DMA Form 1

DEFENSE MINERALS ADMINISTRATION
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Routing Slip

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what
it
is

BATTELLE

how it operates

"The future of the world lies in the hands of those who are able to carry the interpretations of nature a step further than their predecessors."—Huxley.

what it is . . .

Battelle Institute was founded by the will of Gordon Battelle as a memorial to the Battelle family. The Battelles were among the first settlers of Ohio and were prominent in the development of the state's iron and steel industry. Gordon Battelle, last of the family line, was impressed with the benefits to be derived from industrial research and left his estate for the building and endowment of an Institute "for the purpose of education . . . the encouragement of research . . . and the making of discoveries and inventions for industry". The Institute began operations in 1929.

As established, Battelle provides, on a not-for-profit basis, the physical plant, equipment, and personnel for conducting research. Industrial concerns, groups of companies, individuals, or governmental agencies contract with the Institute for its research services. They are known as "sponsors". All results from the research become the exclusive property of the sponsor, and he is billed for the cost of the work, plus a proportionate share of the undistributed expense. In effect, then, Battelle is the "private" laboratory of each of its industrial sponsors.

Many small companies use the Institute for all of their research investigations and thus are spared the cost of building and staffing laboratories of their own. Larger companies use the Institute to supplement their own research departments, or for investigations involving skills and facilities beyond those of their own laboratories. The Institute also acts as a principal laboratory of various research and trade associations.

In keeping with its educational function, the Institute also conducts fundamental or basic research in many fields of science. The results are published for the general encouragement of science and industry, and to benefit the public welfare.

what it does . . .

Battelle conducts research in practically all fields of industrial science, in agriculture, and in many specialized technologies. The Institute's broad fields of endeavor include:

- Chemistry
- Metallurgy
- Industrial Physics
- Fuels and Combustion
- Ceramic Technology

- Mineral Processing
- Chemical Engineering
- Electrical Engineering
- Mechanical Engineering
- Petroleum Technology
- Electrochemistry
- Plastics, Rubber, and Paints
- Electronics
- Theoretical and Applied Mechanics
- Nucleonics
- Welding Technology
- Graphic Arts
- Engineering Economics
- Agricultural Sciences
- Operations Research

Any research or development problem within these fields can be handled by the Institute's staff. Battelle, however, does not accept routine chemical analysis or testing assignments nor jobs that belong properly to testing laboratories or consulting engineering firms.

A research investigation may involve the development of a new process, material, machine, or product. It may be aimed to answer a perplexing manufacturing problem or to improve the competitive position of the sponsoring company. Battelle, in cooperation

with representatives of the prospective sponsor, outlines a research program. The research is completely confidential, and all data and results are the property of the sponsor. If the work leads to patents, they are assigned to the sponsor.

In addition, the Institute makes technical and economic surveys to determine markets, availability of materials, trends, and the economic outlook for industrial products. It also evaluates patents and makes literature searches.

the people who do the work . . .

Battelle's staff is made up of 2100 research scientists, technicians, and service personnel. These people are selected on the basis of their technical competence, experience, and ability to work cooperatively with each other.

All the 48 states and 160 colleges and universities are represented on the Battelle staff. Members of the staff have had industrial experience with hundreds of companies scattered throughout the country. Through deliberate selection of personnel, an effective balance between theoretical science and its application in industry is maintained.

Battelle staff members have professional ex-

perience in most fields of technical endeavor. Knowledge and skills as diversified as lubricant chemistry, plant physiology, photoengraving, locomotive design, nuclear physics, aeronautics, meteorology, oil-well drilling, floriculture, and coal mining are included.

The professionally trained research staff, which comprises about two-thirds of the whole, is assisted by a body of equally highly qualified service personnel. These include laboratory technicians, librarians, attorneys, accountants, machinists, clerks, and maintenance personnel.

More than 200 members of the Battelle staff are listed in "American Men of Science". Since 1945, Battelle men have served as national president of four major professional societies. Members of the staff are affiliated with and take an active part in numerous other professional societies, as well. Many of the major awards and honors of national technical societies have been bestowed upon Battelle men.

Since Battelle's founding in 1929, its staff members have published over 1800 technical books and papers. These same people have been granted more than 500 domestic and foreign patents.

Battelle's staff is headed by Dr. Clyde Williams, director. He is aided by eleven assistant directors—all men of recognized scientific and executive competence.

plant & equipment . . .

Battelle's physical plant includes seven modern laboratory buildings situated within a fifteen-minute drive from downtown Columbus; a suburban greenhouse, agricultural laboratory, and several outlying laboratories and warehouses. The Institute also maintains a permanent station in North Florida for research on the deterioration of materials and, for its agricultural work, has cooperative arrangements with farmers in various states. The Columbus plant, together with equipment, has an estimated replacement value of 15,000,000 dollars. The seven central buildings occupy portions of four city blocks and have over fifteen acres of laboratory area.

Research groups and working divisions are housed as units and are distributed in such a manner as to make for the most convenient use of the laboratories. In addition to the research groups, the Institute has various central services. These include laboratories for photography, analytical chemistry, metallography, radiochemistry, mechanical testing, and instrumentation; a patent department; and machine and woodworking shops.

Research equipment, valued at 4,000,000 dollars, includes the most advanced tools of modern science. Standard testing machines, apparatus, furnaces, and instruments furnished for research are supplemented by

special tools and machines, many of them unique, built to requirement in the Institute's shops.

The Institute's technical library has more than 30,000 bound volumes and 100,000 patents. It receives more than 950 technical magazines and scientific journals each month.

how a project is set up . . .

The usual method for setting up a research project is to meet with representatives of the sponsor to define the problem. When this has been done, and it is determined that an effective and mutually agreeable program can be developed, both cost and time can be estimated with a fair degree of accuracy. These are made a part of the contract, so that the sponsor knows his commitments in advance.

The cost of the research depends upon the scope and duration of the project. Costs consist of the actual charges for services of research and supervisory personnel and their technical and nontechnical assistants, materials, use of equipment, and undistributed expenses.

A research project is accepted as the responsibility of Battelle as a whole. It is assigned to the group or groups best qualified

to handle it. By cooperative attack, lost motion and wasted efforts are eliminated and high efficiency is obtained.

Arrangements are made in advance for the type of research reports that will be mutually advantageous. These may be in the form of monthly letter reports, topical reports, quarterly reports, or otherwise as the sponsor may wish.

For additional information write to:

Battelle Memorial Institute
505 King Avenue
Columbus 1, Ohio

Attention: The Director

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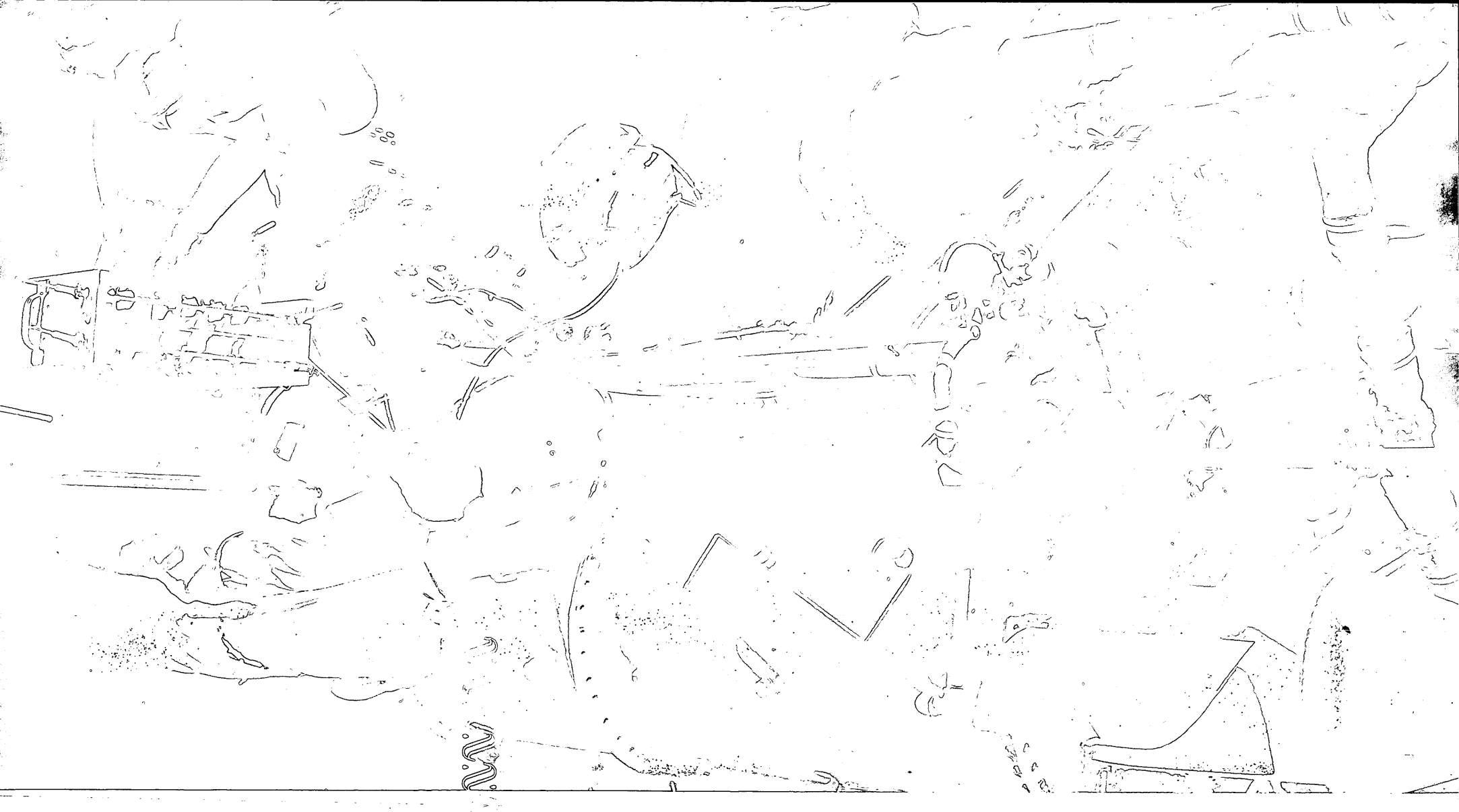
"Industrial research has come to be recognized as the activating force behind our nation's progress. Income appropriated to it is not spent—it is invested."—Clyde Williams.

May, 1953

BATTELLE MEMORIAL INSTITUTE

505 King Avenue

Columbus 1, Ohio



AN INVITATION . . .

BATTELLE

YOUR TIME, we believe, will be well spent. You'll see Research in Action —our 1600 staff members working in teams—developing new products or materials—exploring new processes—solving technological problems—adding to the comfort, security, and well-being of mankind.

You'll be guided over twelve acres of laboratories used by 38 research divisions—and you'll be encouraged to ask about the men, the ideas, and the machines that are essential to research.

You'll be told how Battelle, a nonprofit corporation, founded by the will of Gordon Battelle as a memorial to a pioneering Ohio industrial family, brings into the reach of all industry the advantages of modern scientific research.

You'll be free to discuss your own problems with outstanding scientists and engineers, including our research supervisors, assistant directors and technical advisors, who cooperate to see that each research project has the best scientific counsel and advice possible. You'll be invited to talk to men who can discuss trends in fields of science —who appreciate the economics of the free enterprise system—and who know that research must pay off in dividends.

You'll meet chemists, physicists, engineers, mathematicians, biologists, metallurgists, ceramists, and trained experts in almost every field of physical science—all available for use by American industry.

You may encounter many of the 18,000 visitors we have each year—business executives, bankers, investment counselors, attorneys, research directors, scientists, engineers, or officers from the Armed Forces. These men, like you, may be seeking information on their problems, or may be merely visiting to see what we have.

You may find friends of yours here—men from mining companies, petroleum companies, the natural gas concerns, coal companies—all the extractive industries. You'll also find representatives from the automotive industry; the companies that manufacture and fabricate iron, steel, aluminum, zinc, copper, titanium, zirconium, and other metals; the glass companies; tile producers; electrical and radio concerns; food producers and processors; printing and printing equipment companies—in fact, a whole cross section of American industry.

Whether you have a problem of your own—or just a general interest in scientific progress—you'll find a day at Battelle a stimulating experience.

