat and accurate work at a high rate

of speed, whether you feel like it or not; you will be expected to apply yourself vigorously, with no let-ups; you must go ahead and do your job entirely on your own; your value to your employer will be in part what you do under orders, and in part what new and improved methods and devices you can suggest. You must work cooperatively, and for the good of an organization.

Obviously, as outlined above, the two points of view are quite different, but the young engineer must quickly adapt himself to the change. Hence I say, *adjust yourself* to the new order of things with as little friction or delay as possible.

Study carefully the requirements of your chosen profession. Whenever feasible, make contacts with the leaders in your line; familiarize yourself with their biographies; reviewing their experiences may comfort you when you feel that your apprenticeship is difficult and your progress is slow. You must learn to estimate men, the meaning of personality, the strength and weakness of the individual with whom you come in contact, his purposes and motives, his ambitions and what he has accomplished, if you are to become an outstanding engineer.

Probably you all feel regrets at leaving college. You doubtless dread the separation from your friends. Many people like to think that college friendships are the best. I believe this myself; I know how fine and lasting they are. Such friendships, beginning at an impressionable age when youth, exuberance, vitality and the joy of living are coupled with lack of responsibilities and selfish aims, seem to be apart from all others. But do not be misled into believing that no new and precious friendships lie ahead of you. They are of a different kind, and depend largely upon effort, work, and accomplishment. The mining engineer is particularly fortunate in this regard. He is most apt to undertake difficult jobs in isolated or dangerous localities, where the technical staff may be small and the demands made on it may be heavy. Here the value of team work soon becomes apparent; co-operative effort, even though it is not successful, so long as it is honest, earnest and patiently and hopefully sustained, leads surely to friendship.

We know that nothing throws people together like the unusual; unity may come at once from common task or mutual danger. A ship may be crowded with stand-offish passengers who have journeyed together for days, perhaps, without speaking to each other; let something unexpected or startling occur and at once the passengers chat and visit and proceed to develop friendships. People living in the same block may in the course of years never have spoken to each other; let a fire, or earthquake, or some other common danger menace them, and at once they react in a friendly manner. Whenever a common cause makes combined exertion necessary, there we find the beginnings of friendships. What man is more apt to be called on to cooperate in difficult enterprises than the mining engineer? Who is more often asked to meet the unexpected, combat peril, and accomplish the difficult? Fighting *against* a man may lead to mutual admiration and respect, but I think the scars of battle still remain. Fighting side by side *with* a fellow-engineer, for a worthy purpose, even though you lose, leads to enduring friendship.

The first and inflexible rule you must now adopt is: Always keep fit. *Good health* is your primary requirement. When opportunity comes, you must be ready for any job in any climate or altitude. If you are sent abroad into a difficult region, you cannot afford to start in poor health. Even though you are employed near by in your own

country, do not handicap yourself with the irritability and pessimism that come from ill health and disease.

The finest single byword you can follow as an engineer, is the same that you followed as a student, that is, *loyalty*. Up to now it has been loyalty to your athletic team, your fraternity, and your college; from now on it will be loyalty to your profession, to your employer, and to the engineering group of which you may be a part.

Not so many years ago, business was conducted on a pitilessly competitive basis. The old notion of smart business was a deal in which one man got the better of another. The new idea is a transaction which is beneficial to both parties. The recent order in engineering is *cooperation*. I need not elaborate on this point, since you see cooperative business on every side. Recognize early in your professional life the necessity of harmonious action. Join the technical societies or institutes most closely identified with your work. Exchange personal knowledge and experience, by writing technical articles and taking part in scientific discussions.

You will note I have said: *Write technical articles*. I earnestly advise it. Do not be ashamed to begin. The young engineer often feels he is not competent to write. Try it. The only way to learn to write, is to *write*. You will be astonished at how quickly you improve. It has been demonstrated that the surest way to learn everything concerning a subject is to write about it. Putting your ideas or experiences in writing tends to crystallize and clarify them. Before you can write clearly, you must think clearly. You hear much nowadays of the glories of self-expression. I urge you to apply this to your technical experiences.

I know a number of cases where technical writing has brought a young engineer to the attention of important employers, and led to engagements which profoundly influenced his ultimate success. Diffidence in this regard is inexcusable; share with your fellow-engineers your thought, knowledge, and experience. Help them at the same time you help yourself. The best recent example I know, in this matter of willingness to write and give to others detailed engineering knowledge and experience, is shown in the fine willingness and cooperation now being displayed by the leading engineers of this country by preparing, for publication through the United States Bureau of Mines, scores of papers on mining and milling methods and costs. I recommend to you the helpful spirit which made possible the production of these papers.

