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History of the Metallurgy / Mineral Processing Programs (1900-2022)

Jerome Downey

Larry G. Twidwell

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MONTANA
TECHNOLOGICAL UNIVERSITY

Montana Tech Metallurgical/Materials Engineering Centennial Celebration (1922-2022)

History of the Metallurgy/Mineral Processing Programs (1900-2022)

J.A. Downey, D.Sc.
Professor and Head
Metallurgical/Materials Engineering Department
School of Mines

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Emeritus Professor
Metallurgical/Materials Engineering Department
School of Mines

Information sources for this presentation are gratefully acknowledged

Montana Tech 1893-1984
Terrence D. McGlynn
Publisher: Montana Tech Foundation

MAGMA
1926-2006 some years missing

Commencement Programs 1922-2021

Yearly Catalogs: Montana State School of Mines, School of Mines, Montana School of Mines, Montana College of Mineral Science and Technology, Montana Tech of the University of Montana, Montana Tech Focused University, Montana Technological University. 1900-2022 (a few years are missing)

Archives West

Internet Searches

Personal Recollections of Faculty

MONTANA
TECHNOLOGICAL UNIVERSITY

Available (by email request)

jdowney@mtech.edu
ltwidwell@mtech.edu

- **Presentations (PPT) by Downey and Twidwell**
- **Metallurgical Engineering Program and Faculty Yearly History (31 page spreadsheet)**
  - Table of Department Heads, Faculty, and Major Events
  - List of all Metallurgy and Mineral Processing Faculty by year (1900-2022)
  - Follows the advancement (by year) for individual faculty from instructor to full professor
  - College and University name changes
  - Department name changes
  - Major events (dates and comments)
  - Early day pictures of faculty
  - And More

A well deserved tribute to Terry

Terrance D. McGlynn
MONTANA TECH
1893-1984
Montana Tech Foundation

"Terry taught students that to sign one's name to a document meant the document was accurate and the effect and care in preparing the assignment were the best that could possibly be. Terry combined his enthusiasm for literature, writing and hitory, not only to his students but also in those he met throughout the state. Thus, through his pioneer spirit, he instilled in students a continuing mission to reach academic excellence while at the same time he provided his students with an example of humanitarianism." (Board of Regents, 1984)

Montana Technological University History:

The *Early Years* (1896-1920)

Presidents (15) and Stuff

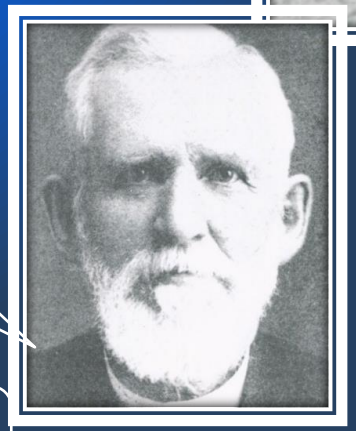
School of Mines Building 1900
Later renamed "Main Hall"

1896 construction started. Montana State School of Mines opened for classes in 1900. First graduate was in 1903.

For the 1st two years the only degrees were Mining Engineering (graduates were designated Engineer of Mines EM) and Electrical Engineering (EE) which was terminated as a degree in 1904

The EM designation was continued until 1922 when the first two degrees were initiated: B.S. in Mining Engineering and B.S. in Metallurgical Engineering

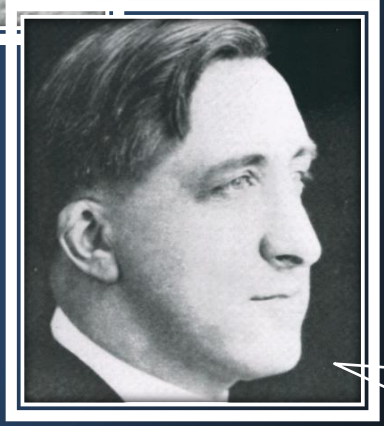
Prof of Mathematics Leonard carried a full teaching load along with his presidential duties for 6 years. He had 5 faculty in 1900. He died in the Leonard Hotel at 85 years old.



N.R. Leonard
1900-1906 (1st)

C.H. Bowman
1906-1918 (2nd)

He taught a full load of courses (including Metallurgy) while serving as President. He was known to be "devoted to his students and to his institution".



Dr. C.H. Clapp
1919-1921 (3rd)

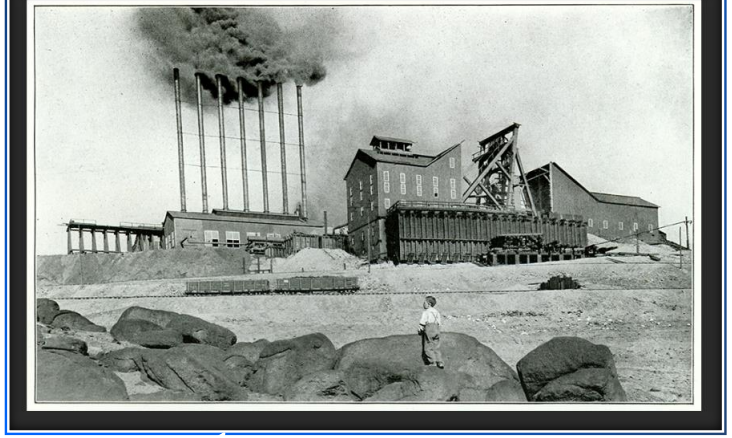
He laid the effort to establish the new degrees in Metallurgical and Mining Engineering

Clapp was President of the Montana State School of Mines. He was known as the "Founder" and was the first Director of the "Montana State Bureau of Mines and Metallurgy" (established in 1919): Now the Montana Bureau of Mines and Geology). English and Economics began under his presidency.

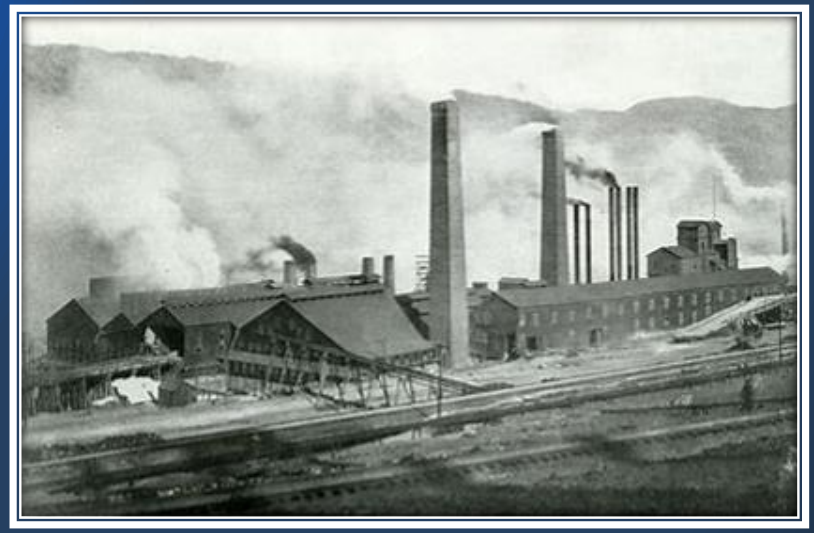
1908 Metallurgical Building. In 1919 it was renamed the Mill Building

What was it like in those Early Years?

Mining around Butte at the time MSSM began classes

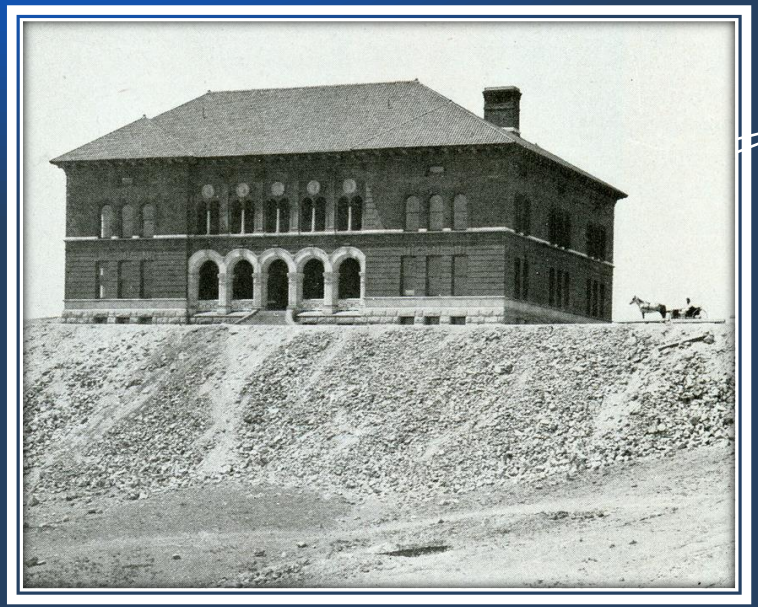


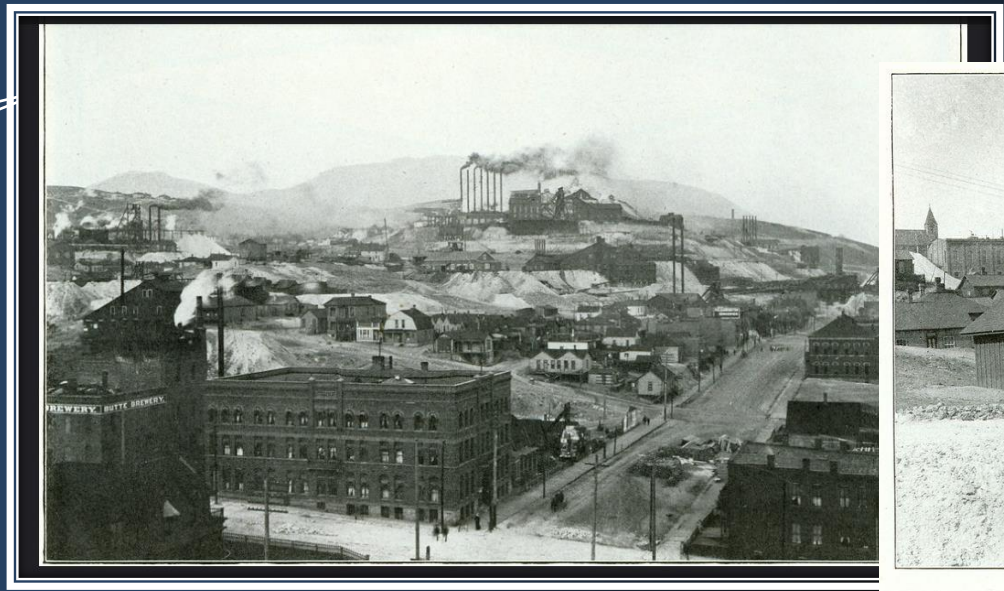
Colusa Parrot l Smelter, Centerville 1900

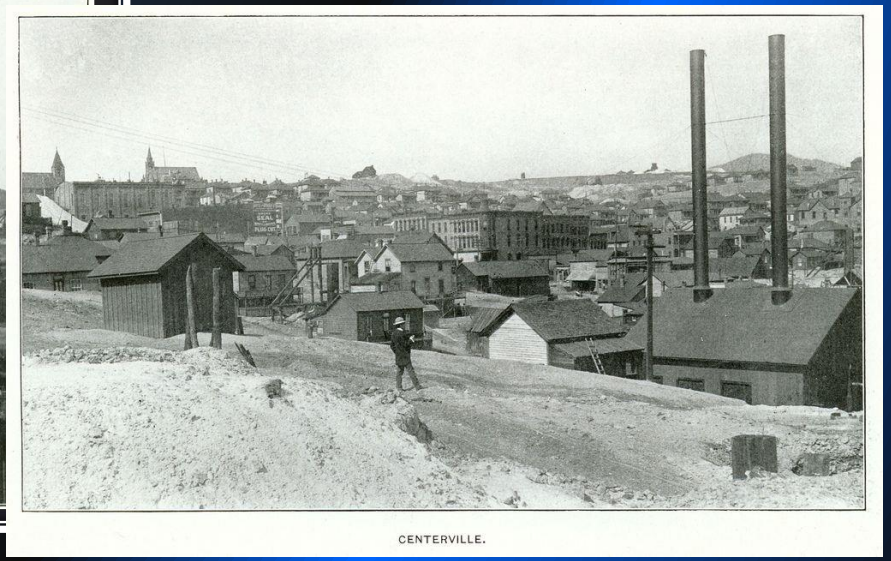


Montana Ore Purchasing Company Smelter 1900

10.000 men worked the mines and smelter in Butte in 1900
Used 3 to 4 candles underground during a 10 hour shift