YOU'LL

MEET

MEMBERS

OF

OUR

STAFF

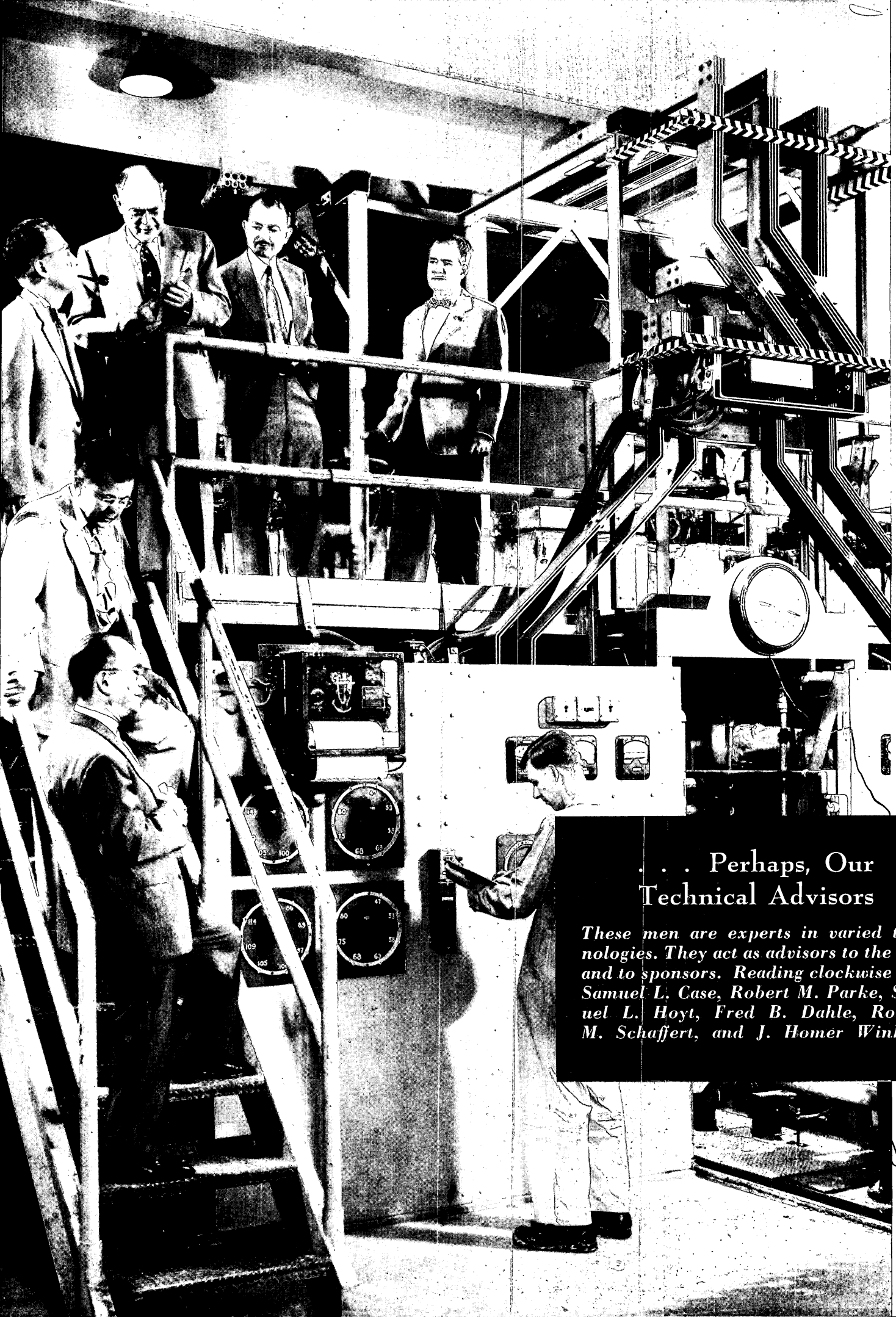
The physical and biological sciences and virtually all technologies are represented by the 1600 persons who make up the Battelle staff. Many are internationally recognized experts.

THOSE WHO SUPERVISE BATTELLE RESEARCH

These men are the supervisory heads of Battelle working units. They manage and coordinate the work of research, service, and administrative groups.

Starting at the extreme left and reading clockwise: Harold R. Nelson, Physics; Cameron G. Harman, Ceramics; Russell S. Drum, Personnel; Edward E. Slowter, Contracts, Finance; H. Zane Schofield, Ceramics; John W. Clegg, Chemical Engineering; John F. Foster, Fuels and Combustion; Randall G. Heiligmann, Plastics; Ellsworth E. McSweeney, Industrial Chemistry; Bertrand A. Landry, Fuels and Combustion; Constantine B. Voldrich, Welding; Francis W. Boulger, Metallurgy; Robert R. Adams, Research Services; H. Maurice Banta, Metallurgy; Charles F. Lucks, Physics; Harlan W. Nelson, Fuels

and Combustion; Horace J. Grover, Physics; Robert I. Jaffee, Metallurgy; William A. Welcker, Buildings and Purchasing; Richard B. Engdahl, Fuels and Combustion; Robert M. Conklin, Mechanical Engineering; William T. Reid, Graphic Arts; Ivor Campbell, Metallurgy; Arthur E. Middleton, Dielectrics and Semiconductors; Arthur E. Bearse, Organic Chemistry; K. Starr Chester, Agricultural and Biological Sciences; Richard J. Lund, Engineering Economics; Ernest R. Mueller, Organic Coatings; A. C. Richardson, Mineral Processing; Robert C. McMaster, Electrical Engineering; Charles T. Greenidge, Foundry Metallurgy; William H. Browne, Petroleum Engineering; Russell W. Dayton, Engineering Physics; H. A. Pray, Corrosion, Inorganic and Physical Chemistry; Robert O. Stith, Public Relations; Howard C. Cross, Metallurgy; David T. Williams, Physics; George K. Manning, Metallurgical Engineering; E. John Center, Analytical Chemistry; Iver Igelsrud, Technical Information; Paul R. Langdon, Accounting; Charles L. Faust, Electrochemistry; and J. Harry Jackson, Physical Metallurgy.



. . . Perhaps, Our Technical Advisors

These men are experts in varied technologies. They act as advisors to the staff and to sponsors. Reading clockwise are: Samuel L. Case, Robert M. Parke, Samuel L. Hoyt, Fred B. Dahle, Roland M. Schaffert, and J. Homer Winkler.

. . . Or Director Williams And The Members Of His Executive Committee

Pictured here are the Director and Assistant Directors—the top executives of Battelle. Reading clockwise, starting at the extreme left: Lloyd R. Jackson, Clarence E. Sims, Howard W. Russell, John S. Crout, Director Clyde Williams, David C. Minton, Jr., Bruce W. Gonser, Clarence H. Lorig, Frank C. Croxton, John D. Sullivan, Ralph A. Sherman, and Bertram D. Thomas.

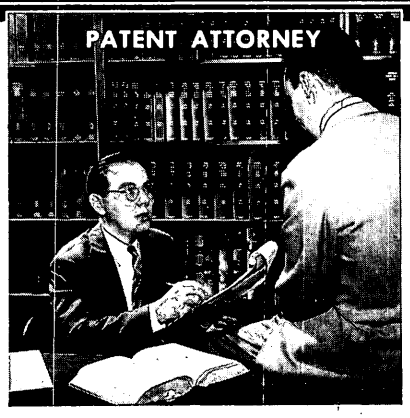
GLASS BLOWER

TESTING TECHNICIAN

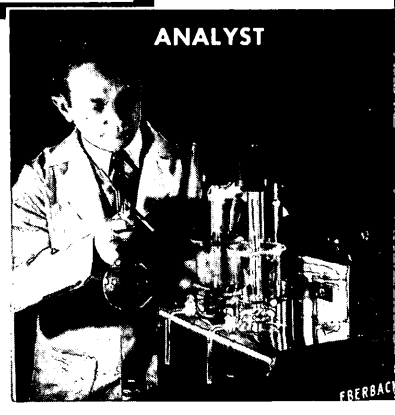
DRAFTSMAN

RESEARCH SUPERVISOR, CHEMIST, PHYSICIST, ENGINEER

TRANSLATOR



PATENT ATTORNEY



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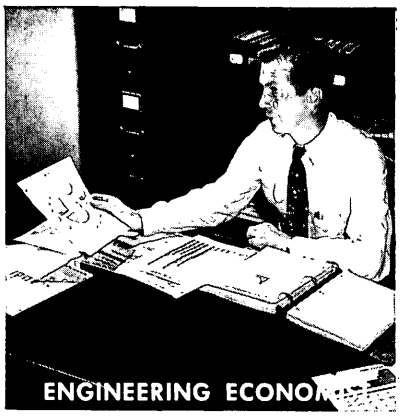
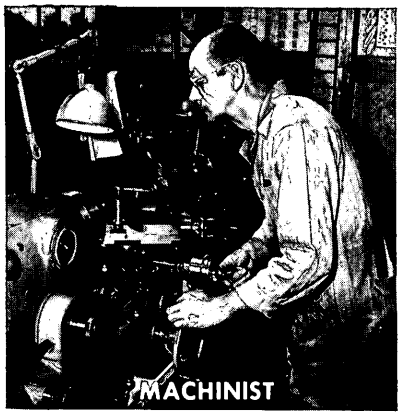
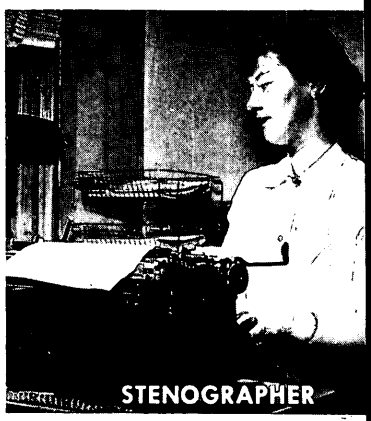
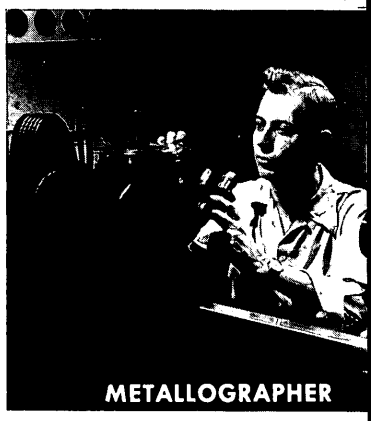


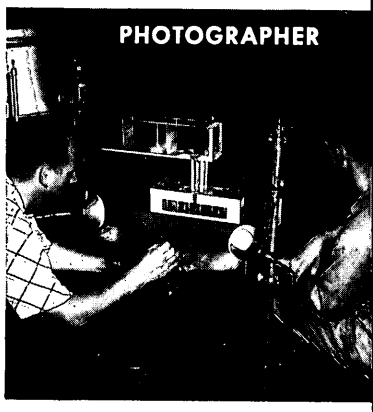


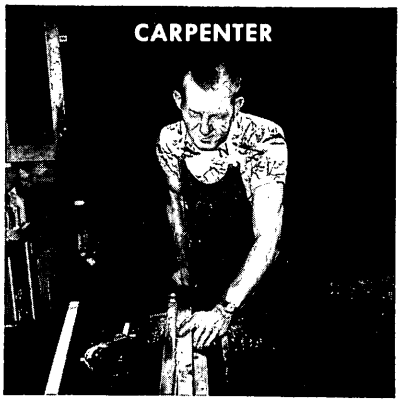


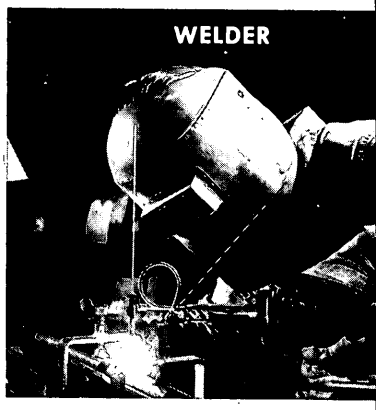


YOU'LL SEE RESEARCH IN ACTION . . . HOW TEAMWORK GETS RESULTS

The cooperative approach to the solution of research problems is the dominating principle in Battelle's research philosophy. By the use of research teams, all the applicable skills and knowledge of the staff can be brought to bear on the problem. A research team includes a basic unit of engineers and scientists, supplemented by the technicians and other assistants required for the most efficient conduct of the particular project.







BATTELLE PEOPLE

Their Technical Knowledge and Skills Are The Institute's Primary Resource . . .

Battelle has a staff of 1600 people drawn from all the 48 states and from 160 colleges and universities. The knowledge and skills they possess are the Institute's primary resource and the reason for Battelle's position in science and technology.

About two-thirds of the staff are professionally trained research workers and technicians. The remainder are librarians, photographers, editors, stenographers and typists, machinists, accountants, clerks, maintenance employees, and auxiliary personnel.

The research staff includes many professional specialties. There are chemists, metallurgists, ceramists, physicists, mathematicians, and engineers in all fields of industrial specialization. There are also economists, geologists, agronomists, patent attorneys, and statisticians.

Many Battelle research men have held responsible positions in industry before coming to Battelle. Thirty of the present staff were research directors, chief engineers, or the equivalent. Battelle people are chosen and trained to make practical the Institute's function as a bridge between science and industry.

Battelle staff members take an active part in the 105 professional societies of which they are members. In recent years, Battelle men have been the presidents of four of the country's major technical societies. Other Institute staff members have been directors, national vice presidents, and trustees of their respective organizations.

In Battelle's first 21 years, its staff members published 1400 articles, papers, and books, reporting the results of their research to the technical world. In the same period, 400 domestic and foreign patents were issued to Battelle staff members and assigned to sponsors.