On graduation, do not scorn the *lowly job*. Be content at first to work constructively at the bottom of the ladder; in due time, you will work upward. Later on, a few of you may find yourselves at the top, whence all others will want to pull you down. Probably you will find more satisfaction in working on some engineering project or mining development which is incomplete or unsuccessful, and helping to finish it or pull it out of the hole, than you will in merely joining the staff of a well-established and successful venture of long standing. The former is pioneering; it appeals to the creative instinct so strong in us, and offers romance and adventure. The latter means only becoming a small cog in a well-oiled and smooth-running machine. I strongly urge you, either individually or in groups, to give your creative faculties a chance while you are still young. This does not necessarily mean to undertake exploration or development work in foreign lands, or hazardous adventures, but it may mean to assist in making successes of new or doubtful enterprises, whereby you may feel the keen thrill of winning against odds. Play the hard

games in your youth; treat obstacles as summonses to fight; defy obstructions, and do not let impediments turn you aside.

When I graduated from mining school, more than 25 years ago, it was difficult to find a job. As I recollect it, only three men out of my class of 44 got track of jobs through the school. The other 41, many of them with slender financial resources, and with very small acquaintance with mining men, were turned loose on an unfeeling world already overcrowded with engineers. Common labor was the only work open to many, and often they had to travel hundreds of miles to get that. Only the more determined men continued the struggle. Perhaps starting at the very bottom and taking some hard knocks was good training and developed manual skill and self reliance. Undoubtedly one learned to measure a day's work and to understand the viewpoint of the unskilled laborer, the miner or the millman. However, when lowly jobs are too long continued, an economic waste is undoubtedly involved. I am sure I pushed a mine car, swung a shovel, and pounded a drill, long after I had mastered their use. By reading and listening to discussions about employment for graduates, I learn that all this is now changed, and that the demand for young engineers often exceeds the supply. This is an admirable improvement, provided the recent graduates can stand prosperity of this kind, without acquiring a cocksureness, an exaggerated sense of their own importance, and a predilection for white-collar jobs which may in the long run militate against their usefulness.

Likewise, three decades ago, much time was lost when it became necessary or advisable to seek a new job. Days, weeks, or even months of "rustling", unprofitable days spent calling on mining men or visiting offices in various camps and cities, were considered inevitable and a necessary penalty for practicing the profession of mining engineering. Now, when the world has generally come to recognize that irregular employment is the worst and most universal of all industrial evils, I am pleased to learn that, through better organization for placing technical men and improved employment facilities in the colleges and societies, and through quicker communication and exchange of employment news, the economic waste attendant on professional idleness is being eliminated.

When inaction is compulsory, put in the time you can spare from soliciting employment, or use the periods when you are waiting for a decision from prospective employers, in broadening your professional acquaintance, in visiting mines and plants, in attending meetings and conventions, in taking part in engineering discussions and in writing technical papers. Thus what might otherwise be lost time may actually be turned to ultimate advantage.

I am told that colleges are now in close and constant contact with industry; I used to feel that they were not, and that the technical schools kept a certain aloofness, paying little heed to its rapid progress, constant change, and real needs. Nevertheless, as I have before suggested, the recent graduate is apt to find the leisurely pace of college too slow for industry. The speed, initiative, accuracy, snap, and drive required of him in business are new to him, and while the habit of work may have been formed during the college course, still it was not the sustained and exacting work required of the practicing engineer. During the college year, the student could generally set his own pace. Things did not change much; no new conditions had to be met suddenly; emergencies were rare. On the other hand, methods and practices in the commercial world often must be changed so rapidly, to keep abreast of industrial com-

petition, that hard, accurate thinking and quick decisions under pressure are required. From loitering theory to rapid practice is a sudden change for the young engineer, but again I must remind you that he must speed his pace and never be content to lag behind.

In industry, profit is frequently a small difference between *income* and *outgo*; early training in maintaining a proper balance between the two will help you toward commercial leadership. The mental habits of youth are likely to be always with you. You are fortunate if the proper meaning and use of money were taught you during undergraduate days. I hope that it is already instinctive with you to keep track of and analyze your personal receipts and expenditures. In practice, you will need to apply such a faculty before you can properly manage a mine. Have pride in your financial efficiency, and when you spend money, get a commensurate return for it. The engineer judged to be successful may be the engineer who knows how to make a little go a long way, who knows how to get his money's worth. The engineer-student who has had but moderate means or opportunities, but who has accomplished much, has had fine training for future mine operation. No matter what certain successful automobile manufacturers or victorious politician economists tell you, disregard advice to keep on spending; instead, adopt the seasoned faith as to the need for saving, and never spend all that you make.