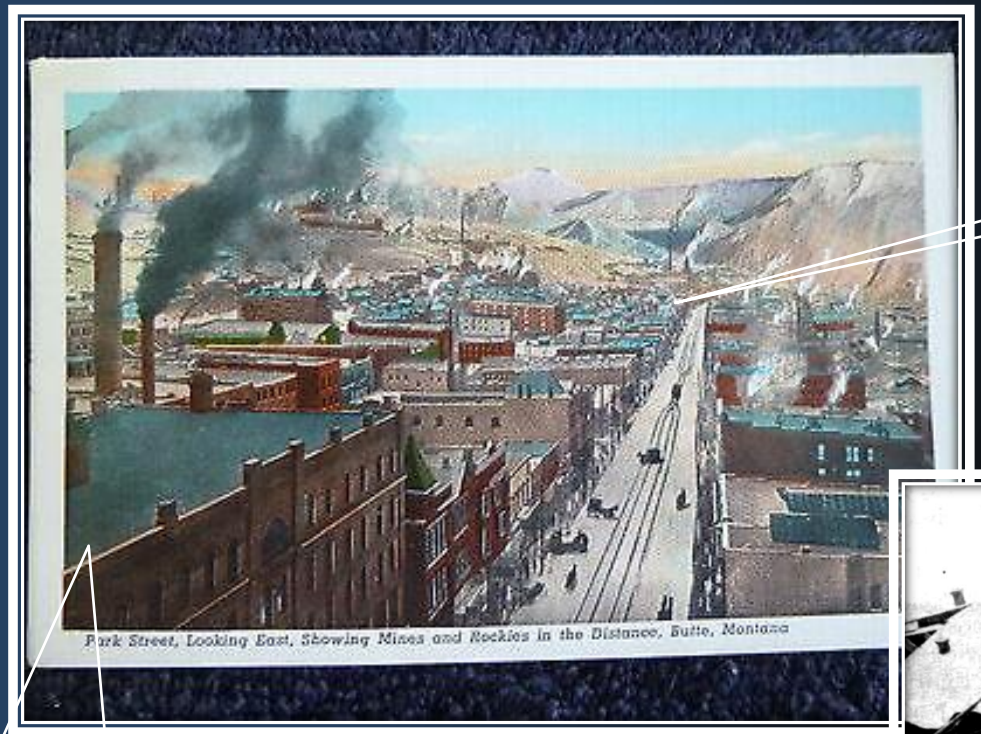




Activities around Butte near the time Metallurgical Engineering was established at the MSM

60,000 people in 1920

Union gathering in 1914s



Park street in 1920s

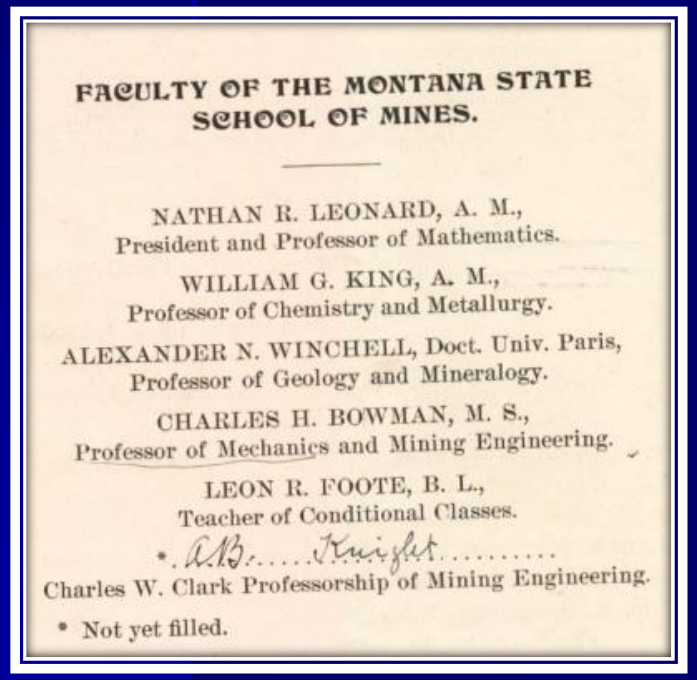
"Largest hard rock mining disaster in world history" occurred in 1917 (168 miners died during an underground fire disaster). There was great unrest among the workers following the disaster.

Unions lost their power in 1914 due to corruption. Thereafter the Companies maintained open-shop working conditions until 1934.

Union Hall destruction by dynamite explosions in 1914 (WIkipedia). Martial Law established using 500 National Guardsmen

Early History

First Faculty 1900



FACULTY OF THE MONTANA STATE SCHOOL OF MINES.

NATHAN R. LEONARD, A. M.,
President and Professor of Mathematics.

WILLIAM G. KING, A. M.,
Professor of Chemistry and Metallurgy.

ALEXANDER N. WINCHELL, Doct. Univ. Paris,
Professor of Geology and Mineralogy.

CHARLES H. BOWMAN, M. S.,
Professor of Mechanics and Mining Engineering.

LEON R. FOOTE, B. L.,
Teacher of Conditional Classes.

*.....
Charles W. Clark Professorship of Mining Engineering.

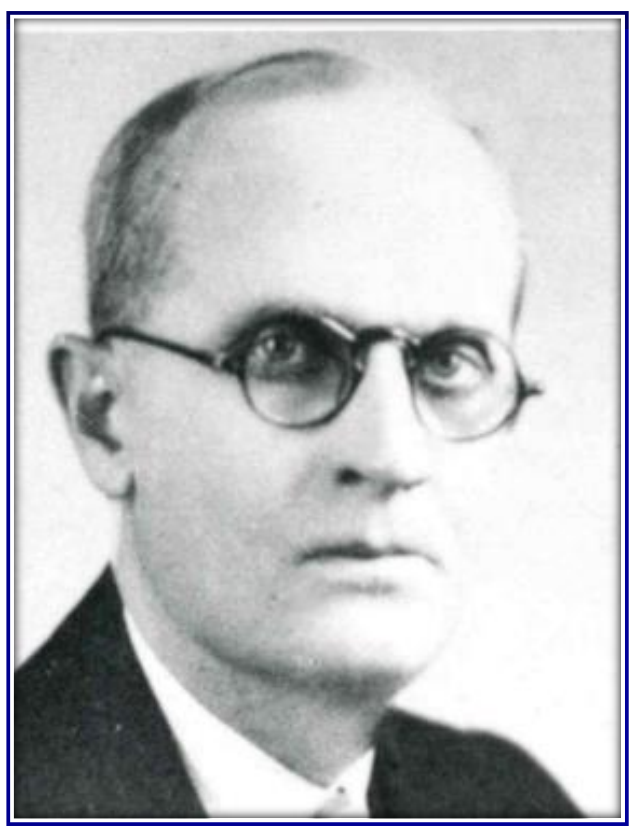
* Not yet filled.

The Montana State School of Mines MAIN Hall cornerstone was laid in 1896. Classes started in September 11, 1900. The only degree available was the Engineer of Mines (E.M. until 1922).
In 1900 there were 17 freshmen, 3 sophomores, and 1 Junior. 18 students were admitted to Special or Preparatory classes. The first graduate was Lois V. Bender (1903).

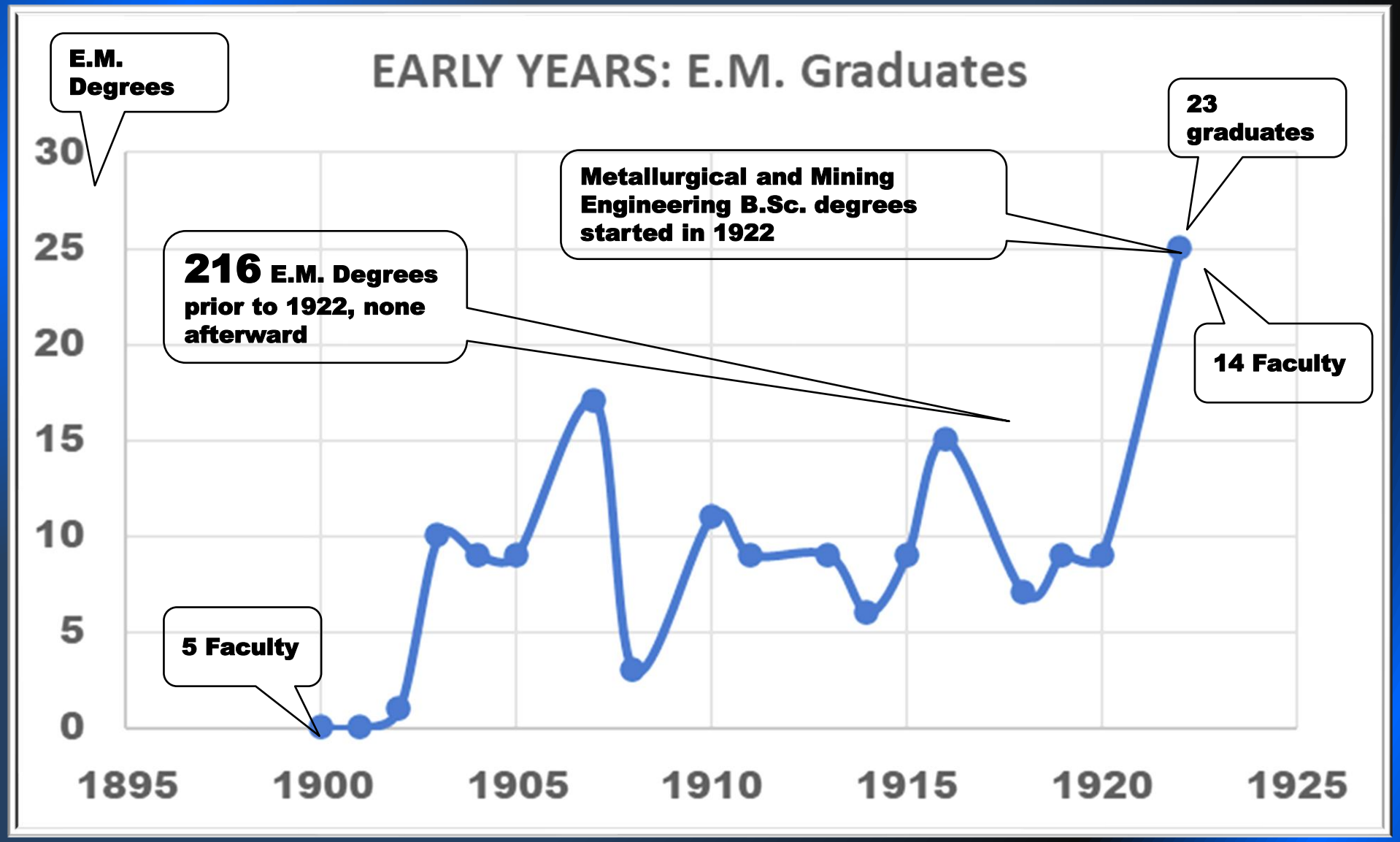
Other School of Mines included the Michigan School of Mines (1885) and the Colorado School of Mines (1870).
17 states originally established School of Mines.

Of the 17 only CSM has kept the name School of Mines

Bender became General Superintendent of the Anaconda Reduction Works in Anaconda



Louis V. Bender
First E.M. Graduate
June 1903

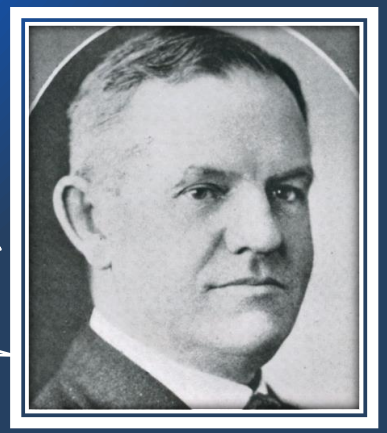

E.M. Degrees
EARLY YEARS: E.M. Graduates
23 graduates
Metallurgical and Mining Engineering B.Sc. degrees started in 1922
216 E.M. Degrees prior to 1922, none afterward
14 Faculty
5 Faculty
30
25
20
15
10
5
0
1895
1900
1905
1910
1915
1920
1925

Montana Technological University History:
The *Middle Years* (1921-1956)

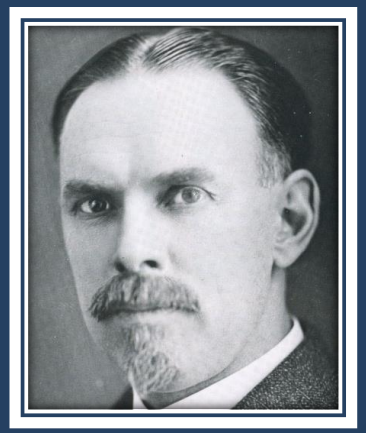
Presidents

Craven joined the faculty in 1905 and brought extensive experience in gold and silver mining. His specialty was hydrodynamics and chemistry. He advanced to President in 1921

President when Metallurgical Engineering program was initiated



G.W. Craven (4th)
1921-1928

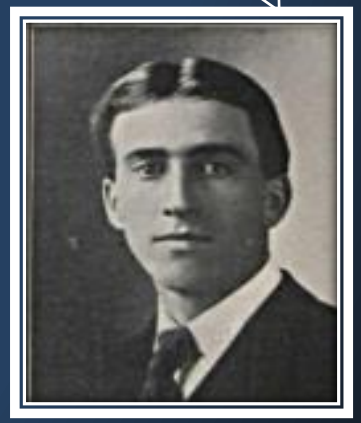


Dr. F.A. Thompson (5th)
1928-1950

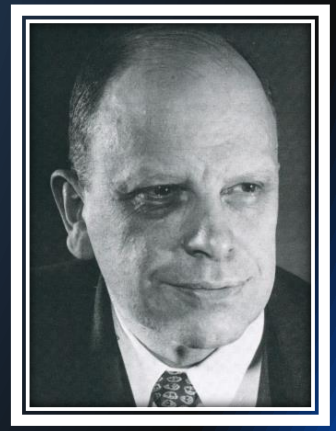
Thompson's comment when he arrived in 1928 is often quoted "ugliest campus of any educational institution in any of the continents"

Adami came to the School of Mines in 1907 as an instructor in metallurgy, math, and geology. He was the Montana State School of Mines first Vice President in 1928. He "served as acting President on three occasions".