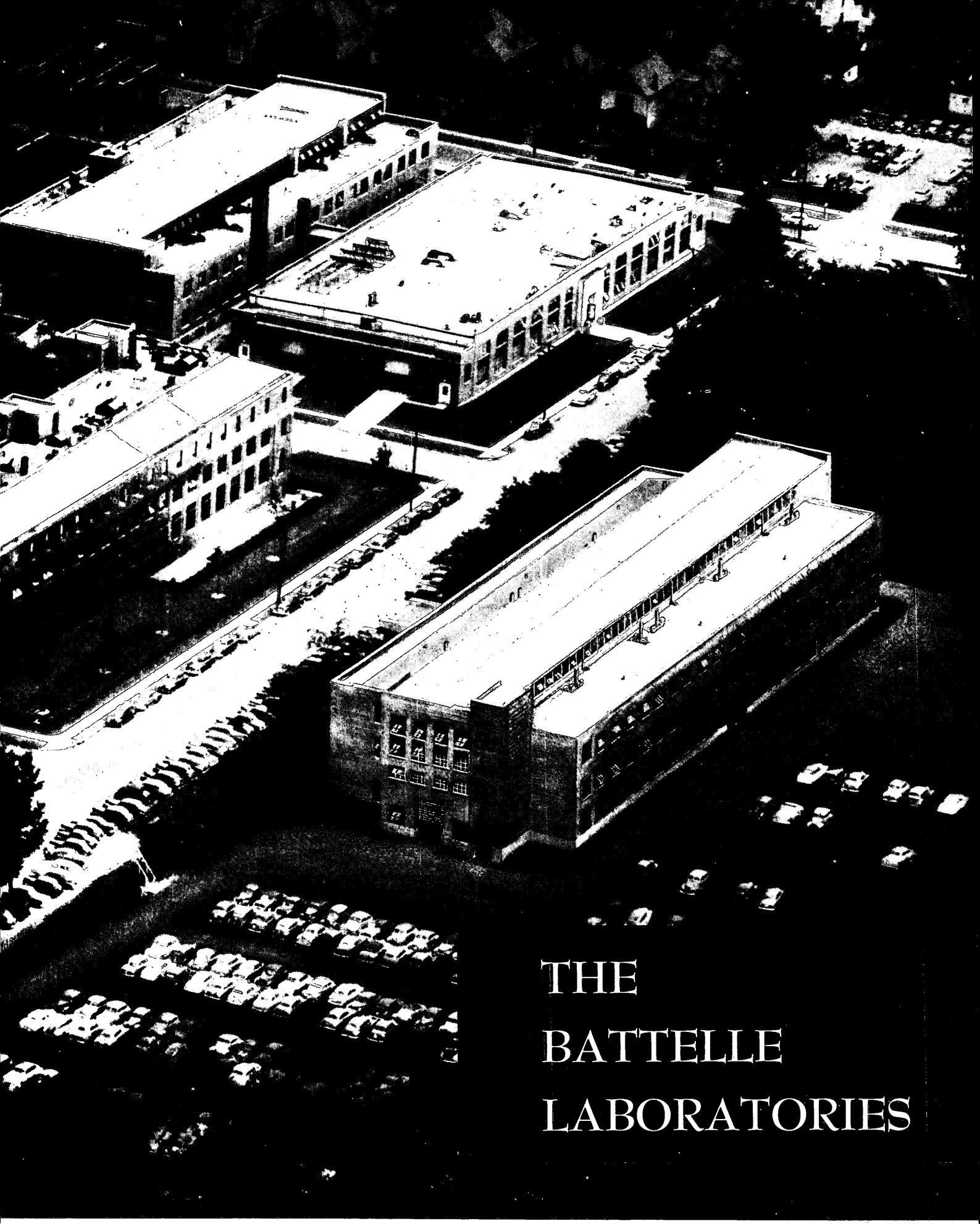
The complete list of awards and honorary positions won by men now doing Battelle research would take much space. Two Battelle chemists, working in plastics and fuels chemistry, have been designated among the "ten ablest chemists" in their fields by the Chicago Section of the American Chemical Society. Some of the major annual awards received by Battelle men include: Howe Medal, Albert Sauveur Achievement Award, and Campbell Memorial Lecture, ASM; Institute of Metals Lecture, Annual Lecture, and Robert W. Hunt Award, AIME; John A. Penton Gold Medal and Joseph S. Seaman Gold Medal, AFS; Percy Nicholl Award, ASME and AIME; Adams Lecture, AWS; Fellow, British Institute of Fuels; Mehl Honor Lecture, Society for Nondestructive Testing; and Institute Medal, American Iron and Steel Institute. Two hundred Battelle staff members are listed in "American Men of Science".

Battelle Institute itself received the 1945 award for Chemical Engineering Achievement for significant contributions to the research and engineering responsible for the development of the atomic bomb. Thirty staff members earned individual certificates for the same work.

LITERATURE CONTRIBUTIONS-A PUBLIC SERVICE

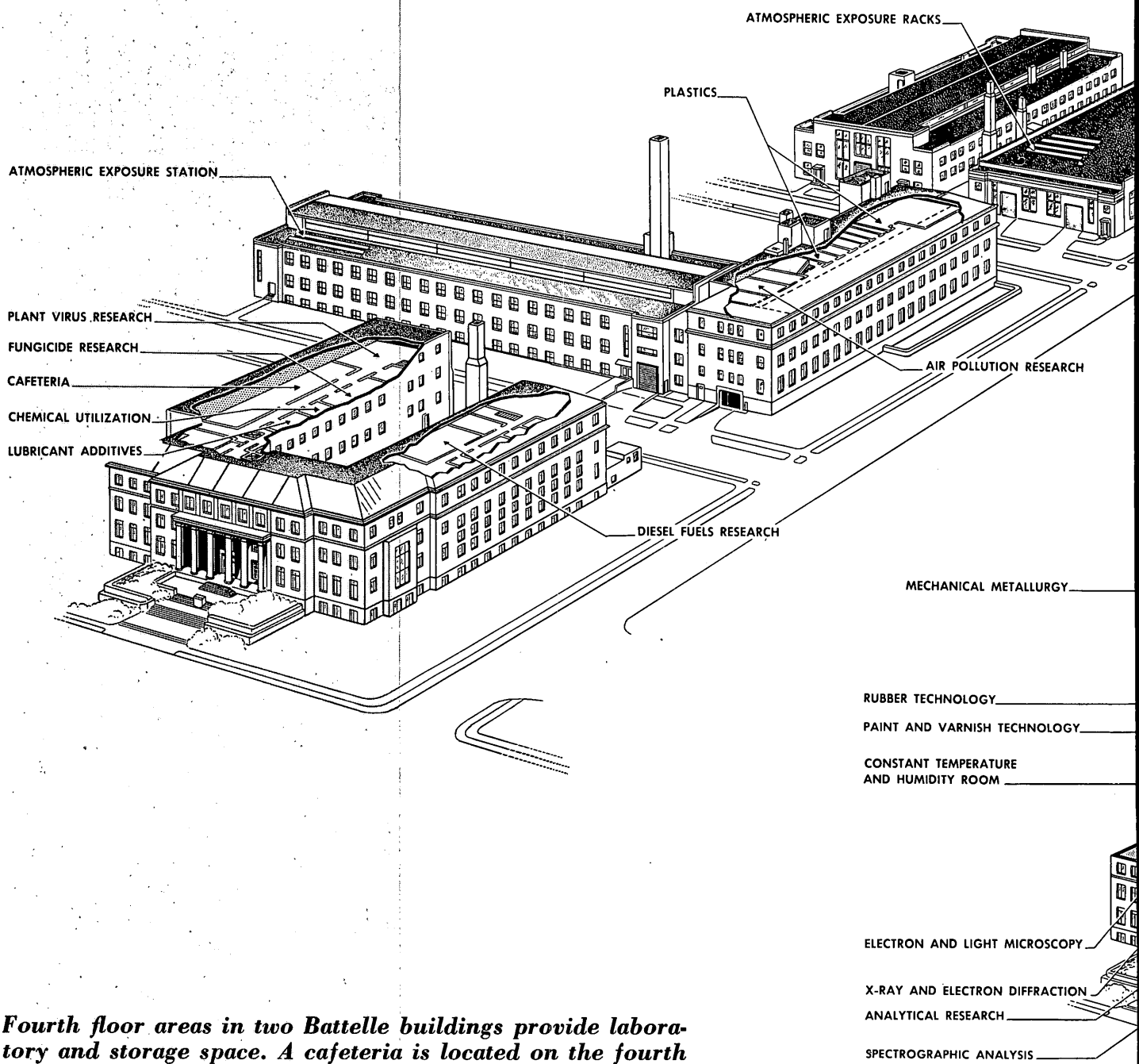
It was the wish of Gordon Battelle, Institute founder, that knowledge of new and improved technologies be widely disseminated. Battelle staff members contribute regularly to scientific, trade, and business publications. Books by Battelle men become standard references.

YOU WILL WANT TO TOUR



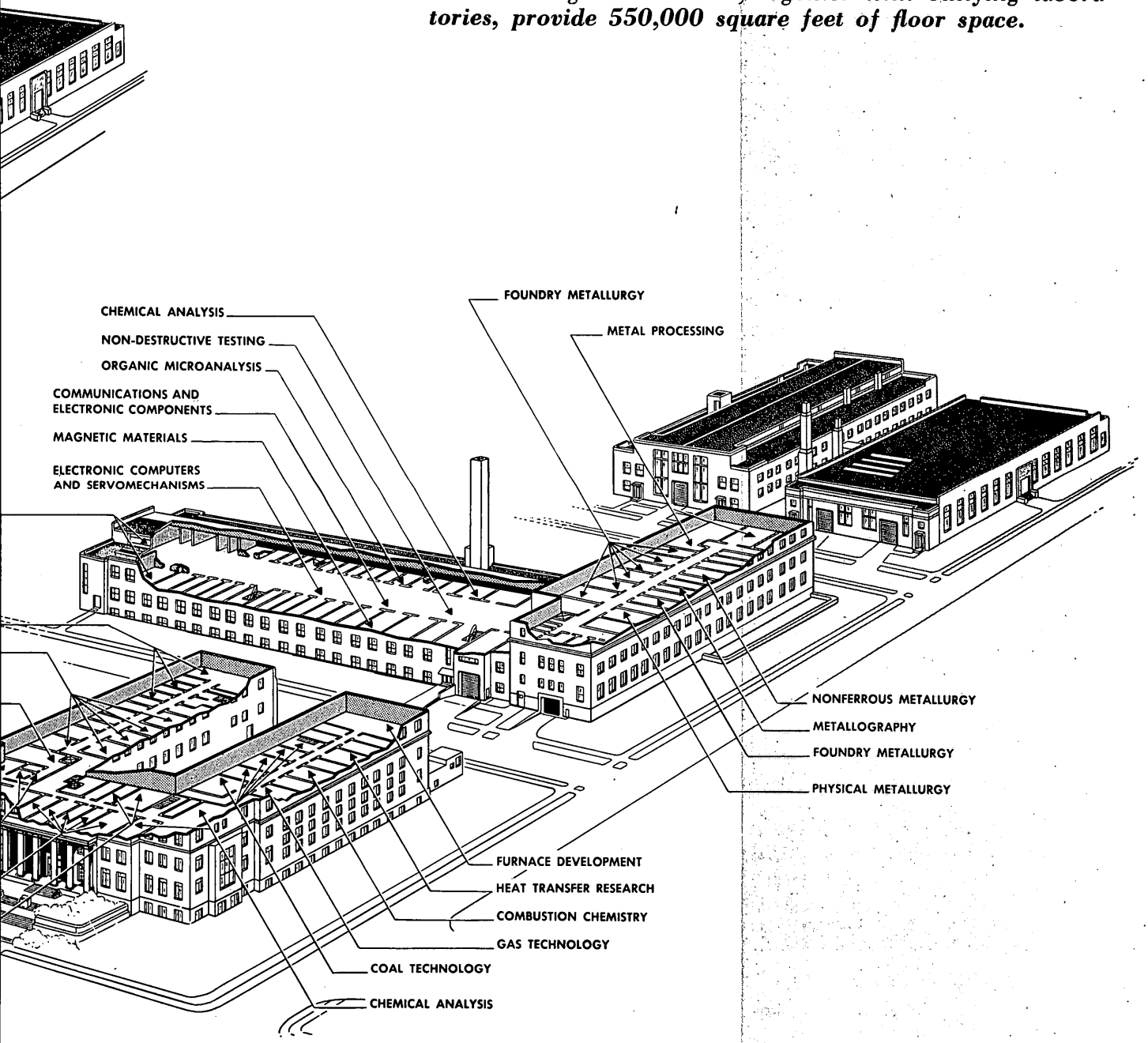
THE BATTELLE LABORATORIES

These Are The Laboratories On The FOURTH FLOOR LEVEL



Fourth floor areas in two Battelle buildings provide laboratory and storage space. A cafeteria is located on the fourth floor of the front building. The building, shown by artist's rendering at the extreme right on the preceding page, was scheduled for occupancy in mid-1952.

Laboratories for research in fuels technology, metallurgy, electrical engineering, rubber and coatings chemistry, and analytical procedures are concentrated on the third floor. The buildings shown here, together with outlying laboratories, provide 550,000 square feet of floor space.