At various times during his career, every engineer is required to pause at cross-trails and decide which course to take. Obviously this decision will directly affect his future professional career. For instance, I remember a Friday in London many years ago when I carried in my pocket three proposals, with the following Monday set as the final day of decision. One job would take me to a copper mine in the high Andes in the Argentine republic; one would lead me to alluvial gold workings in Eastern Siberia; and the third necessitated going to coal mines 700 miles from the North Pole. On my decision rested the future trend of my professional work. Most of you will find yourselves in similar predicaments. How are you going to decide? I know this question will puzzle you, but remember there are only two methods of approach: Study the facts, and ask others for advice. I need not here elaborate on these points. Your final decision must be made alone, perhaps almost involuntarily, and will always involve the element of chance. Analyze all available information, interview your hardest-headed friends, take wise counsel; then decide quickly, and make up your mind *never* to regret the choice.

Let us turn back to the question of college courses and consider the possible bearing of early training on the much-discussed problem of the engineer as a citizen. It has been considered that the training of an engineer is too often vocational training; that it is a pity all engineers cannot have had a period of liberal training before taking up pure engineering. Offhand, the so-called liberal courses should bring more ready adaptability to deal with the unexpected, to face with assurance situations which have had no parallel in one's experience, and to move without hesitation under conditions which were heretofore unknown to one, than the specialized course in mining engineering.

We hear increasing talk as to the necessity of making the engineer articulate, and bringing him into public life. The social implications and responsibilities of engineering are pointed out, as of equal importance with the prodigious marvels of engineering ingenuity. You often read of this as the logical result of the increasing consciousness of the

engineer as to his relative position in our modern industrial civilization.

Some wag has noted that *man* is the noblest work of God, but that *man* is the only one who has said so. Perhaps *engineers* are the only claimants as to the necessity of their going in for public life and service; at any rate, some liberal educators still maintain that a well-rounded general education is the better training.

While the engineer may have contributed to the new social and economic order, in addition to having materially bettered his professional technique, let us not go beyond the bounds of reason in estimating our importance in public life. The keenest engineer, when elected to public office, may have to subordinate many of his professional ideals, put aside and forget various of his engineering habits, and adjust himself to the new job so completely that we might see in him few of the characteristics of the professional engineer. In fact, to do his job, he must become something of a conventional public man. He may face the necessity of substituting compromise and broad adjustment for the rigid rules of straight engineering. Expediency may have to be his new watchword, rather than accuracy and engineering truth. To me, the prosperous engineer who relinquishes his profession and becomes a successful public administrator, demonstrates his adaptability and general competence rather than his technical skill. His engineering education and experience may have fitted him for his new field of activity, but let us be a little cautious in insisting that engineering principles and ideals are being rapidly introduced into public life. Why not simply stick to it that a liberal education, *plus* an engineering course, makes for the most adaptable and useful citizen? We can still with reason claim that the introduction of more engineering into government is good.

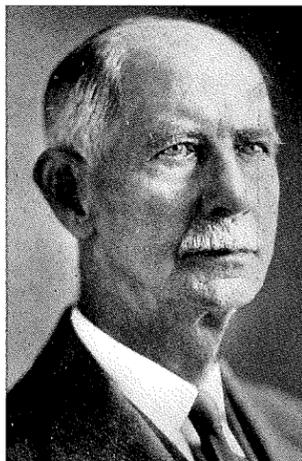
A Member of the Congress of the United States recently listened to my complaint as to the difficulty of placing *facts* before a Congressional Committee. He said that the trouble with engineers is they think everything should be judged, and legislation should be passed, solely on the basis of engineering fact. Actually, he said, the Congress may properly be more interested in what the people want than in the facts. Often the two are wide apart, and in such cases, facts alone may not govern legislation. This man put into words what I had noted but had not understood—that science, which deals with facts, must sometimes be disregarded for what is pleasing, for what is desirable, and for what is popular. Thus legislative action might be based more on knowledge of public sentiment, than on facts and their interpretation.

I believe it behooves the engineer, individually and through his technical organizations, to come forward when facts are needed, and thus assist in protecting the legislator and the public from the passage of unwise measures. Of course the engineer is exercising more and more influence in the choice of competent men for public office—but let us not delude ourselves by thinking that in matters of State, *political processes* are rapidly giving way to *engineering methods*.

The mining engineer is perhaps freer than any other engineer from the charge of having created many serious social problems by the introduction of new devices. In the mines, improvements in practice resulting in increased tonnage have often been accomplished by exercising ingenuity in taking advantage of natural conditions. However, the present rapid trend toward mechanization, par-

(Continued on page 37)

## Honorary Degrees Conferred



RICHARD A. PARKER

and is president of the Colorado section of the Columbia Alumni Association.