The Magma "reported that Adami had taught every course ever offered at the Mines!"



Dr. A.E. Adami
(Acting President)
1950-1951



Dr. J. R. Van Pelt (6th)
1951-1956

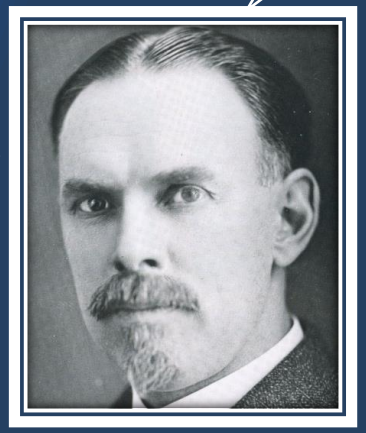
Dr. Van Pelt was a member and leader of many National Professional organizations, i.e., he was chairman of the Montana Section of AIME and was chairman of the Mineral Technology Division of the AIEE)

Detailed backgrounds in McGlynn's book

Thomson's comment when he arrived in 1928 is often quoted "ugliest campus of any educational institution in any of the continents"

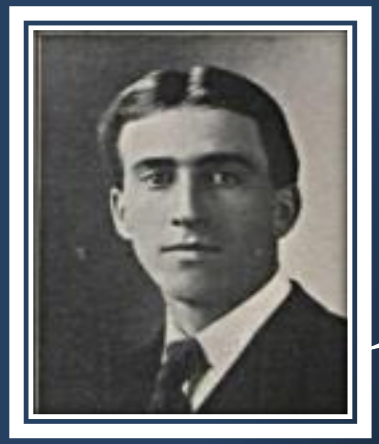
Taught some Metallurgy Courses

Thompson was very popular with the students, townspeople and especially politicians



Dr. F.A. Thomson (5th)

1928-1950 (**22** years)



Prof. A.E. Adami (Acting President 3 times)

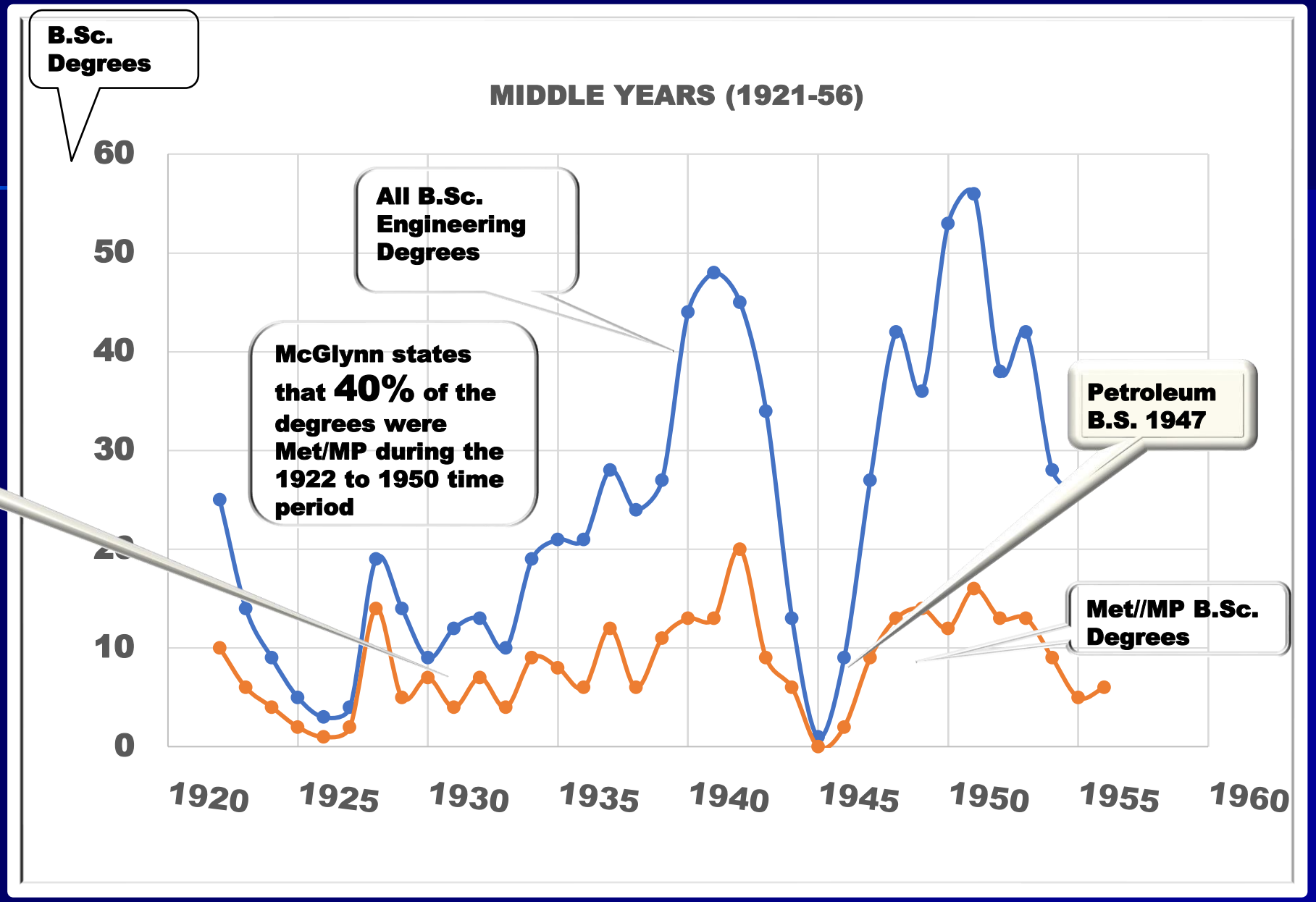
Adami came to the School of Mines in 1907 as an instructor in metallurgy, math, and geology. He "served as acting President on three occasions". He served the MSM for **51** years.

Accomplishments:

- Added 5 new buildings
- Initiated the "Reconversion Plan" Committee (1945)
- Many beautification projects
- He made sure that all graduates were employed

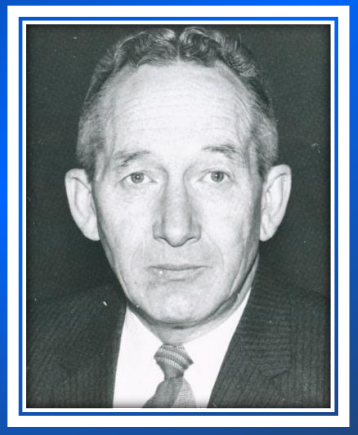
Strong supporter of more B.S. Degrees. Met, M.D, Geological and Pet M.S. Degrees started during his tenue.

Taught some Metallurgy Courses


B.Sc. Degrees
MIDDLE YEARS (1921-56)
60
50
40
30
10
0
1920
1925
1930
1935
1940
1945
1950
1955
1960
All B.Sc. Engineering Degrees
McGlynn states that 40% of the degrees were Met/MP during the 1922 to 1950 time period
Geological B.S. 1929
Petroleum B.S. 1947
Met//MP B.Sc. Degrees

Montana Technological University History: The *Challenging* Years (1957-?)

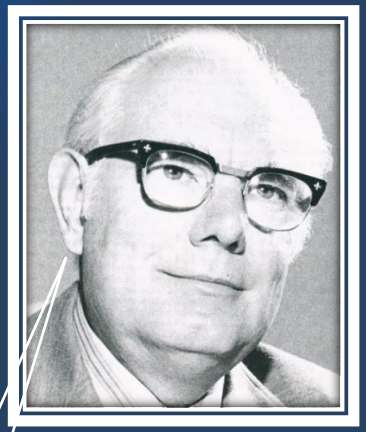
Presidents and Chancellors



Dr. E.G. Koch (7th)
1957-1971

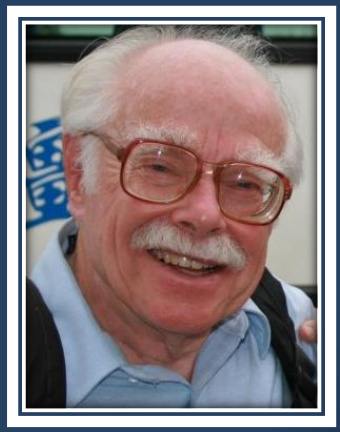
The Montana School of Mines name was changed to Montana College of Mineral Science and Technology in January 1965

K. McLeod
(Acting President)
1971-1972



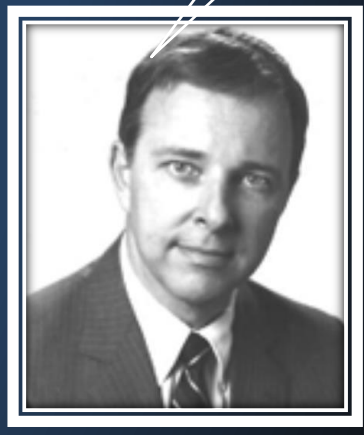
Dr. F.W. DeMoney (8th)
1972-1985

Metallurgy



Dr. I. Dayton
(Acting President)
1985-1986

Metallurgy



Dr. L.E. Norman (9th)
1986-1998

Chancellor W.F. Gilmore (10th)
1998-2011

First to be designated "Chancellor"; all previously were designated "President"

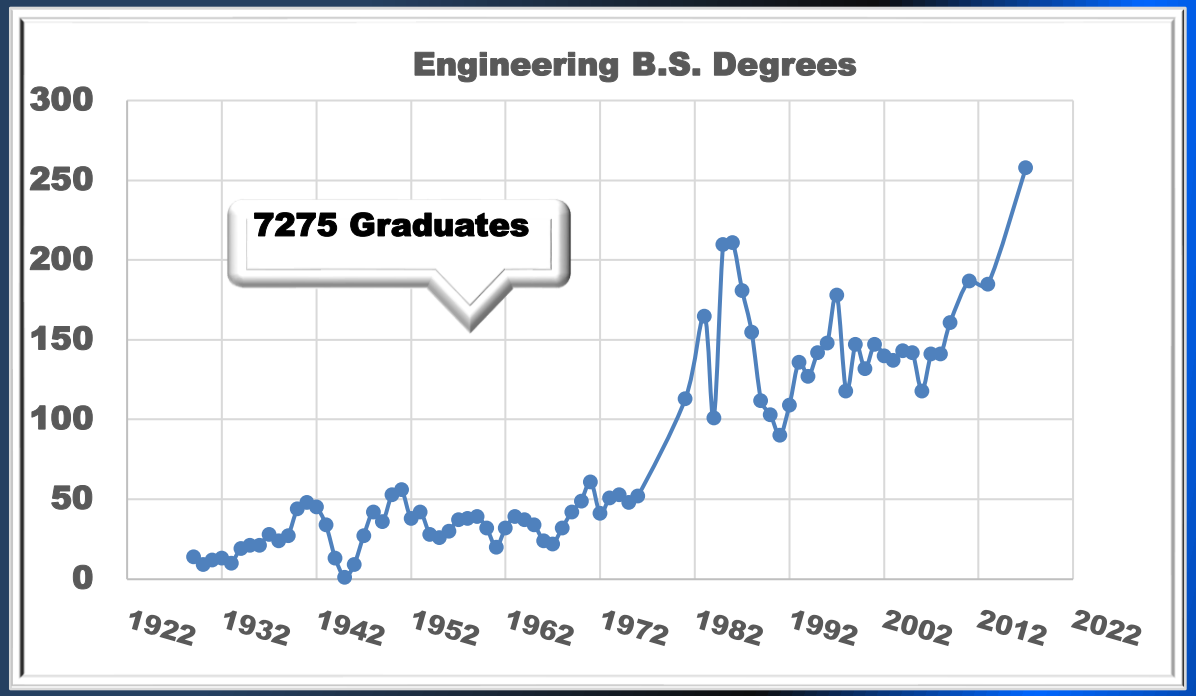
Chancellor D.M. Blackketter (11th)
2011-2019