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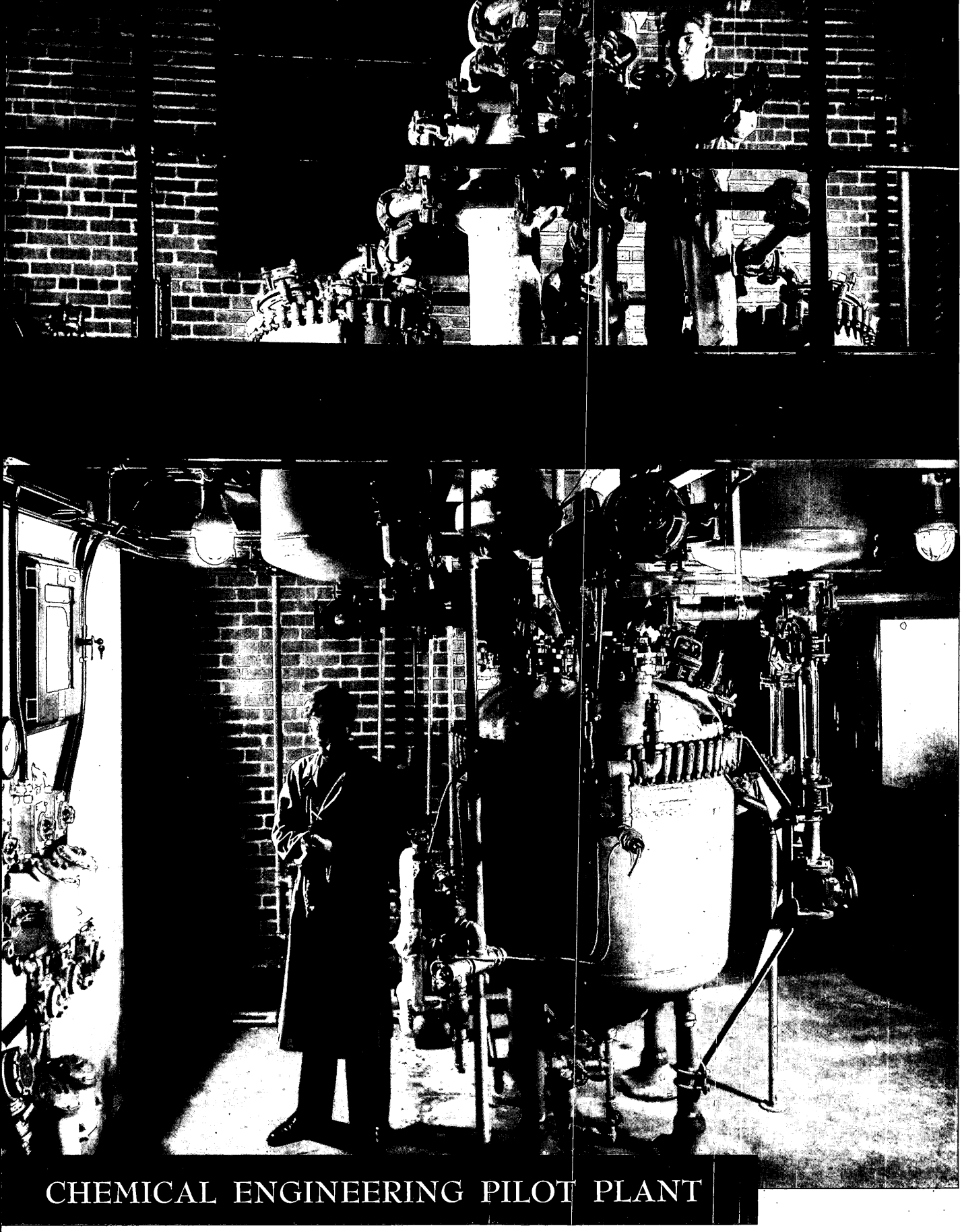


CHEMICAL ENGINEERING PILOT PLANT

A two-story-high pilot plant in Battelle's chemical engineering laboratory. A versatile unit, it is used for evaluating the commercial possibilities of processes for manufacturing organic chemicals.

RESEARCH FOR INDUSTRY

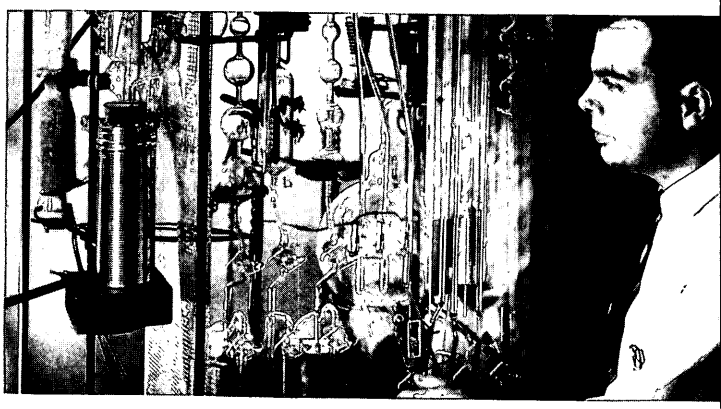
In your tour of Battelle, you will be impressed by the size of the physical plant. You will see hundreds of small laboratories and large, high-ceiling areas for pilot-plant operations. You will find service laboratories and offices scattered among research units, and dissimilar operations adjacent to each other. You may wonder at the lack of sharp lines of demarcation between apparently unrelated fields of technology—the absence of departmentalization.

The lack of boundaries and apparent organization in the Battelle physical layout is in itself a high order of organization. It results directly from the Battelle philosophy of research. In the Battelle plan, the services of the entire Institute—not of one man or one department—are available to solve the research problem. Thus, since the Institute operates as a cooperative unit, there is no need for segregating laboratories according to fields of technology. Instead, various research activities are located so as to make best functional use of space.

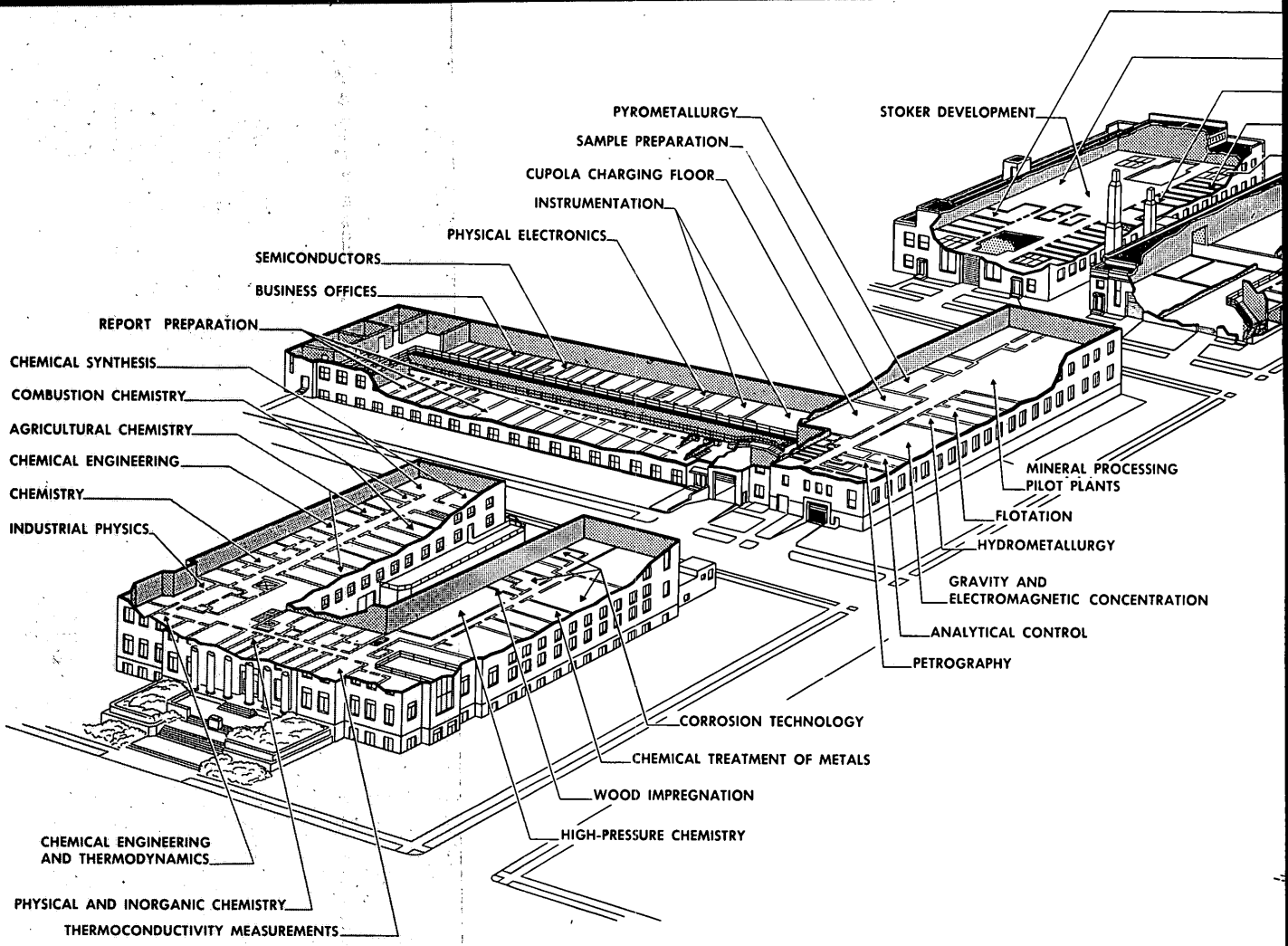
When a research project is undertaken, major responsibility for its execution is assigned to one or more research groups. These, as the occasion demands, call upon specialists in other groups to handle pertinent phases of the problem. Thus, at any one time, work on various phases of the problem may be in progress at many different places throughout the Institute.

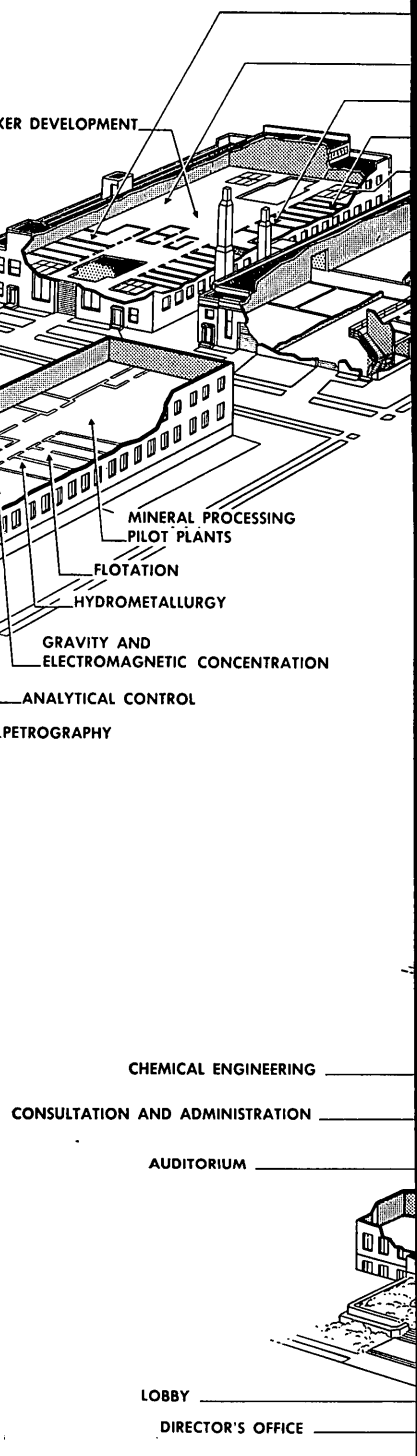
The cooperative method of attack means that the sponsor gets the advantages that go with Battelle's comprehensive organization. On his one research project, the skills and know-how of several nationally recognized experts may be applied. Twenty or more highly specialized technicians may handle the manual operations for his job. Equipment and machinery having a capital value of many thousands of dollars may be utilized. All the efforts are closely coordinated by Battelle's supervisory staff. In effect, Battelle is the "private" laboratory of each of its sponsors. The individual sponsor receives the same benefits he might receive if he owned a multi-million-dollar laboratory of his own.

Thus, through the Battelle plan, the advantages of complex, modern-day research are brought within the range of all industry. Small companies are given the same competitive advantages enjoyed by large companies with expansive laboratories of their own. Large companies are permitted to expand their research without additional capital investment. All have found the Battelle viewpoint and Institute-wide approach valuable.