Mr. Parker's career as a mining engineer dates from 1878 when he became a surveyor in the state of Colorado. At one time he was president of the Zinc Lead and Smelting Company and a director of the U. S. Coal and Oil Company. It was a result of his advice that the United States Smelting, Refining and Mining Company bought properties which gave this great corporation its start.

Richard A. Parker has been chairman of the Mining Bureau, Denver Civic and Commercial Association, for three years. He is a member of the Mile High Club, the Colorado Scientific Society and various associations of engineers. He is one of the directors of the Denver Art Association.

Charles W. Henderson has been a resident of Denver since 1908 when he was placed in charge of the United States Geological Survey. In 1925 Mr. Henderson was made head of the Denver office, economic bureau, of the United States Bureau of Mines, a position which he still holds.

A most noteworthy service which Mr. Henderson has rendered this State is his activity in promoting the cooperative geological survey of Colorado, which is being undertaken by the United States Geological Survey in conjunction with the Colorado Geological Survey.

Mr. Henderson is the author of the "History of Mining in Colorado." He has written many articles for the technical press and volumes of reports for Government departments. He is a member of the American Association of Petroleum Geologists, the Colorado Scientific Society, Teknik Club of Denver, the A. I. M. E. and various other social and professional organizations.

Three honorary degrees were conferred at the 1930 Commencement exercises. The Doctor of Science degree was given to Scott Turner, Director of the Bureau of Mines; to Richard A. Parker, Denver Mining Engineer, and to Charles W. Henderson of the Denver office of the Bureau of Mines. A biography of Director Turner appears elsewhere in this issue.

Richard A. Parker has been active in promoting engineering education in this country for many years. He is a graduate of the University of Columbia



CHARLES W. HENDERSON

# Doctor Paul Meyer Has Been Made an Honorary Alumnus

he is loved by all Mines men

THE second honorary membership in the Colorado School of Mines Alumni Association was conferred upon Dr. Paul Meyer at the Annual meeting of the Association May 15. The membership was voted in response to a petition submitted by a group of Alumni who once were students of Doctor Meyer.

Unable to attend the meeting because of illness which has confined Doctor Meyer to his bed for several weeks, he was compelled to accept the certificate of honorary membership at his home in Golden. A reproduction of the certificate is shown here.

Doctor Meyer was professor of Mathematics at the Colorado School of Mines for seventeen years. He came

to Golden in 1883 and it is recorded that he arrived on the campus the same day as Dr. Regis Chauvenet. The distinguished former president of the Colorado School of Mines and Doctor Meyer met for the first time on the steps of the Chemistry building, then the principal edifice on the campus. Thus it can be said that these two men, so prominent in the history of the School, began their long and valuable service to Mines at the same moment. This meeting was the beginning of a sincere friendship which endured until the passing of President Chauvenet. Doctor Meyer not only served as professor of mathematics, but he worked hand in hand with President Chauvenet during the crucial formative period to build upon the first beginnings of the School of Mines an institution whose prestige has never since been doubted. To the efforts of these two men, Regis Chauvenet and Paul Meyer, is due in great part the splendid reputation of the Colorado School of Mines today.

The ability of Dr. Paul Meyer as a mathematician was appreciated by his contemporaries, and his mathematical contributions were given recognition throughout the world. The presence of Doctor Meyer on the School of Mines faculty brought much honor to the institution. It is recorded in President Chauvenet's Memoirs that "Profes-

sor Meyer filled the chair of mathematics with distinction until his retirement."

Doctor Meyer took up the practice of medicine in Golden in 1900, a profession which he follows actively today. In recognition of his long service to the School, the Board of Trustees made him Professor Emeritus of Mathematics in which capacity he has since served.

Mines men who were graduated between the years 1883 and 1900 cherish the memory of the association with Doctor Meyer, and it was because of the deep friendship held by these men for revered Doctor that they sought honorary membership in the Association for him. Even today he is a tradition on the campus, and the students tell over and over again the stories about him which have been handed down through the years.

To sit in the Doctor's office and listen to his accounts of other days, is a rare privilege. His sense of humor is

keen, and he will inject no end of it into every incident, which he describes so vividly. If he has the slightest inkling that one wishes to use what he says for publication, he will object strenuously. He does not want the happenings of his life, which seem so simple to him, to be glorified.

Not all of the graduates and former students under Doctor Meyer were able to sign the petition for the granting of this honorary membership. Many of them were far distant and could not place their names on the long list which completely filled three letter pages. Some of the old familiar names appearing on this list were: W. B. Milliken, '93; E. P. Arthur, '95; Lewis B. Skinner, '95; W. H. Paul, '96; Henry C. Beeler, '96; J. E. Norman, '98; O. R. Whitaker, '98; Fred C. Steinhauer, '99; Fred Jones, '00.



Doctor Paul Meyer in His Office Where He Diagnoses the Ills of His Patients Today.