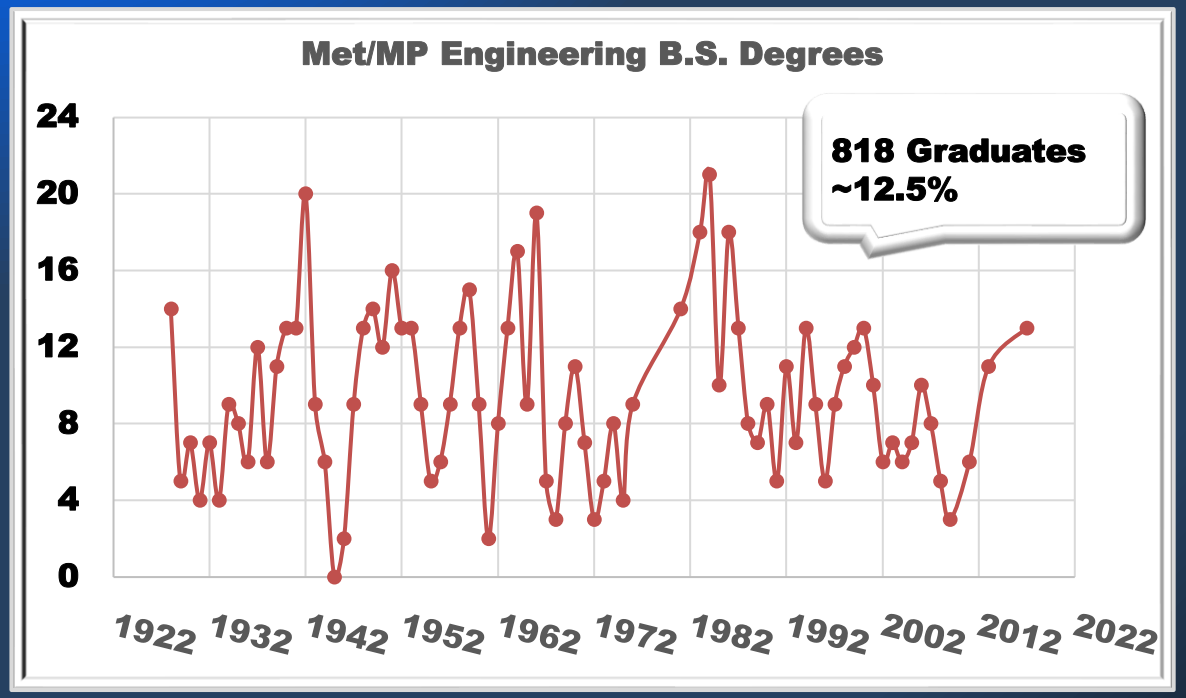
Chancellor L.P. Cook (12th)
2019-2022

14 presidential Leaders

ALL YEARS (1922-2021)

B.S. Student Statistics





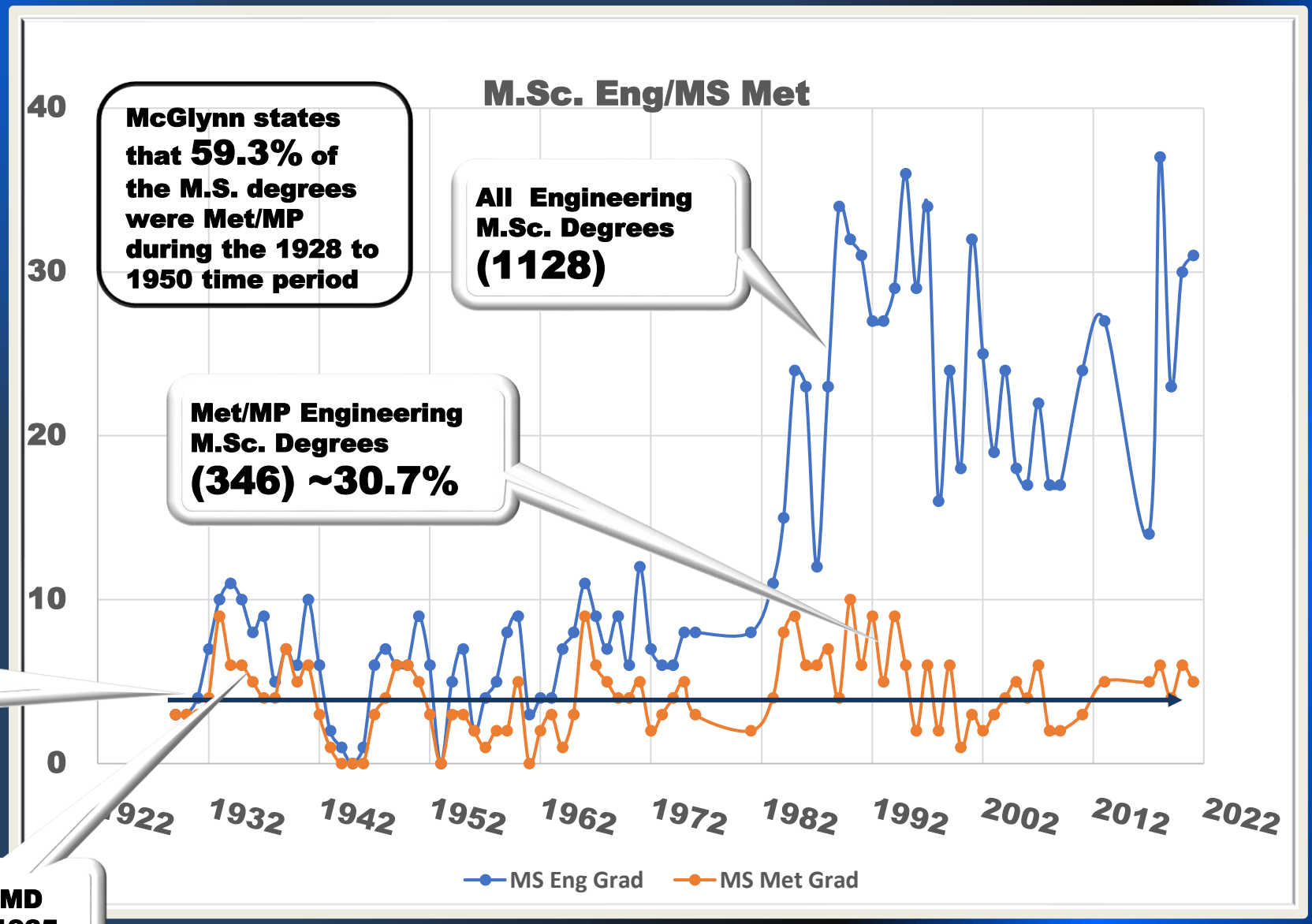
M.Sc. Student Statistics

ALL YEARS (1928-2021)

Jerry will discuss the relatively new PhD degree

M.Sc. in Met, Mining, and Geology started 1928

M.Sc. in MD started 1935



TOTAL
B.Sc./M.Sc.
Metallurgy/Mineral
Processing Graduates
(100 Years)

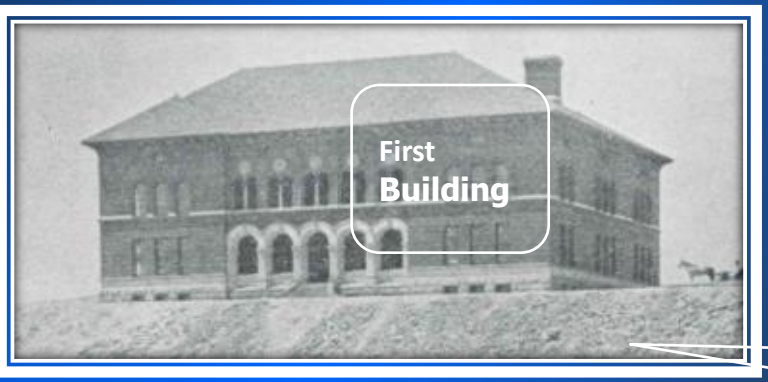
1164

[818 B.Sc. (12.5%), 346 M.Sc. (30.7%)]

TOTAL Metallurgy/Mineral
Processing Faculty

95

More History



School of Mines Building (construction 1896-1900)
Later renamed "Main Hall"

Classes started September 11, 1900. Twenty-one students; five faculty.

Gymnasium Building (1908-1910)
The Gymnasium was remodeled in 1923 and was renamed the Engineering Hall Building Building.

These buildings were connected by a tunnel system

New Metallurgy Building
- Metallurgy First floor
- Chemistry Second floor
- Ore Dressing Lower floor

(1923 to 1987)

Metallurgical Building (1908)
Later renamed "Mill Building"
This building housed the Ore Dressing and Metallurgical Labs

Student Army Training Corps Barracks (1919); a wooden structure that is now gone.

Wreckage of Metallurgy Building floor slab collapse, 1920.

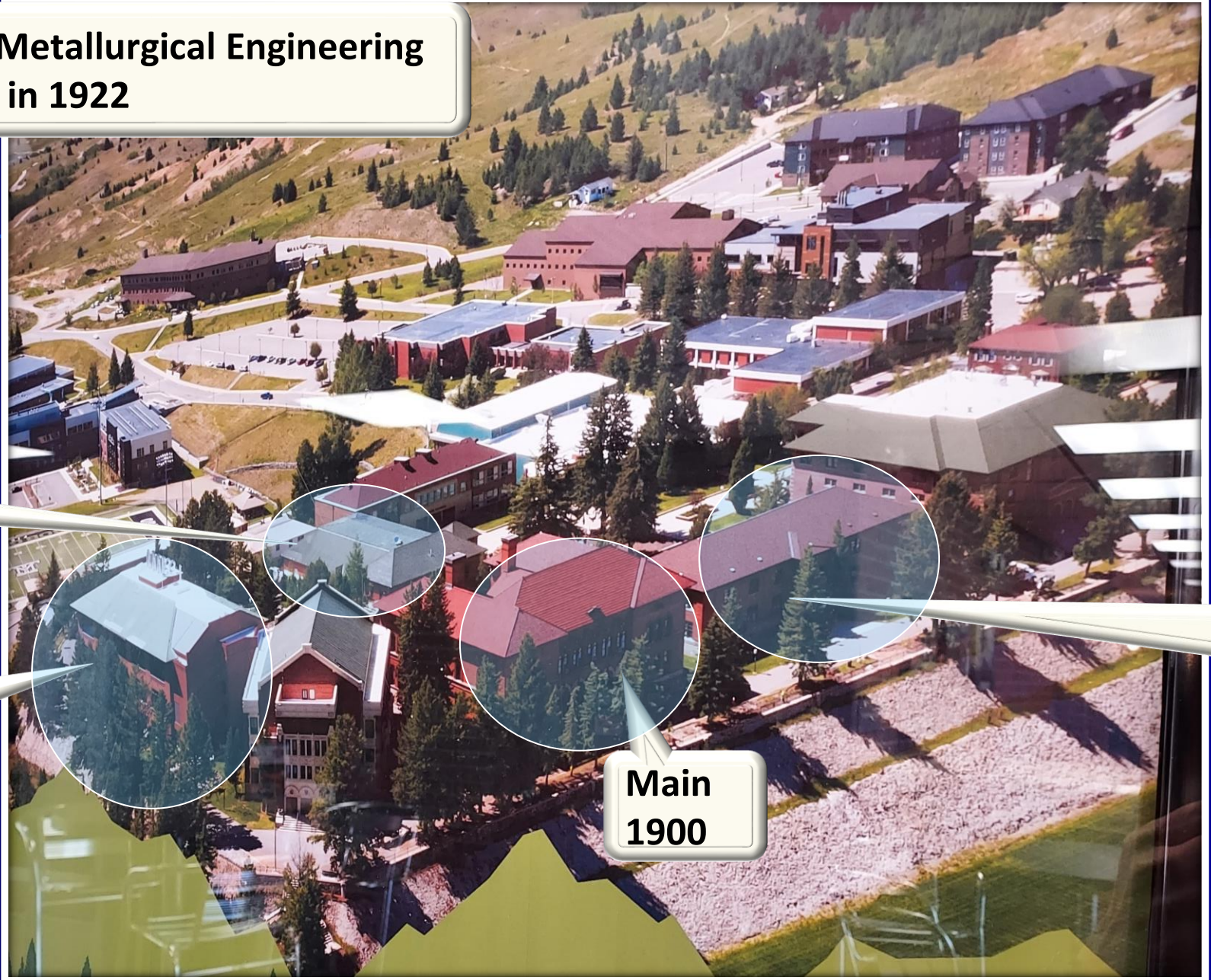
Construction of the "Metallurgy" building in 1920 Causse not determined.