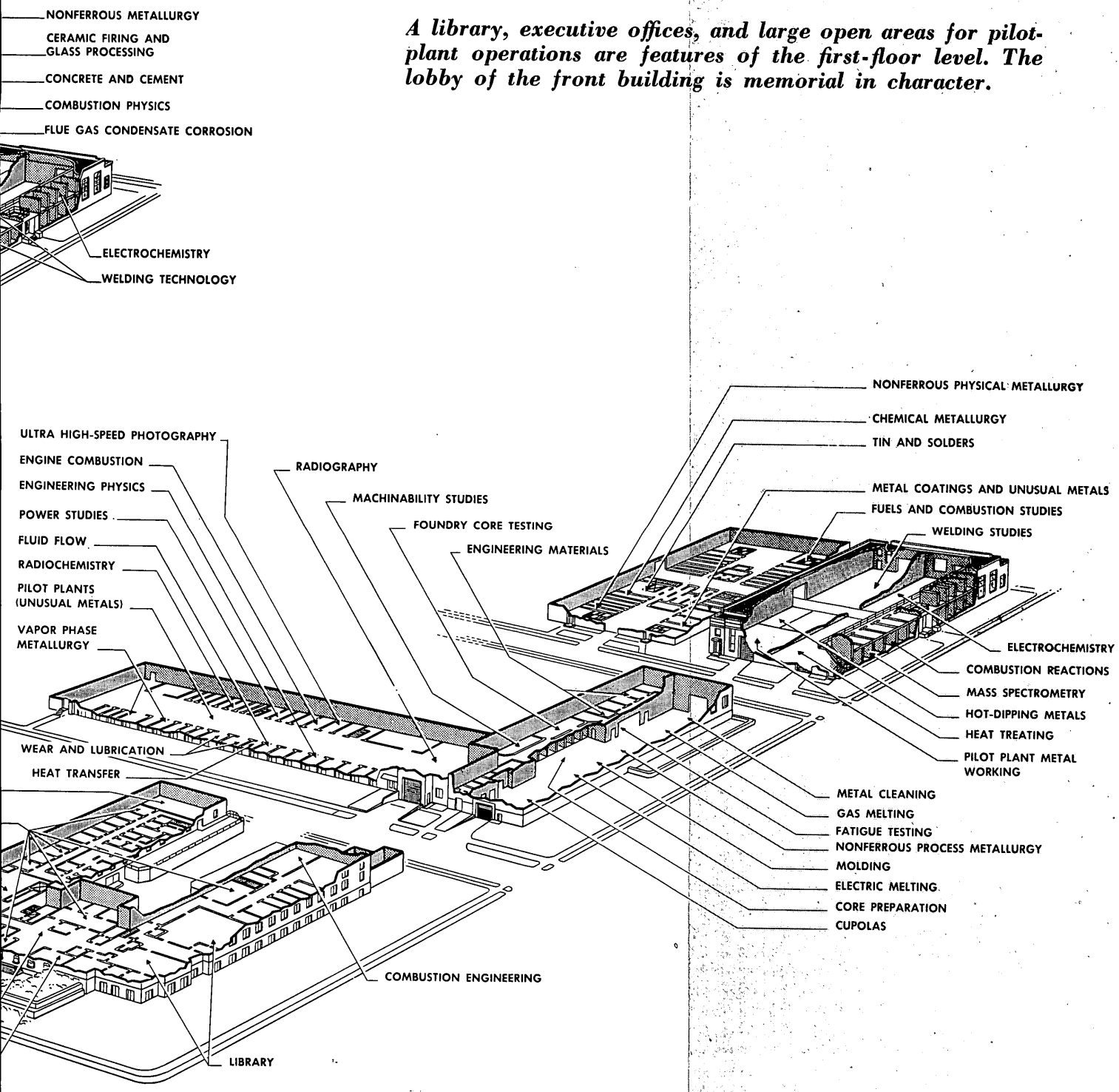
This Is The Layout Of The SECOND FLOOR LEVEL





Major laboratories for research in chemistry, physics, mineral processing, and electronics are located on the second floor. A stoker development laboratory, a ceramic firing area, and a report-preparation section are other features.

A library, executive offices, and large open areas for pilot-plant operations are features of the first-floor level. The lobby of the front building is memorial in character.



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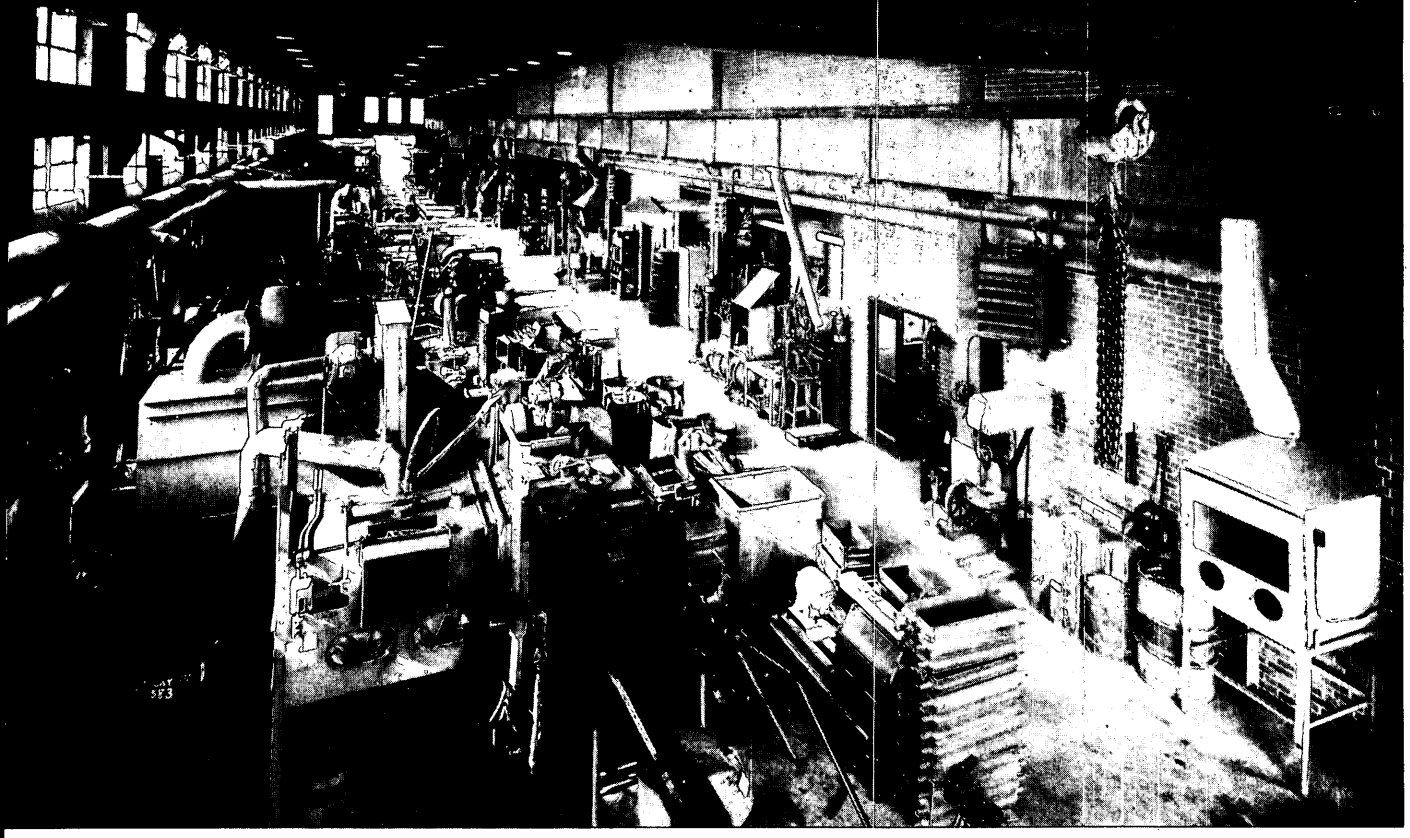
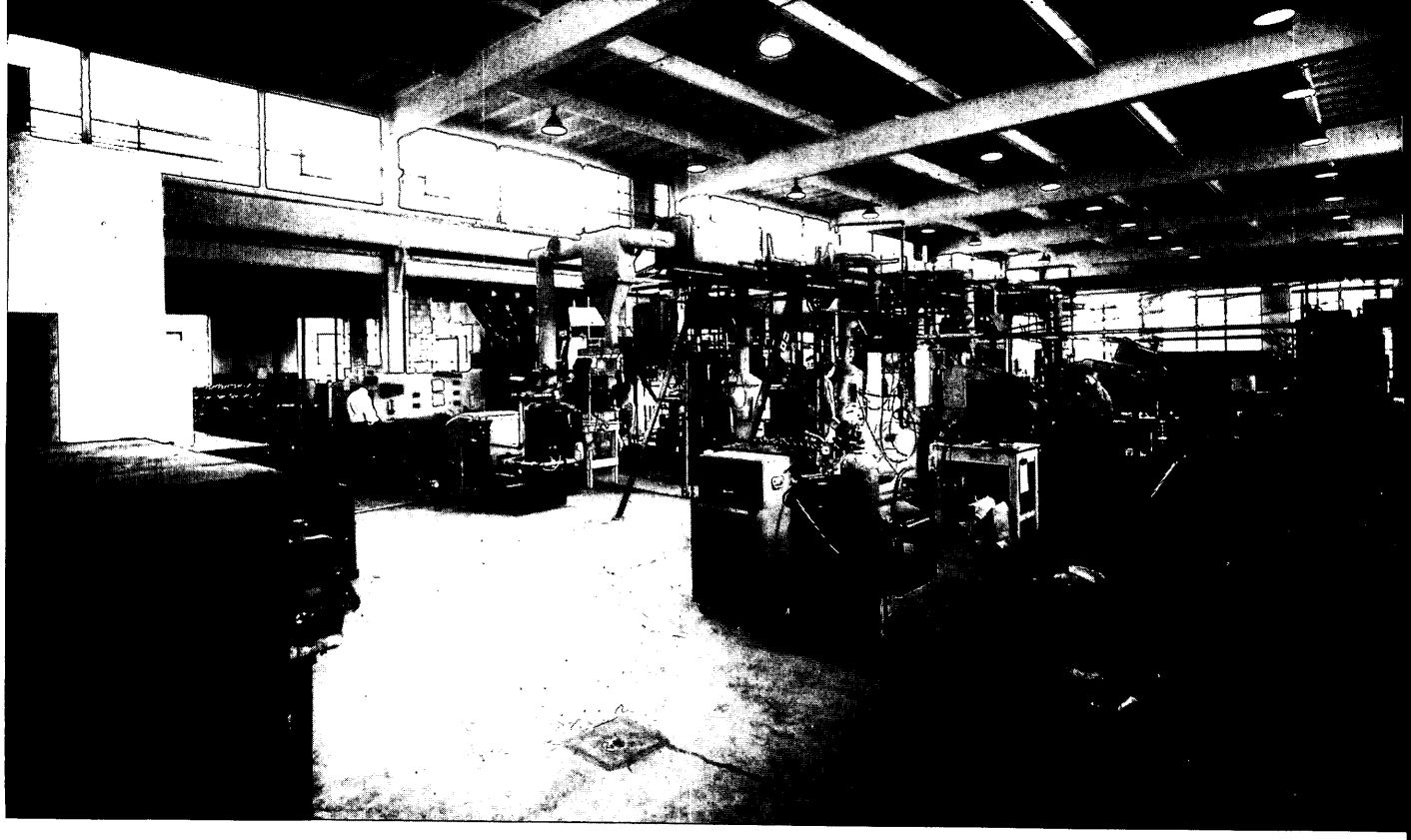


Complete facilities for melting, casting, and cleaning ferrous and nonferrous metals are available in Battelle's experimental foundry.

LABORATORIES SIMULATE

This area houses heat-treating furnaces, electrochemical pilot plants, and facilities for research on waste disposal problems.

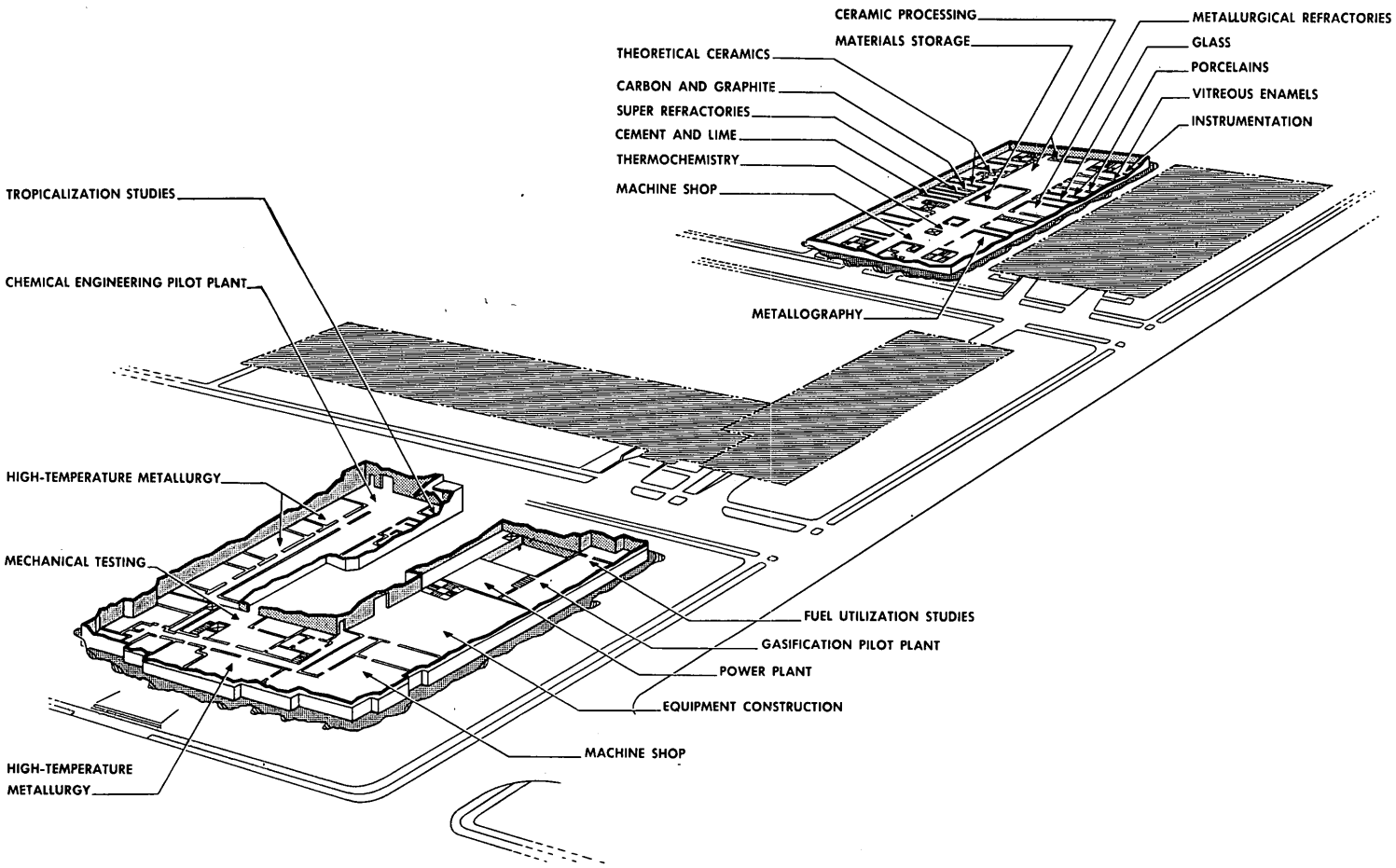


A section of a laboratory used for the development and evaluation of coal stokers and other equipment used for residential heating.

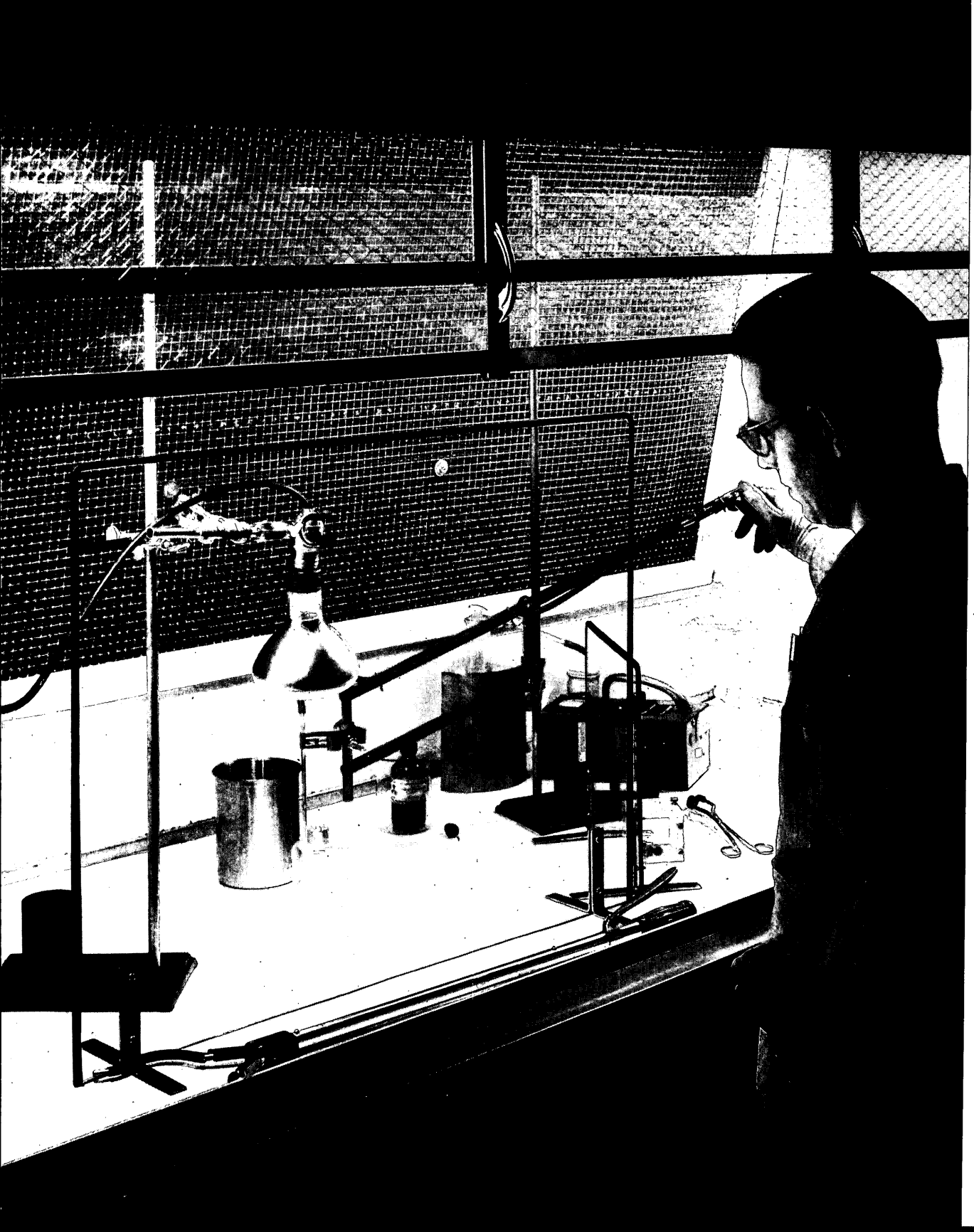
INDUSTRIAL CONDITIONS

Problems in welding and in the development of welding processes are studied in this large laboratory on the ground-floor level.

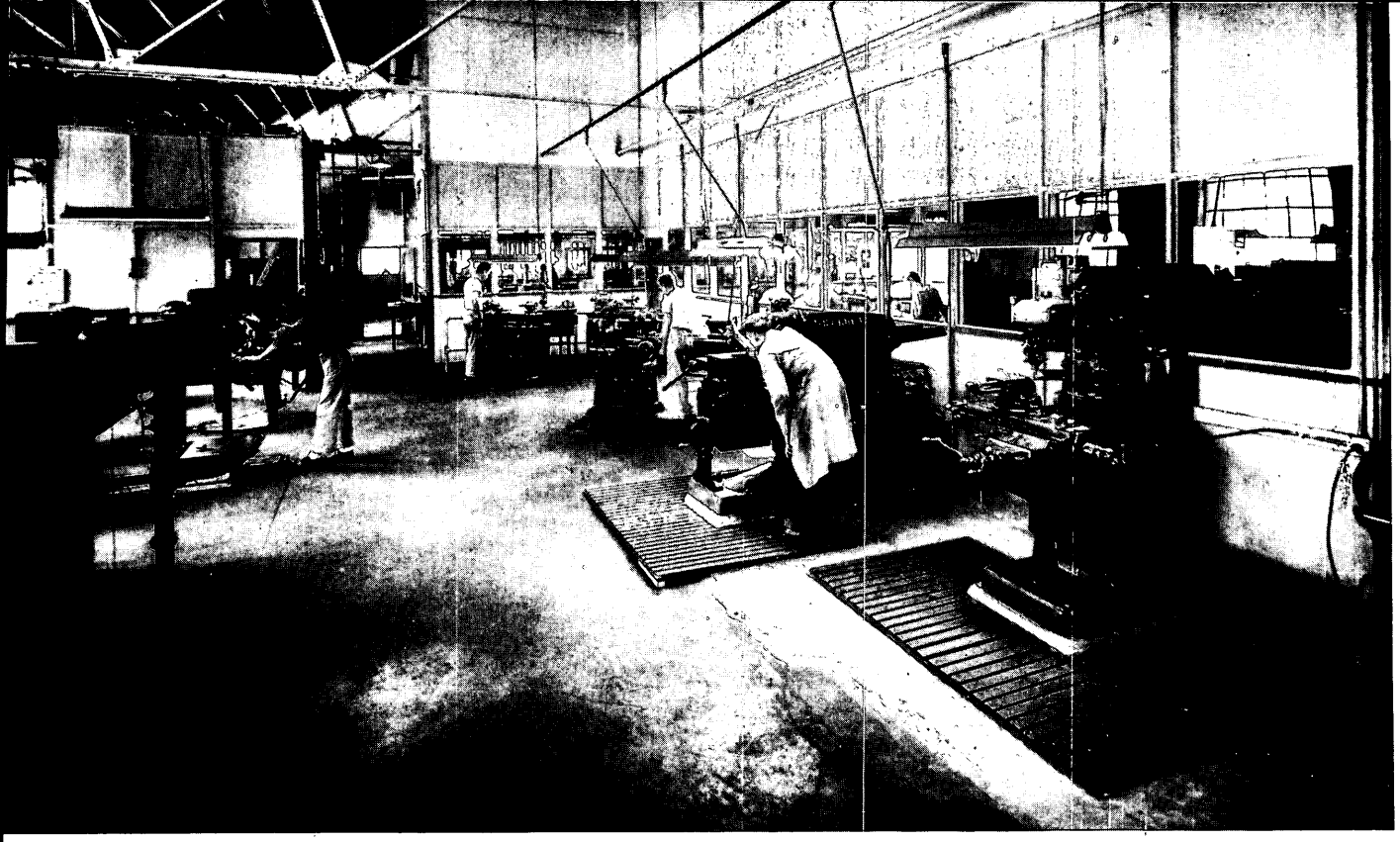
Laboratories on the GROUND LEVEL . . .



Two large machine shops, a metal- and wood-working area, storeroom, ceramic laboratory, and physical testing laboratories are located on the basement level. Buildings are linked by tunnels or first-floor passages.

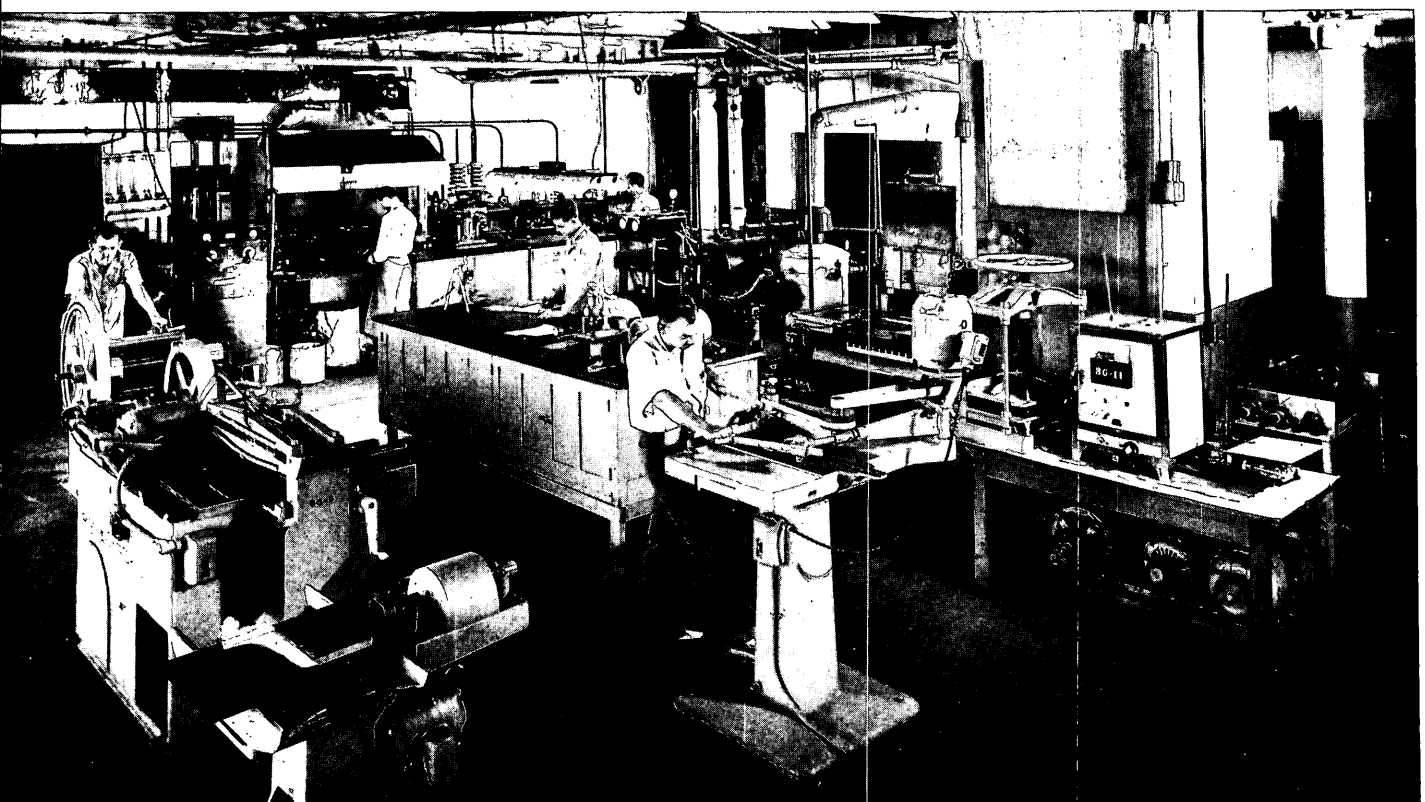


Atoms "tagged" with radioactivity are useful in the synthesis of chemical compounds, the study of chemical mechanisms, and in many other fields of research. Radioactive materials also offer new methods for making physical measurements. Here in Battelle's radiochemical laboratory, a scientist uses remote-handling equipment to transfer radioactive solution.



Prototypes of new and improved products developed in Battelle's production engineering research are made in this large laboratory.