Rebuilding 1920-1925

Building had classrooms, laboratories for metallurgy, ore dressing and chemistry. Classes started in 1923

Metallurgy Building (1923). Now remodeled as the "Chemistry and Biology" Building

Buildings when Metallurgical Engineering B.S. was started in 1922



Mill 1908

Metallurgy 1923

Main 1900

Original Gym now Engineering Hall 1923

Montana Technological University Name Changes

Montana State School of Mines (1900-1919)

State School of Mines (1919-1928)

Montana School of Mines (1928-1965)

Montana College of Mineral Science and Technology (MCMST) (1965-1994)

Montana Tech of The University of Montana (1994-2017)

Montana Tech Special Focus University (2017-2019)

Montana Technological University (2019-2022)

School of Mines Building (1896-1900)
Later renamed "Main Hall"

ELC (Metallurgy Building) 1987-2022

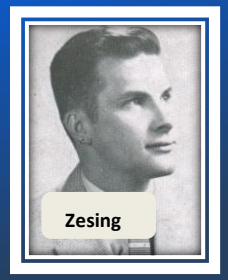
Metallurgy Building had classrooms, laboratories for metallurgy, ore dressing and chemistry in 1923-1987

History of the Metallurgical/Mineral Processing Engineering Program Name Changes

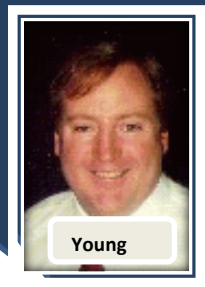
Department Name Changes

Metallurgical Engineering Degree Established (1922)

Metallurgical/Mineral Processing Engineering (1977)



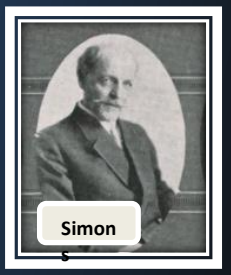
Metallurgical Engineering (1990)



Metallurgical and Materials Engineering (2000)

Mineral Processing Name Changes

Ore Dressing was a topic covered in Mining Engineering (1900-1922)



Ore Dressing became an option in Metallurgical Engineering Program (1922)

M.Sc. Degree was established (1935)

Mineral Dressing Engineering B.Sc. Degree Established (1963)

Mineral Dressing name changed to Mineral Processing Engineering (1975)

Mineral Processing Engineering combined with Metallurgical Engineering (1977)

Our own DEGREE

Milestones

Engineer of Mines E.M. Degree (1900-1922)

Metallurgy Building Constructed (1917-1923)

New Metallurgy Building had classrooms, laboratories for metallurgy, ore dressing and chemistry in 1923-1987

Metallurgical Engineering B.S. Degree Established (1922,1st Graduates 1923)

First students to receive a B.S. degree in Metallurgical Engineering 1923 were: Ellis Frink and W.W. Mowbray

Horace T. Mann First Metallurgy Department Head (1922)

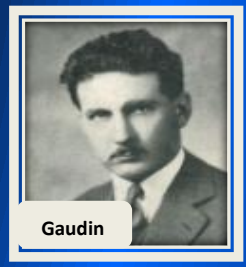
Then Curtis Wilson was Head for 20 years

First Metallurgical Engineering Curriculum Published (1922)

MSM faculty 14 Seniors 23 (met and mining) No more E.M. degrees granted

M.S. Degree in Metallurgical Engineering Established (1928)

Antoine Gaudin joined the Ore Dressing Department (1928)



Gaudin

Gaudin

M.S. Degree in Ore Dressing Established (1935)

Still no B.S. For MD

Montana School of Mines received their FIRST NATIONAL ACCREDITATION in METALLURGY, MINING AND GEOLOGY (1937)

This was a big deal!!

Milestones

Reconversion Plan Established (1945)

Very big deal!! Changed the direction of the Engineering programs

The Mineral Dressing option became the Mineral Processing B.S. degree (1963)

Finally MP became a B.S. Degree!!

Name later changed to Mineral Processing in 1975

Blue Ribbon Commission Study Draft Report (1974)

The College almost became a Junior College; all engineering was to be transferred to MSU

The Metallurgy/Mineral Processing Engineering Department was established (1977)

Each program continued granting separate degrees (1977-1990)

The separate Mineral Processing Degree was discontinued

Metallurgical/Mineral Processing Engineering Degree became the Metallurgical Engineering Degree (1990)

Students could still take an emphasis in Mineral Processing

The Metallurgical/Materials Engineering Degree was established (2001)

The Material Science Doctorate degree was approved by the Board of Regents (2014)

The University's name was changed to MONTANA TECHNOLOGICAL UNIVERSITY (2019)

History of the Program and Department Heads for Metallurgy

Metallurgy Faculty = 76

William G. King (A.M.)
Prof. of Chemistry and Metallurgy
1900-1906

Frederick Laist (B.S.)
Prof. of Chemistry and Metallurgy
1907-1908

Alex Gilfillan (B.S. C.E.)
Prof. of Metallurgy and Chemistry
1908-1909

Charles H. Bowman (M.S.)
President and Prof. of Metallurgy
1909-1913

Bancroft Gore (PhD)
Prof. of Metallurgy
1913-1918

H.B. Pulsifer (B.S. M.S. ChE)
Prof. of Metallurgy
1918-1919

Horace T. Mann (B.S. M.S.)
Prof. of Metallurgy
1919-1923

Curtis L. Wilson (E.M. PhD)
Prof. Metallurgy
1921-1941
[Instructor (1921-1923)-Assistant Prof, (1923-1925), Associate Prof. (1926-1927), and Prof. (1928-1941)]

Frederick C. Gilbert (B.S.)
Prof. of Metallurgy
1927-1929

Curtis L. Wilson (E.M. PhD)
Prof. Metallurgy
1929-1941

John P. Spielman (B.S.)
Prof .of Metallurgy
1941-1949

J. George Grunenfeider (B.S. M.S. DSc.)
Prof of Metallurgy
1949-1952

Frederick A. Hames (B.S. M.S., PhD)
Prof. of Metallurgy
1952-1957

Charles W. Haynes (B.S. M.S. DSc.).
Associate Prof. of Metallurgy
1957-1960

Vernon Griffiths (B.S. M.S. ScD.)
Associate Prof of Metallurgy
1960-1965; Prof. Metallurgy
1965-1975

Gordon F. Ziesing (B.S. M.S.)
Associate Prof of Metallurgy and Mineral Processing
1975-1980.

Larry G. Twidwell (B.S. M.S. D.Sc.) Prof. of Metallurgy
1980-1983.

Vernon Griffiths (B.S. M.S. ScD.)
Prof of Metallurgy
1984-1986

Theodore S. Jordan (B.S. M.S.)
Prof. of Metallurgy
1986-1995.

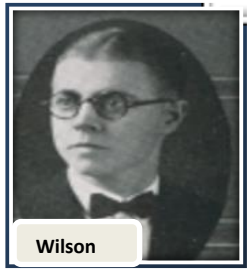
Samuel Worcester (B.S. M.S.)
Prof. of Metallurgical Engineering
1995-1998

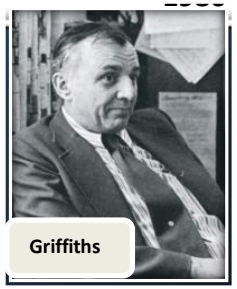
Courtney A. Young (B.S. M.S. PhD)
Associate Prof. of Metallurgical Engineering
1998-2000; Prof. Metallurgical Engineering 2000-2020

Jerome P. Downey (B.S. M.S. PhD)
Prof. of Metallurgical Engineering
2020-2022

Department Head Longevity (years)
Young 22
Wilson 20
Griffiths 12


Young


Wilson


Griffiths

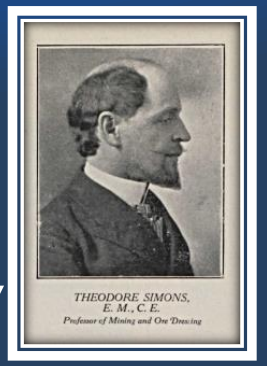
21 Program and Department Leaders
1900-2022
Twidwell #17
Downey #21

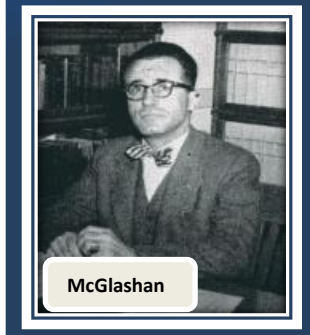
History of the Program and Department Heads for Ore Dressing, Mineral Dressing, and Mineral Processing

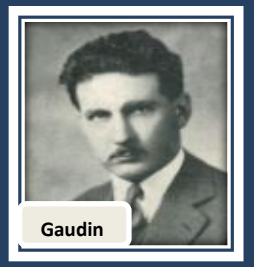
8 Program and Department Leaders 1900-2022

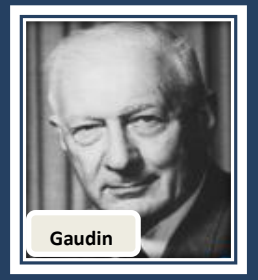
Faculty in Ore Dressing, Mineral Dressing, Mineral Processing = 19

Longevity (years)
Simons 21
McGlashan 21
Gaudin 11









Charles H. Bowman (M.S.)
Prof. of Mechanics and Mining
1900-1904

E.H. McDonald (E.M.)
Prof. of Mining
1904--1906

Theodore Simons (E.M. C.E.)
Prof. of Mining and Ore Dressing
1907-1928

Antoine Marc Gaudin (B.S. E.M.)
Research Prof. of Ore Dressing
1928-1939

S.R.B. Cooke (B.S. M.S. PhD)
Research Prof. of Mineral Dressing
1939-1946

Donald W. McGlashan (B.S. M.S.)
Associate Research Prof. of Mineral Dressing 1946-1950
Research Prof. 1950-1967
Vise President and Director of Research 1967-1975

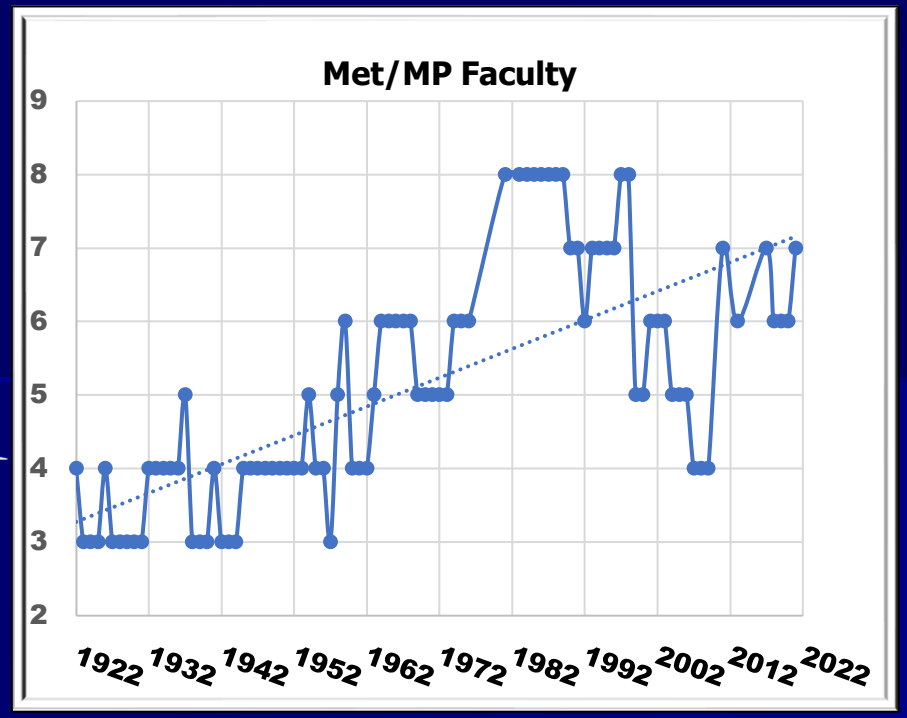
Gordon F. Ziesing (B.S. M.S.)
Associate Prof. of Mineral Processing
1975-1977.

The Mineral Processing Engineering Program Merged with Metallurgical Engineering to become the Department of Metallurgy and Mineral Processing Engineering in 1977.