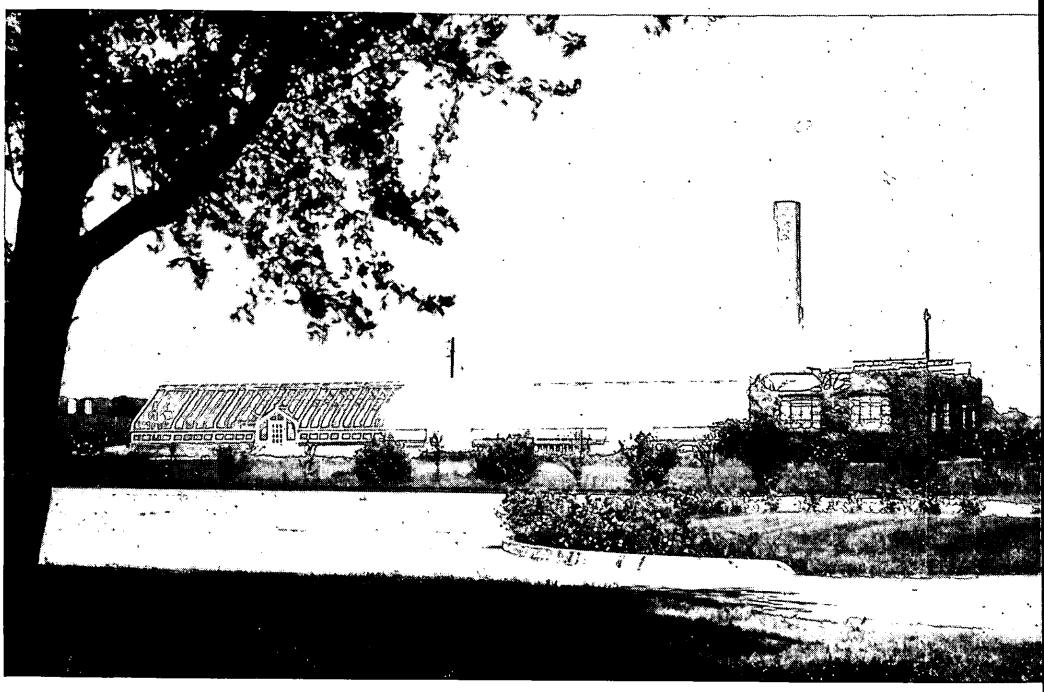
A section of a laboratory used for research in the graphic arts. Battelle is headquarters for several national research organizations in printing, photo-engraving, book-binding, and related fields.



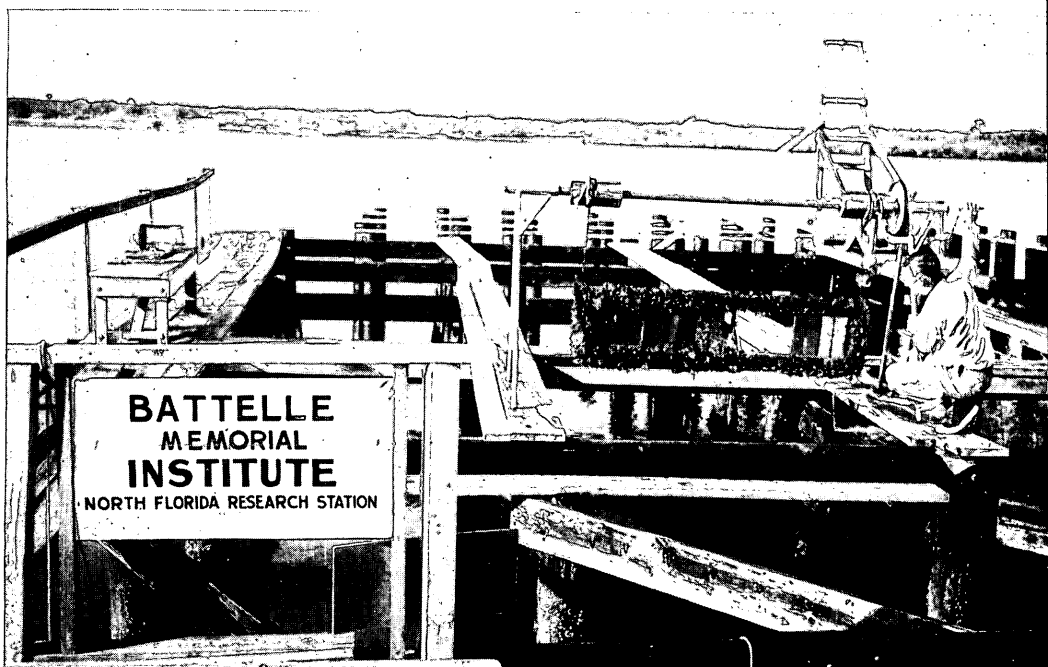
OUTLYING LABORATORIES

In addition to the principal laboratory buildings, Battelle has a number of auxiliary facilities. An agricultural sciences building, which includes a greenhouse and biological and biochemical facilities, is situated on acreage just outside the city limits of Columbus. The Institute also has a marine research station at Ponce de Leon Inlet (near Daytona), Florida. This laboratory is used principally for the evaluation of the resistance of materials to atmospheric, marine, and biological deterioration.

Laboratories and offices are maintained in two large leased structures a few minutes' drive from the main buildings in Columbus, and a warehouse is available for storage of equipment and materials. For agricultural field demonstrations, arrangements are made with cooperating farmers located in various states. As the need arises, the Institute establishes temporary research stations both in this country and abroad.

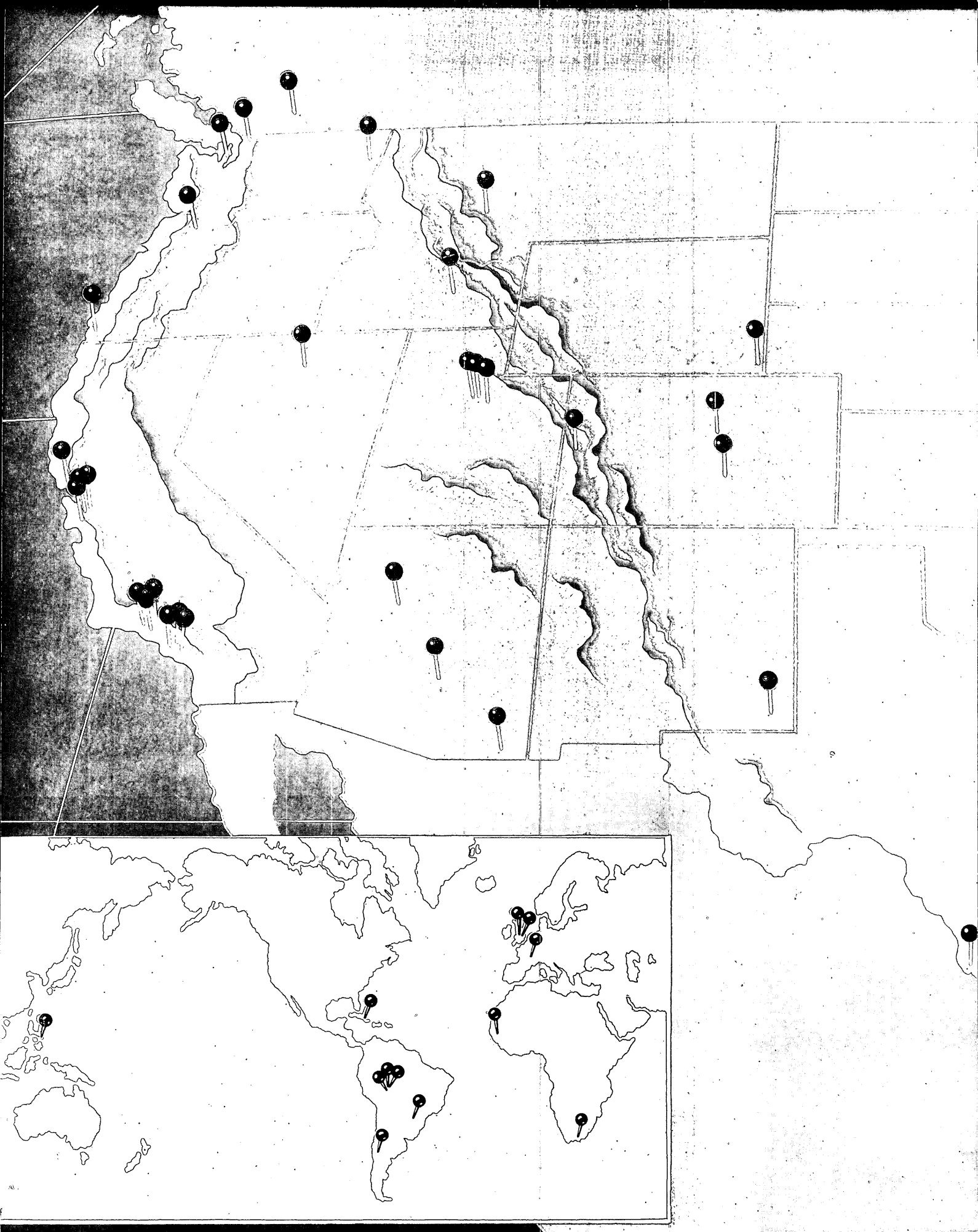


This laboratory, with connected greenhouse, is the focal point of much of Battelle's agricultural research.



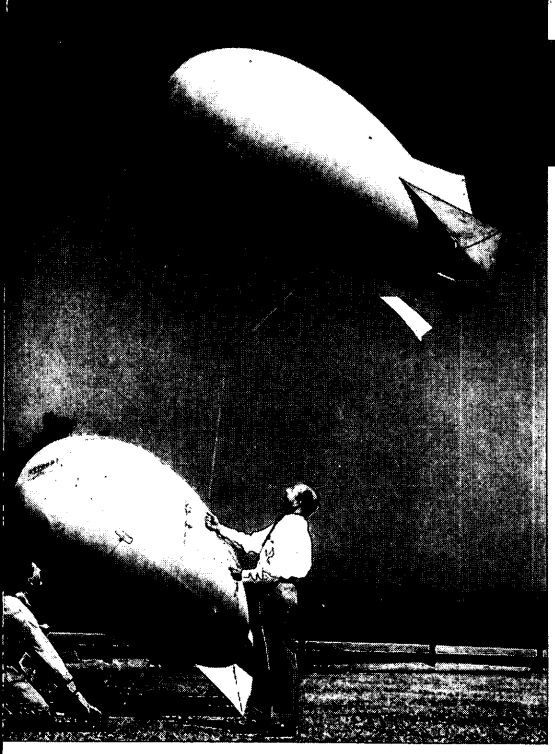
A research station in north Florida provides ideal conditions for studying the deterioration of materials.

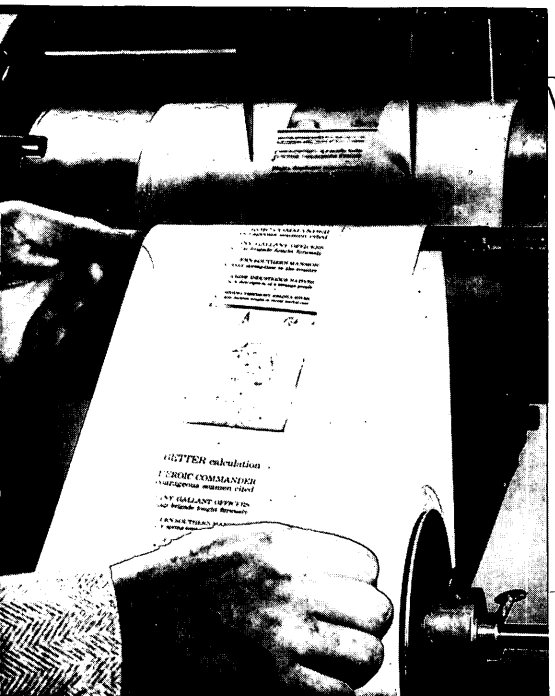
YOU'LL FIND THAT BATTELLE HAS



SERVED INDUSTRIES EVERYWHERE

Since 1929, Battelle has served more than 800 sponsors, located in 307 American cities and towns, 46 states, and 10 foreign countries.





CONTRIBUTING TO

Research, as conducted at Battelle, is a down-to-earth business dealing with down-to-earth problems. Research programs are designed to give the sponsor the answer he needs at a price he can afford to pay. The following examples illustrate how Battelle research benefits industry:

Oil men drilling in Texas and New Mexico were running into expensive problems. Their drill strings, which are made of pipe sections joined together to form a drill shaft for drill bits, were breaking frequently. Since they were drilling to depths as great as two miles, when a string broke it meant the possible loss of as much as $100,000. A research program at Battelle established stress-corrosion, induced by the peculiar drilling conditions of the area, as the cause of the breakage. Methods for remedying the trouble were suggested, and drill string breakage is now a rarity in the West Texas and New Mexico fields. The research cost approximately $20,000.

Aluminum welding is necessary to modern production, but, traditionally, it has been a headache. A large supplier of welding materials asked Battelle to help it develop a better method. Four years of research resulted in a patented process which uses a consumable-electrode system of welding in an atmosphere of inert gases (argon or helium). The process increases aluminum welding speeds from five to ten times. Adaptations of it are being applied to welding stainless steel, aluminum bronze, magnesium alloys, and all grades of regular steel with savings in manpower and materials.

One of the major oil companies wanted a new way to produce a widely used plastic. Battelle found a successful way to make the material, using only one-third to one-sixth as much

Top — Kytoons (kite-balloons) are used to carry instruments aloft to study air-pollution problems. Center — An experimental concentrator being tested in Battelle's mineral-processing laboratories in connection with a study of the concentration of an iron ore. Bottom — This experimental printing machine utilizes the principles of xerography to reproduce type and illustrations at extremely high speeds.