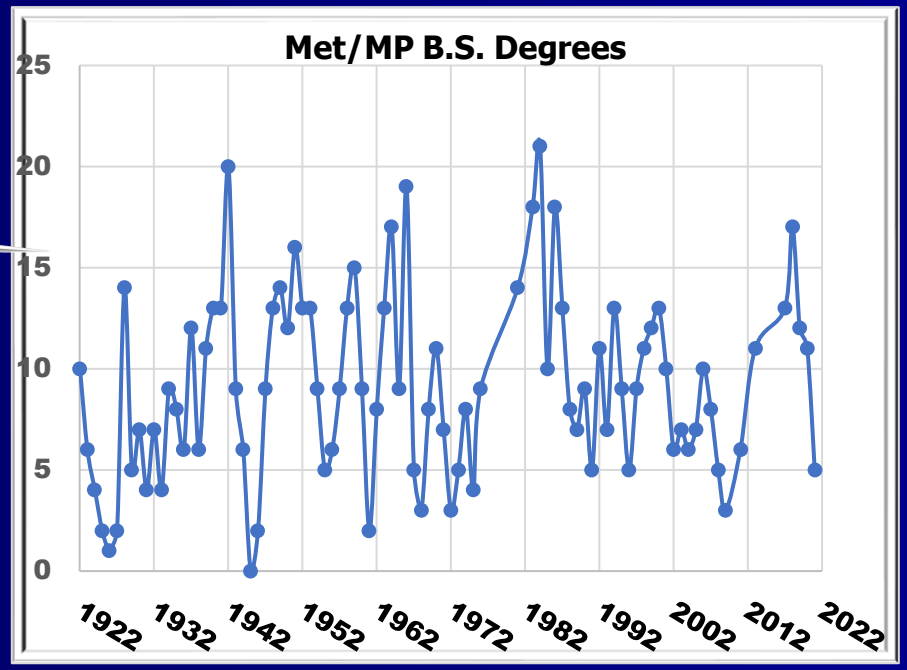
Gordon F. Ziesing (B.S. M.S.)
Associate Prof. of Mineral Processing
Gordon Ziesing then served as the Head of the Metallurgy and Mineral Processing Department
1977-1980

Gordon F. Zucker (B.S. M.S. D.Eng.Sc)
Associate Prof. of Metallurgy and Mineral Processing and Coordinator of Mineral Processing Engineering Program
1980-1986

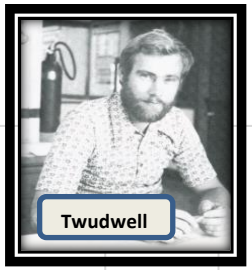
Total Met/MP Faculty 95

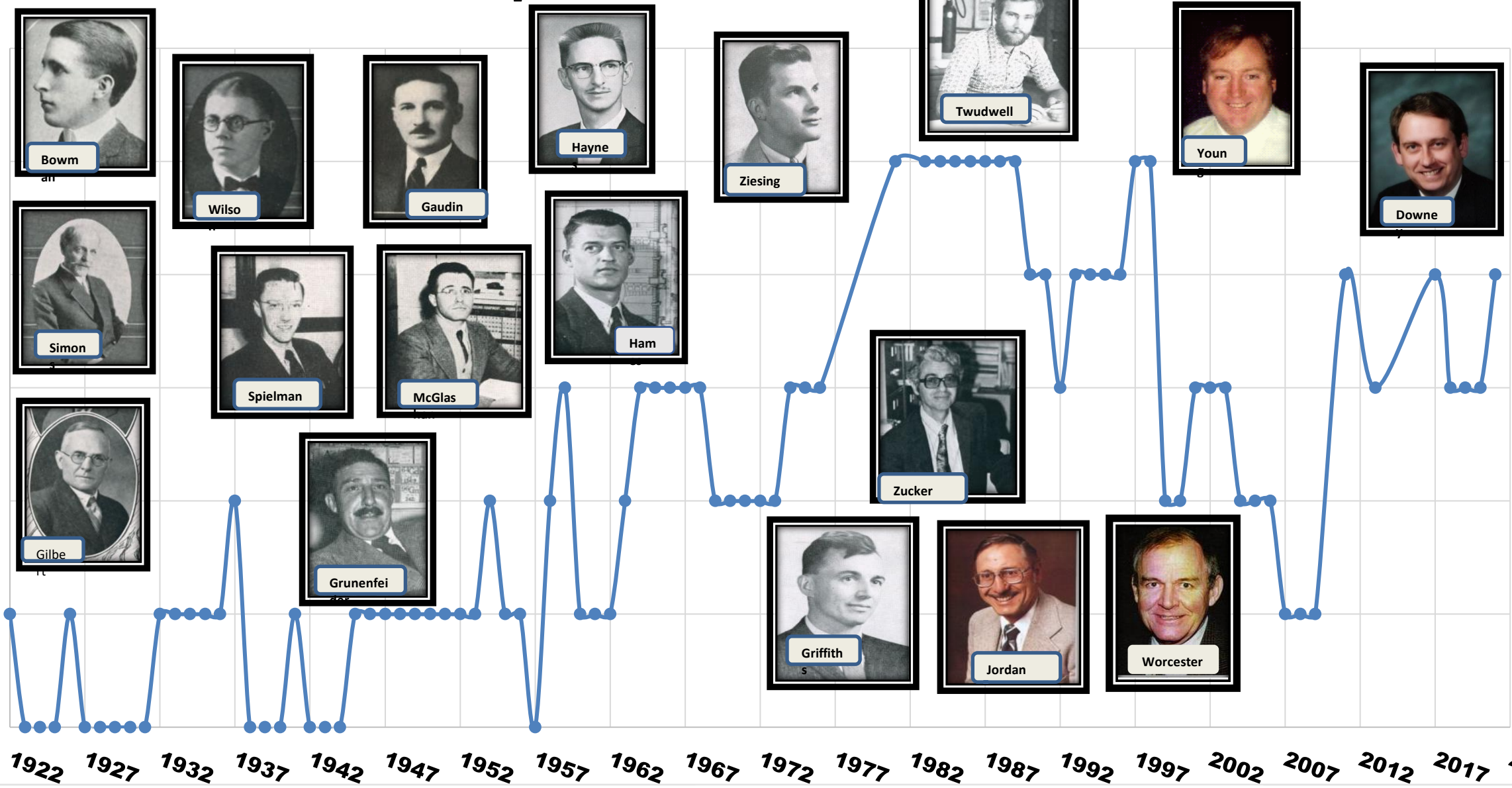


Total Graduates = 818



Met/MP Department Heads





A subset of our B.Sc. and M.Sc. Degree recipients

Some of these photos are 4 decades old: see yourself??

MONTANA
TECHNOLOGICAL UNIVERSITY

Montana Tech Metallurgical/Materials Engineering
Centennial Celebration
(1922-2022)

History of the Metallurgy/Mineral Processing Programs (Jerry's Presentation follows)

(1900-2022)

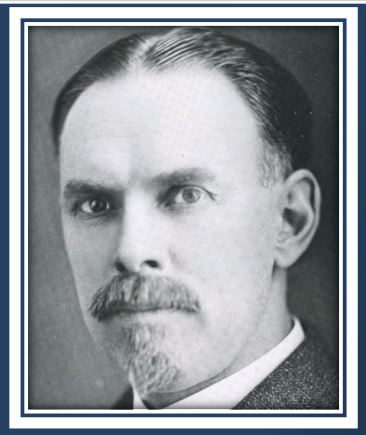
J.P. Downey, D.Sc.
Professor and Head
Metallurgical/Materials Engineering Department
School of Mines

L.G. Twidwell, D.Sc.
Emeritus Professor
Metallurgical/Materials Engineering Department
School of Mines

Extra Slides Follow

RECONVERSION PLAN (AS DISCRIBED BY McGLYNN)

In 1945 "President Thompson reached what was to be the most important milestone in the history of Mines". "He embarked on a program that was destined to modernize the Montana School of Mines curricula and thus chart new directions for the College in the future.



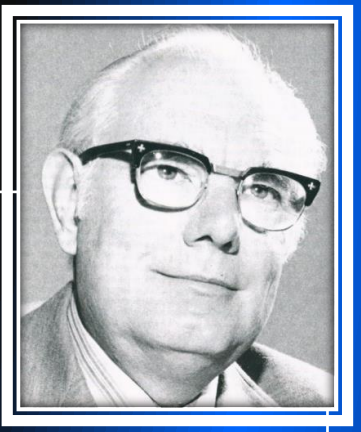
Dr. John Spielman chaired the "reconversion" committee (Metallurgy Department Head)

"what took place was a general freeing-up of curricula so that students had not only more technical electives but also more options in the humanities, economics, and social sciences. Thompson changed the picture".

The Plan for the Future of Montana School of Mines

- A engineering core was established: math, physics, mechanics, and hydraulics
- An "equally important trio" of English, History, and Economics was required, and
- More technical electives must be available to the student

Bule Ribbon Commission Study (1974)



Fred DeMoney was president when our college almost became a Junior college.

The Board of Regents commissioned a study (referred to as the "Blue Ribbon Commission") to determine if the College "was a viable minerals engineering institution".

The Commission's draft recommendation was "transfer engineering programs to Montana State University thus making Montana Tech into a junior college".

Dr. DeMoney mobilized local and national companies and influential people (e.g. Mike MansfieLd to protest the move).

The recommended move was not accepted by the Board of Regents.

Curricula

COURSES IN “Engineer of Mines” Degree

Freshman Year.

First Term.

Higher Algebra	5
Geometry	4
General Chemistry	8
Drawing	15

Second Term.

Higher Algebra	5 for 10 weeks
Surveying	5 for 10 weeks
Trigonometry	4
Descriptive Geometry	4
Drawing	6
Qualitative Analysis	9

Six Weeks' Vacation Work in Surveying.

Sophomore Year.

First Term.

Analytical Geometry	5
Mineralogy	7
Physics	5
Quantitative Analysis—Laboratory	9
Mechanical Drawing	4

Second Term.

Differential Calculus	5
Mineralogy	7
Physics	7
Quantitative Analysis	9
Drawing	3

7

Junior Year.

First Term.

Integral Calculus	5
Geology	5
Mechanics	2
Metallurgy—Lectures and Recitation	3
Machine Design and Drawing, half term	9
Assaying, half term	9

Second Term.

Economic Geology	5
Metallurgy—Lecture	3
Metallurgy—Laboratory	9
Graphics	5
Mining Surveying	2
Mechanics	5

Vacation, Six Weeks' Mining Surveying.

Senior Year.

First Term.

Metallurgy	4
Petrography	7
Mining	5
Hydraulics	5
Mining and Metallurgic Design	6
Testing Laboratory	3

Second Term.

Metallurgy—Lecture and Excursions	5
Mining—Lecture and Excursions	5
Power Transmission	3
Steam Engine	3
Petrography	3
Mining Law—Lecture	1
Micro-Chemical Analysis	1
Thesis	9

8

All Student followed this curriculum(1900-1922)

Metallurgy and ore dressing lectures / labs were presented in the junior and senor years.
Excursions to mining and smelter facilities were required in the senior year (written reports required.)

CHEMISTRY AND METALLURGY DEPARTMENT 1900

Metallurgy Topics:
Assaying in Freshman Year
Copper, Lead, precious metals metallurgy and refining

Purification methods comparison of cyanide, chlorination, etc

Excursions to Montana smelters and refineries were required.
**Excursions were a part of the Metallurgy/Mineral Processing programs until 1972.

Curricula

COURSES IN METALLURGICAL ENGINEERING (1945)

Residents paid no tuition until 1950

First 2 years the same for all students
Junior and Senior years different for each degree
In 1900 the contact hours=342
in 1922 the required credits=138
In 1945 the required credits=158
In 1980 the required credits=138-139 (Met) and 143 (MP)

COURSES IN METALLURGICAL ENGINEERING

FRESHMAN YEAR

First Semester

	Hrs. of Exer.	Units
English Composition	3	2
Algebra	4	4
Trigonometry	4	4
General Chemistry:		
Lectures and Recitations	4 }	4
Laboratory	6 }	
Mechanical Drawing and Descriptive Geometry	9	3
	30	17

Second Semester

	Hrs. of Exer.	Units
English Composition	3	2
Analytical Geometry	3	3
Plane Surveying	3	3
Qualitative Analysis:		
Lectures and Recitations	4 }	5
Laboratory	9 }	
Mechanical Drawing and Descriptive Geometry	6	2
General Geology	2	2
	30	17

SOPHOMORE YEAR

First Semester

	Hrs. of Exer.	Units
Engineering English	2	2
Calculus	4	4
Physics	5	4
Mineralogy:		
Lectures	2 }	2
Laboratory	3 }	
Quantitative Analysis:		
Lectures	2 }	3
Laboratory	6 }	
Topographic Drawing	6	2
Plane Surveying. Field Work	4-wk.	2
	30	19

Second Semester

	Hrs. of Exer.	Units
Engineering English	2	2
Calculus and Analytical Mechanics	4	4
Physics	4	3
Mineralogy and Petrology:		
Lectures	2 }	3
Laboratory	6 }	
Quantitative Analysis:		
Lectures	2 }	4
Laboratory	9 }	
Mining	1	1
	30	17

JUNIOR YEAR

First Semester

	Hrs. of Exer.	Units
Engineering Economics	2	2
Geology	3	3
Principles of Metallurgy	2	1½
Metallurgy Laboratory	3	1
Fire Assaying	1	½
Physical Chemistry:		
Lectures	2 }	3
Laboratory	6 }	
Mechanics	4	4
Physics Laboratory	6	2
	29	17

Second Semester

	Hrs. of Exer.	Units
Engineering Economics	2	2
Geology:		
Lectures	3 }	4
Laboratory	3 }	
Metallurgy of Copper	3	3
Assaying	6	2
Electro Chemistry:		
Lectures	2 }	2
Laboratory	3 }	
Hydraulics	4	4
Graphics	3	1
	29	18

SENIOR YEAR

First Semester

	Hrs. of Exer.	Units
General Metallurgy:		
Lectures	3 }	6
Laboratory	9 }	
Ore Dressing:		
Lectures	2 }	4
Design	6 }	
Electro Metallurgy	3	3
Metallurgy Problems	3	3
Thermodynamics	2	2
	28	18

Second Semester

	Hrs. of Exer.	Units
General Metallurgy:		
Lectures	3 }	5
Laboratory	6 }	
Ore Dressing:		
Lectures	2 }	4
Design	6 }	
Physical Metallurgy:		
Lectures	3 }	4
Laboratory	3 }	
Metallurgy Problems	3	3
Power Transmission	2	2
	28	18

SOME OF OUR HONORED STUDENTS

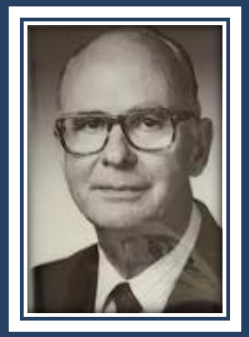
We honor our students and graduates; they honor us by their professional successes!

Come and see these plaques: ELC building, main floor hallway

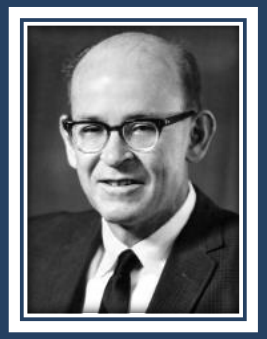
Antoine Marc Gaudin
1964
Professor Ore Dressing
Montana School of Mines
1928-1939
Founding Member of NAE

Terrance P. McNulty
2005
MSc Metallurgical Engineering
MCMST 1963

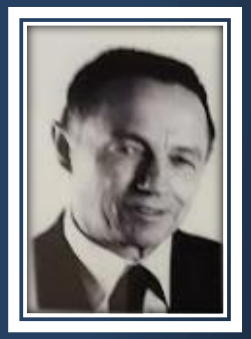
Robert Beebe
1990
BSc Mineral Dressing Engineering
Montana School of Mines 1953



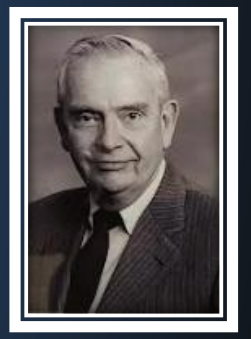
Douglas Fuerstenau
1976
MSc Mineral Dressing
Montana School of Mines 1950



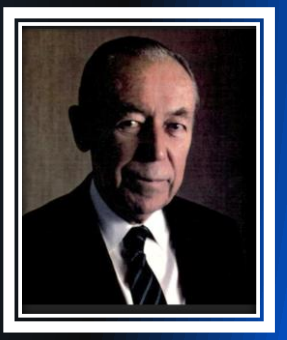
Reinhardt Schuhmann
2005
MSc Ore Dressing
Montana School of Mines
1934



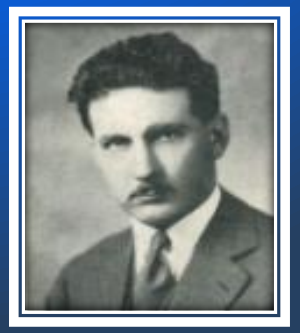
William Opie
1982
MSc Metallurgical Engineering
Montana School of Mines
1942

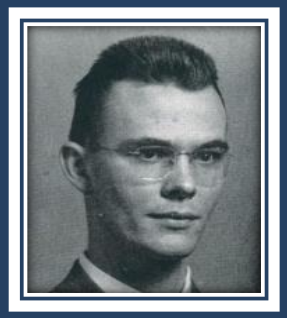


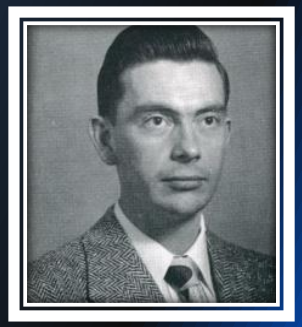
Frank Aplan
1989
MSc Mineral Dressing
Montana School of Mines 1950

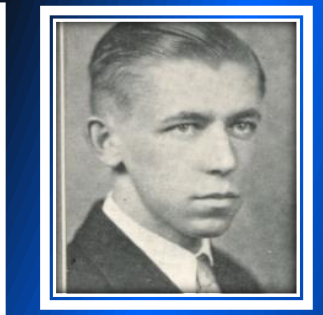


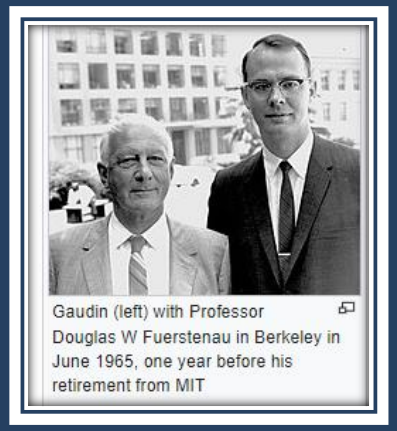
Plato Malozemoff
1969
MSc Metallurgical Engineering
Montana School of Mines 1932



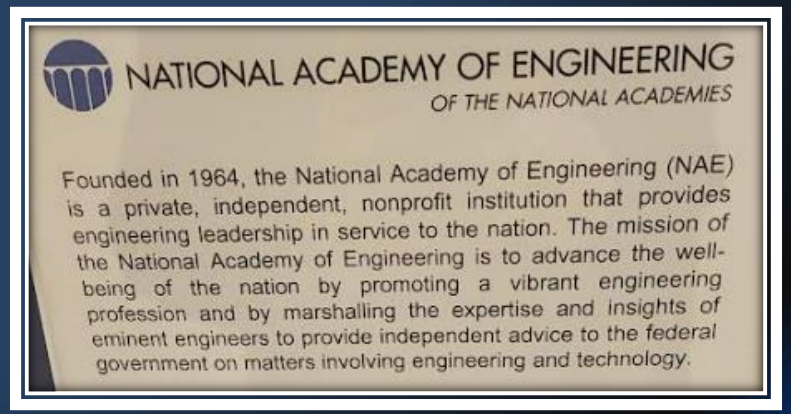








Gaudin (left) with Professor Douglas W Fuerstenau in Berkeley in June 1965, one year before his retirement from MIT



NATIONAL ACADEMY OF ENGINEERING
OF THE NATIONAL ACADEMIES

Founded in 1964, the National Academy of Engineering (NAE) is a private, independent, nonprofit institution that provides engineering leadership in service to the nation. The mission of the National Academy of Engineering is to advance the well-being of the nation by promoting a vibrant engineering profession and by marshalling the expertise and insights of eminent engineers to provide independent advice to the federal government on matters involving engineering and technology.

Maybe use pics

MONTANA STATE SCHOOL OF MINES

THE FACULTY

CHARLES S. BOWMAN, M. S. - - - - - - - - Iowa, Chicago
President and Professor of Metallurgy

GEORGE W. CRAVEN, B. S. - - Massachusetts Institute of Technology
Professor of Mathematics and Mechanics

THEODORE SIMONS, E. M., C. E. - - - - - - - - Freiberg
Professor of Mining Engineering

DARSIE C. BARD, A. B. - - - - - - - - - - Harvard
Professor of Geology and Mineralogy

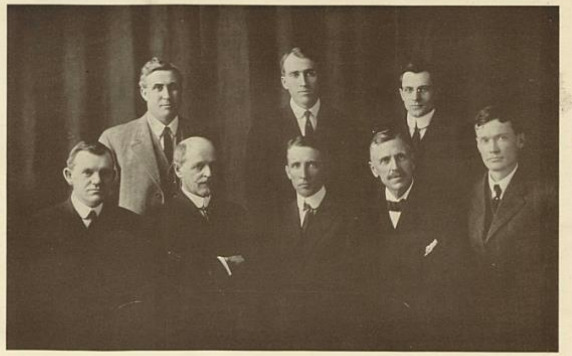
LESTER J. HARTZELL, E. M. - - - - - Colorado School of Mines
Professor of Chemistry

EDWARD B. HOWELL, A. M., LL. B. - - - - - Grinnell, Iowa
Lecturer on Mining Law

ARTHUR E. ADAMI, E. M. - - - - - Montana School of Mines
Assistant Professor of Mining Engineering

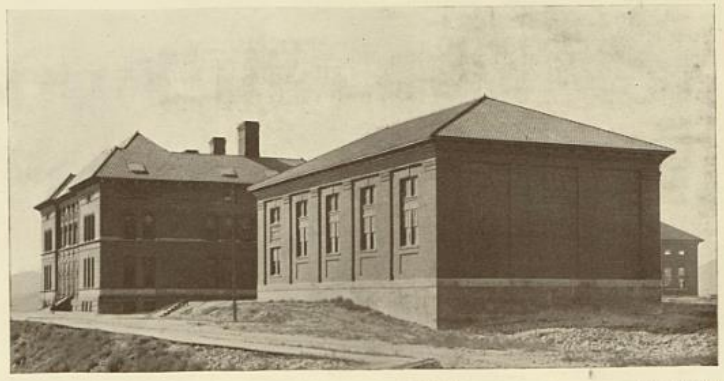
EARLE B. YOUNG, A. M. - - - - - - - - - Wisconsin
Instructor in Mathematics and Mechanics

MONTANA STATE SCHOOL OF MINES



TOP ROW—L. J. HARTZELL, A. E. ADAMI, E. B. YOUNG
BOTTOM ROW—G. W. CRAVEN, THEODORE SIMONS, C. H. BOWMAN, E. B. HOWELL, D. C. BARD

MONTANA STATE SCHOOL OF MINES



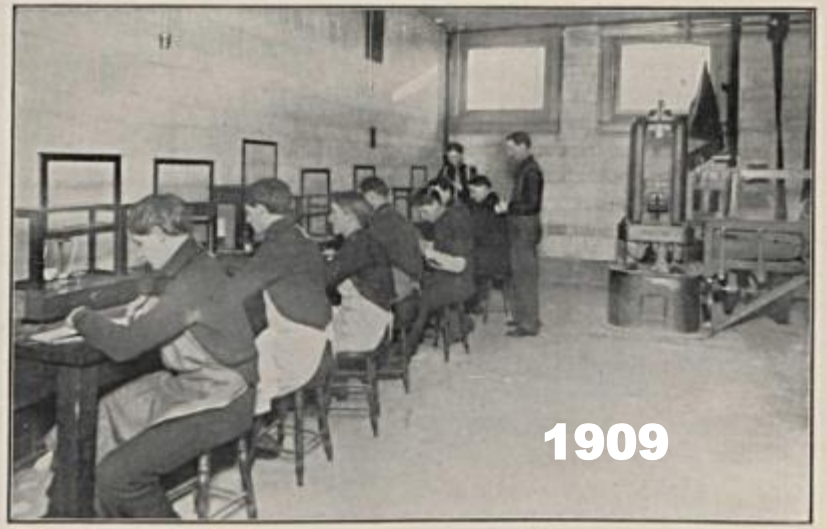
MAIN BUILDING GYMNASIUM MILL BUILDING

1909

The enormous production of ore has given rise to the development of some of the largest and best equipped copper smelters in the world. Among these are the Washoe smelter at Anaconda, the Boston and Montana smelter at Great Falls, and the Butte Reduction Works at Butte. The Washoe smelter has a capacity for handling 10,000 tons of ore daily and is the largest smelter of its kind in the world. The Great Falls smelter has an electrolytic refining plant, the only one in the West. This smelter, under the able management of Mr. C. W. Goodale, has been one of the pioneers in solving the complicated metallurgical problems presented by the Butte copper ores. Within easy reach is also the East Helena smelter. This smelter is the property of the American Smelting & Refining Co. It treats chiefly lead and silver ores.

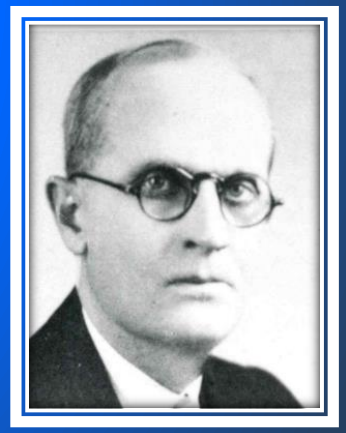
Such are the industrial developments within the city of Butte and adjoining districts, the environments of the Montana State School of Mines. Being brought daily into contact with the various phases of mining, milling and smelting, and with the men who are personally engaged in the different departments of these industries, the student cannot help absorbing considerable practical information which is a great advantage to him in subsequent practice. In this respect the opportunities offered the students are unsurpassed in this country. Virtually all of the mines and mining plants form a substantial part of the equipment of the school; the great mining companies as well as the smelter operators and individual miners give cordial assistance to the students in facilitating their studies. Moreover many of the students find remunerative employment in the various mines during vacation. The great practical advantage thus accruing to the student of the Montana School of Mines cannot be overestimated.

Montana State School of Mines Building.



Balance and Testing Room.

More Early History



Louis V. Bender First
E.M. Graduate
June 1903

The Montana State School of Mines was constructed in 1896-7. Classes started in September 11, 1900. The only degree available was the Engineer of Mines (E.M.). There weve 17 freshmem, 3 sophomores, and 1 Junior. 18 students were admitted to Special or Preparatory classes. The first graduate was Lois V. Bender (1903).

The only other School of Mines was Michigan School of Mines (1885) and the Colorado School of Mines (1870). The Montana State School of Mines had the largest initial enrollment of all the other School of Mines.

In 1929 Master of Science degrees were initiated in three areas: Mining Engineering, Metallurgical Engineering and Geological Engineering.

A M.S. in Mineral Dressing was added in 1935 (previously courses were given in "Ore Dressing" as a part of the Mining Engineering classes, but a B.S. degree in Mineral Dressing was not designated until 1963). Walter Vogeno was the first Mineral Dressing M.S. recipient (1936).

During the period 1929-1950 there were 130 graduate degrees; 40% were Metallurgical Engineering, 19% were Mineral Dressing Engineering.

First Faculty 1900

FACULTY OF THE MONTANA STATE SCHOOL OF MINES.

NATHAN R. LEONARD, A. M.,
President and Professor of Mathematics.

WILLIAM G. KING, A. M.,
Professor of Chemistry and Metallurgy.

ALEXANDER N. WINCHELL, Doct. Univ. Paris,
Professor of Geology and Mineralogy.

CHARLES H. BOWMAN, M. S.,
Professor of Mechanics and Mining Engineering.

LEON R. FOOTE, B. L.,
Teacher of Conditional Classes.

*.....
Charles W. Clark Professorship of Mining Engineering.

* Not yet filled.

First students to receive a B.S. degree in Metallurgical Engineering 1922 were:
Ellis Frink and
W.W. Mowbray
The B.S. degree in Geological Engineering was established in 1927.

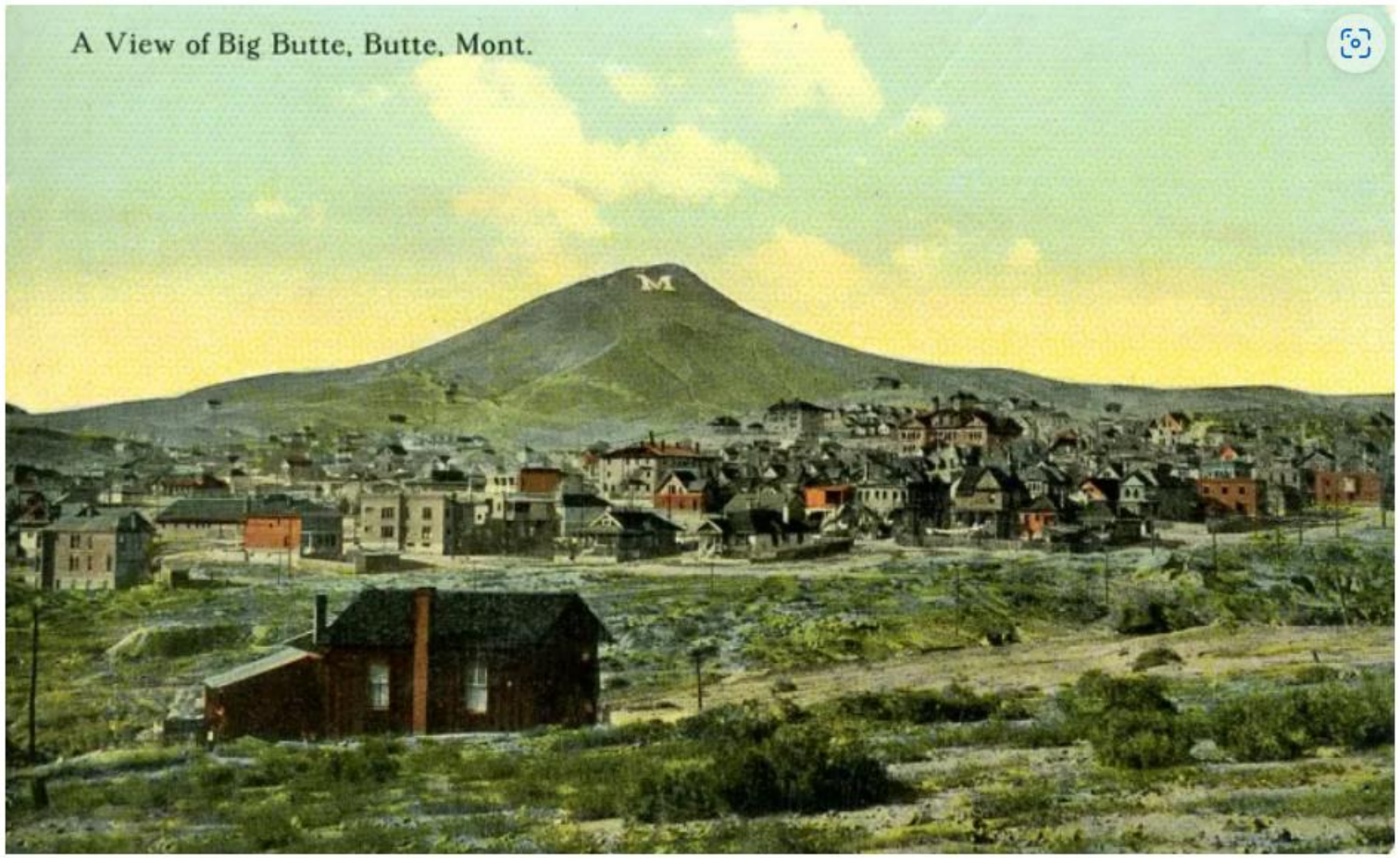
The first National Engineering Accreditation was granted in 1937 for the Mining, Metallurgy, and Geology Programs.

In 1963 a B.S. in Mineral Dressing was designated (Previously Mineral Dressing was an option in the Metallurgy Program 1947-1963).

In 1975 the Mineral Dressing name was changed to Mineral Processing Engineering and the program was merged (in 1977) with Metallurgical Engineering to become the Department of Metallurgical and Mineral Processing Engineering.

However, B.S. degrees in Metallurgical Engineering and Mineral Processing Engineering continued.

1978 the first graduates in Mineral Processing Engineering included: Paul Balo, Dan Dysinger, Doug Glaspey, Tracey Morris, Ed Orzechowski, Doug Poush, and Reggie Theault.



Big Butte's Big M

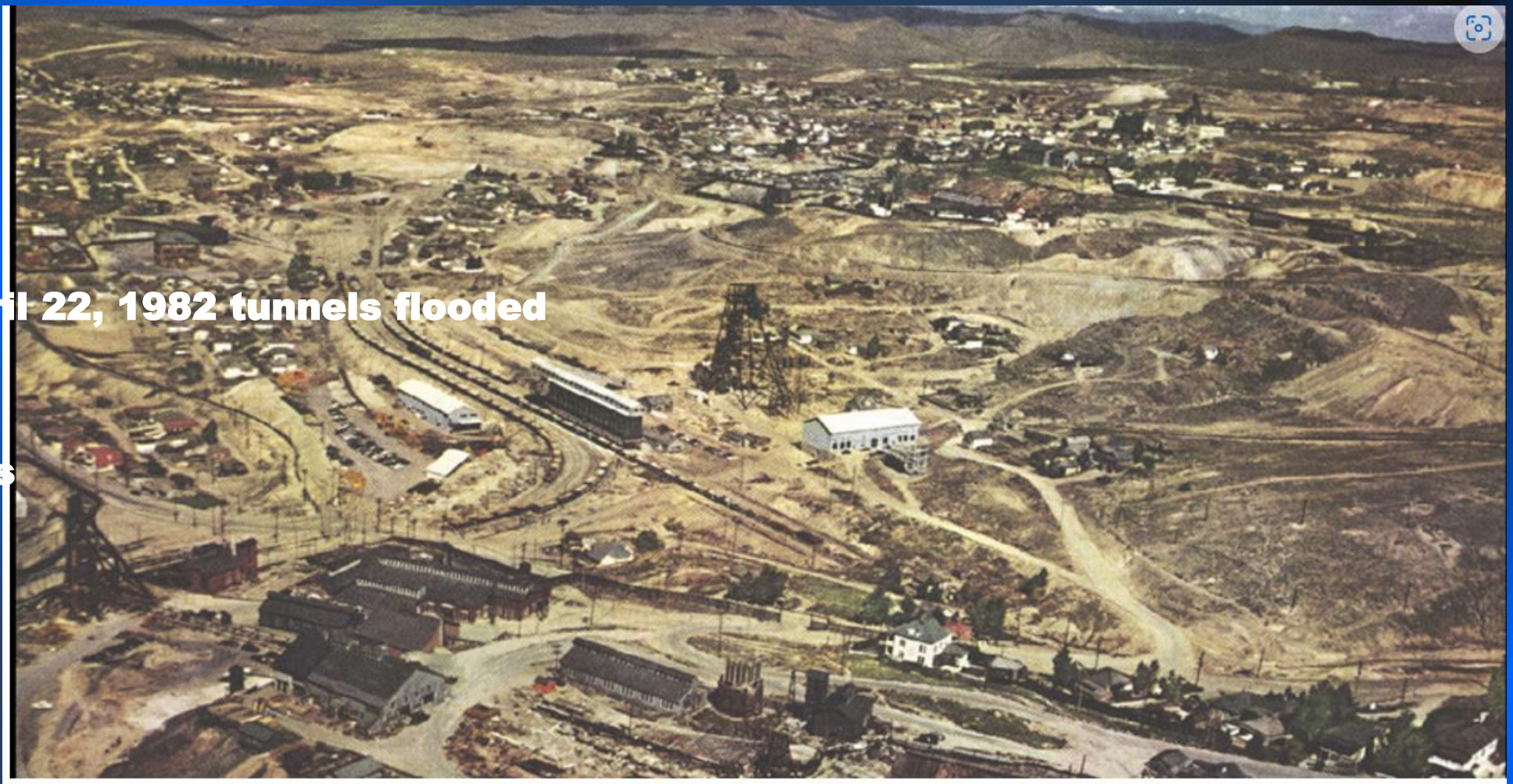
1910

Wikipedia

April 22, 1982 tunnels flooded

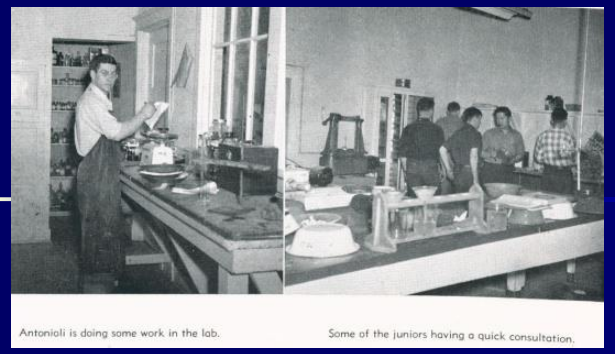
10,000 Miles

Pit Watch



The future site of the Berkeley Pit in Butte, Montana as it appeared in 1952.

1955-1982: Berkeley Pit history



Antonioli is doing some work in the lab.

Some of the juniors having a quick consultation.


2006