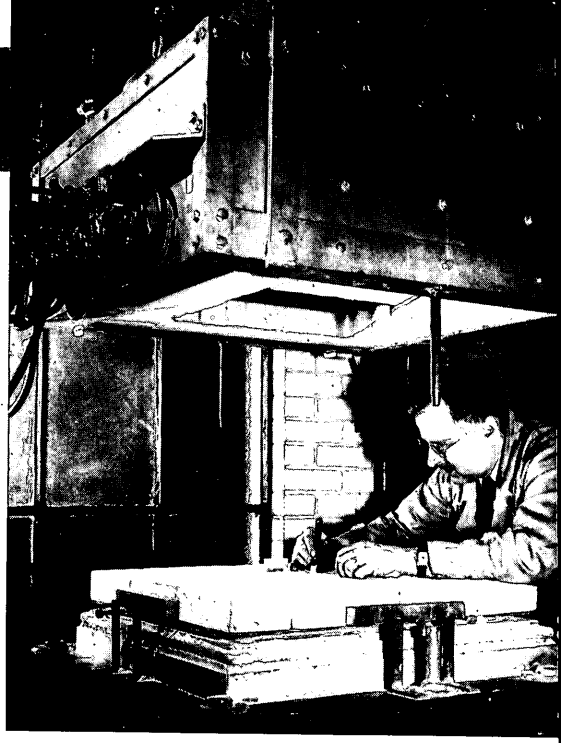
pressure as demanded by older techniques. This resulted in lower production costs and increased production.

A Battelle sponsor in the business of making automotive valve springs was suffering from a rejection rate as high as 20 per cent of production, because his product failed to pass a torsion test demanded by customers. Battelle research showed the desirability of making changes in handling and tempering operations. After the Battelle-planned changes were put into effect, the rejection rate dropped to substantially zero.

A handsaw manufacturer was forced to rework or scrap 40 per cent of his output because of spoilage during production. A Battelle research program found ways to reduce this overall rejection figure to between five and seven per cent.

The U. S. Air Force needed an electronic resistor for its jet planes. The resistor had to withstand humidity and salt-spray conditions, and function through a temperature range from —65° to 200°C without its rated value changing appreciably. As many as one thousand of these tiny electrical parts are used in a jet plane, and the development of suitable resistors was necessary for the country's defense program. Battelle's materials engineers, physicists, electronic and electrical engineers, ceramists, and coatings chemists worked on the problem and produced a resistor which met Air Force specifications.

A watch company guarantees that the mainspring in its watches will never break. The spring is made from an eight-metal alloy developed by Battelle metallurgists. Nearly ten years of research were required to develop the alloy, which has been acclaimed as the greatest development in watchmaking since the introduction of jeweled bearings.



Top — Determining the heat transfer of an experimental refractory brick for industrial furnaces. Center — With this Battelle-developed application of ultrasonics, interior flaws in metal can be readily detected without damage to the metal. Bottom — Chemical polishing is a simple, Battelle-developed process suitable for polishing articles of intricate form, ranging from jewelry to precision mechanical parts.

THOSE WE SERVE

Air Reduction Company, Inc.
Ajax Metal Company
Allegheny Ludlum Steel Corporation
Allis-Chalmers Manufacturing Company
Alloy Casting Institute
Aluminum Company of America
American Association of Oilwell Drilling Contractors
American Bosch Corporation
American Brake Shoe Company
American Education Press
American Gas Association
American Iron and Steel Institute
American Metal Company, Ltd., The
Anaconda Copper Mining Company
Anchor-Hocking Glass Corporation, The
Apex Electrical Manufacturing Company
Armco Steel Corporation
Armstrong Cork Company
Association of American Railroads
Atlantic Refining Company, The
Babcock & Wilcox Company, The
Baldwin Locomotive Works, The
  Cramp Brass & Iron Foundries Division
Bausch & Lomb Optical Company
Beech-Nut Packing Company
Bendix Aviation Corporation
  Scintilla Magneto Division
Bergstrom Paper Company
Bethlehem Steel Company
Bituminous Coal Research, Inc.
Bolivian Tin & Tungsten Mines Corporation
Book Manufacturers' Institute, Inc.
Borden Company, The
Brassert, H. A., & Company
Brazilian National Steel Commission
Brush Development Company, The
Budd Induction Heating, Inc.
Bunting Brass & Bronze Company, The
Calcium Chloride Association
Cambridge Tile Manufacturing Company, The
Campbell, Wyant & Cannon Foundry Company
Canadian Copper Refiners
Carnegie-Illinois Steel Corporation
Champion Paper & Fibre Company, The
Champion Spark Plug Company
Chicago Retort & Fire Brick Company
Chilean Nitrate Sales Corporation
Chromium Mining & Smelting Corporation, Ltd.
City Auto Stamping Company, The
Cleveland Cliffs Iron Company, The
Climax Molybdenum Company
Coe Laboratories, Inc.
Colorado Fuel & Iron Corporation, The
Commercial Solvents Corporation
Congoleum-Nairn, Inc.
Cooper-Bessemer Corporation, The
Copper & Brass Research Association
Copperweld Steel Company
Crucible Steel Casting Company, The
Cuban-American Manganese Corporation
Curtiss-Wright Corporation
Defiance Machine Works, Inc.
Dick, A. B., Company
Doehler Die Casting Company
Douglas Aircraft Company, Inc.
Dow Chemical Company, The
Drilling Research, Inc.
Du Pont, E. I., de Nemours & Company, Inc.
  Pigments Department
Duriron Company, Inc., The
Eagle-Picher Lead Company, The
Eastern Clay Products, Inc.
Eastman Kodak Company
Eberbach & Son Company
Edison Electric Institute
Electric Auto-Lite Company, The
Elgin National Watch Company
Esterbrook Steel Pen Manufacturing Company, The
Ethyl Corporation
Evergreen Mines Company
Exact Weight Scale Company, The
Falcon Bronze Company, The
Fansteel Metallurgical Corporation
Federal Glass Company, The
Federal-Mogul Corporation
Ferro Enamel Corporation
Ferro Engineering Company, The
Finishing Lime Association of Ohio, The
Firestone Steel Products Company
Foote Mineral Company
Ford, Bacon & Davis, Inc.
Ford Motor Company
Fostoria Glass Company
Frampton, D. B., & Company
Freeport Sulphur Company
General Electric Company
Geophysical Research Corporation
Glidden Company, The
Globe Steel Abrasive Company, The
Goodyear Tire & Rubber Company, The
Gravure Research, Inc.
Gray Iron Research Institute, Inc.
Great Lakes Carbon Corporation
Green, A. P., Fire Brick Company
Haloid Company, The
Handy & Harman
Hanna, M. A., Company, The
Harbison-Walker Refractories Company
Heekin Can Company, The
Heller Brothers Company of Ohio
Hobart Brothers Company
Hooker Electrochemical Company
Hoover Company, The
Hoskins Manufacturing Company
Houdaille-Hershey Corporation
Hughes Tool Company
Hydro-Blast Corporation, The
Illinois Zinc Company
Independent Oxygen Manufacturers' Association
Industrial Nucleonics Corporation
Inland Steel Company
Interlake Chemical Corporation
Interlake Iron Corporation
International Business Machines Corporation
International Harvester Company
International Minerals & Chemical Corporation
International Nickel Company, Inc.
Ironsides Company, The
Jackson Iron & Steel Company, The
Jeffrey Manufacturing Company, The
Jones, S. M., Company, The
Jones & Laughlin Steel Corporation
Kaiser-Frazer Corporation
  Detroit Engine Division
Kaiser Steel Corporation
Kelley Island Lime & Transport Company, The
Kellogg, M. W., Company
Kendall Refining Company
Kennecott Copper Corporation
Kohler Co.
Koppers Company

A Partial List of Companies That Have Sponsored Research at Battelle

Ladish Drop Forge Company
LaSalle Steel Company
Lauhoff Grain Company
Lead Industries Association
Lennon Wall Paper Company
Libbey-Owens-Ford Glass Company
Linde Air Products Company, The
  Unit of Carbide and Carbon Corporation
Lithaloys Corporation
Lodge & Shipley Machine Tool Company, The
Lunkenheimer Company, The
Magnaflux Corporation
Mallory, P. R., & Company, Inc.
Manning, Maxwell & Moore, Inc.
Marion Steam Shovel Company, The
Mathieson Chemical Corporation
McKee, Arthur G., & Company
Mead Corporation
Meaker Company, The
Mergenthaler Linotype Company
Minneapolis-Honeywell Regulator Company
Minnesota Mining & Manufacturing Company
Mississippi Glass Company
Monsanto Chemical Company
Murray Corporation of America, The
National Aluminate Corporation
National Cash Register Company, The
National Distillers Chemical Corporation
National Lead Company
National Safety Council
Natural Gasoline Association of America
New Jersey Zinc Company, The
Niagara Alkali Company
Noranda Mines, Ltd.
Norton Company
Oglebay Norton & Company
Ohio Edison Company
Ohio Plate Glass Company
Ohio Steel Foundry Company, The
Olin Industries, Inc.
Oliver Iron Mining Company
Ottawa Silica Company
Owens-Corning Fiberglas Corporation
Pan American Refining Corporation
Pangborn Corporation
Parker Pen Company, The
Patino Mines & Enterprises Consolidated, Inc.
Pennsylvania Grade Crude Oil Association
Pennsylvania Salt Manufacturing Company
  Research and Development Division
Pennsylvania Water & Power Company
Pepsi-Cola Company
Perfect Circle Company, The
Pfaudler Company, The
Phelps Dodge Corporation
Philco Corporation
Photo-Engravers Research, Inc.
Pickands Mather & Company
Pittsburgh Consolidation Coal Company
  Research and Development Division
Pittsburgh Lectromelt Furnace Corporation
Pittsburgh Plate Glass Company
Printing Plates Research, Inc.
Proctor & Gamble Company, The
Radio Corporation of America
  RCA Laboratories Division
Ranco, Inc.
Rare Earths, Inc.
Raybestos-Manhattan, Inc.
Ray-O-Vac Company
Reader's Digest Association
Remington Arms Company, Inc.
Republic Steel Corporation
Resinous Products & Chemical Company, The
Reynolds Metals Company
Rohm & Haas Company, The
Sandusky Foundry & Machine Company
Scott, O. M., & Sons Company
Sepco Corporation
Shallcross Manufacturing Company
Shell Oil Company, Inc.
Shenango-Penn Mold Company
Sherwin-Williams Company, The
Smith, A. O., Corporation
Smith Agricultural Chemical Company, The
Southern Pacific Company
Standard Oil Development Company
Standard Steel Spring Company
Staso Milling Company
Steam Locomotive Research Institute
Steel Shipping Container Institute, Inc.
Sterling Silversmiths Guild of America
Stoker Manufacturers' Association
Surface Combustion Corporation
Tennessee Coal Iron & Railroad Company
Texas Eastern Transmission Corporation
Texas Mining & Smelting Company
Thermoid Company
Thompson Products, Inc.
Tile Manufacturers' Association, Inc., The
Time, Inc.
Timken Roller Bearing Company
Tin Research Institute
Toledo Scale Company
Truck Manufacturers Engineers Committee
Union Bag & Paper Company
United Aircraft Corporation
  Pratt & Whitney Division
United Engineers & Constructors, Inc.
United States Government
  Department of Agriculture
  Department of Air Force
  Department of the Army
  National Advisory Committee for Aeronautics
  Department of the Navy
  Public Health Service
United States Metals Refining Company
United States Pipe & Foundry Company
United States Playing Card Company, The
United States Potash Company
United States Time Corporation
Universal Oil Products Company
Utilities Coordinated Research, Inc.
Utilities Research Commission
Uxbridge Worsted Company, Inc.
Virginia Smelting Company
Vitrified China Association, Inc.
Warner & Swasey Company, The
Wean Engineering Company, Inc., The
Weirton Steel Company
Wellman, S. K., Company, The
Western Electric Company, Inc.
Westinghouse Electric Corporation
West Virginia Steel & Manufacturing Company
White, S. S., Dental Manufacturing Company, The
Whiting Corporation
Wolf Machine Company, The
Worthington Pump & Machinery Corporation
Wyandotte Chemicals Corporation
Youngstown Sheet & Tube Company, The

ARRANGEMENTS WITH SPONSORS

The usual method for setting up a research project is to meet with representatives of the sponsor to define the problem. When this has been done, and it is determined that an effective and mutually agreeable program can be developed, both cost and time can be estimated with a fair degree of accuracy. These are made a part of the contract, so that the sponsor knows his commitments in advance.

The cost of the research depends upon the scope and duration of the project. Costs consist of the actual charges for services of research and supervisory personnel and their technical and nontechnical assistants, materials, use of equipment, and undistributed expenses.

A research project is accepted as the responsibility of the Institute as a whole. It is assigned to the research division best qualified to handle it. By cooperative attack, lost motion and wasted efforts are eliminated and high efficiency is obtained.

Arrangements are made in advance for the type of research reports that will be mutually advantageous. These may be in the form of monthly letter reports, topical reports, quarterly reports, or otherwise as the sponsor may wish.

All discoveries made in the course of the work are assigned to the sponsor, and all research at Battelle is confidential. Only the sponsor has authority to approve the release of information.

BATTELLE FIELDS OF RESEARCH

CHEMISTRY CERAMIC TECHNOLOGY PHYSICS METALLURGY

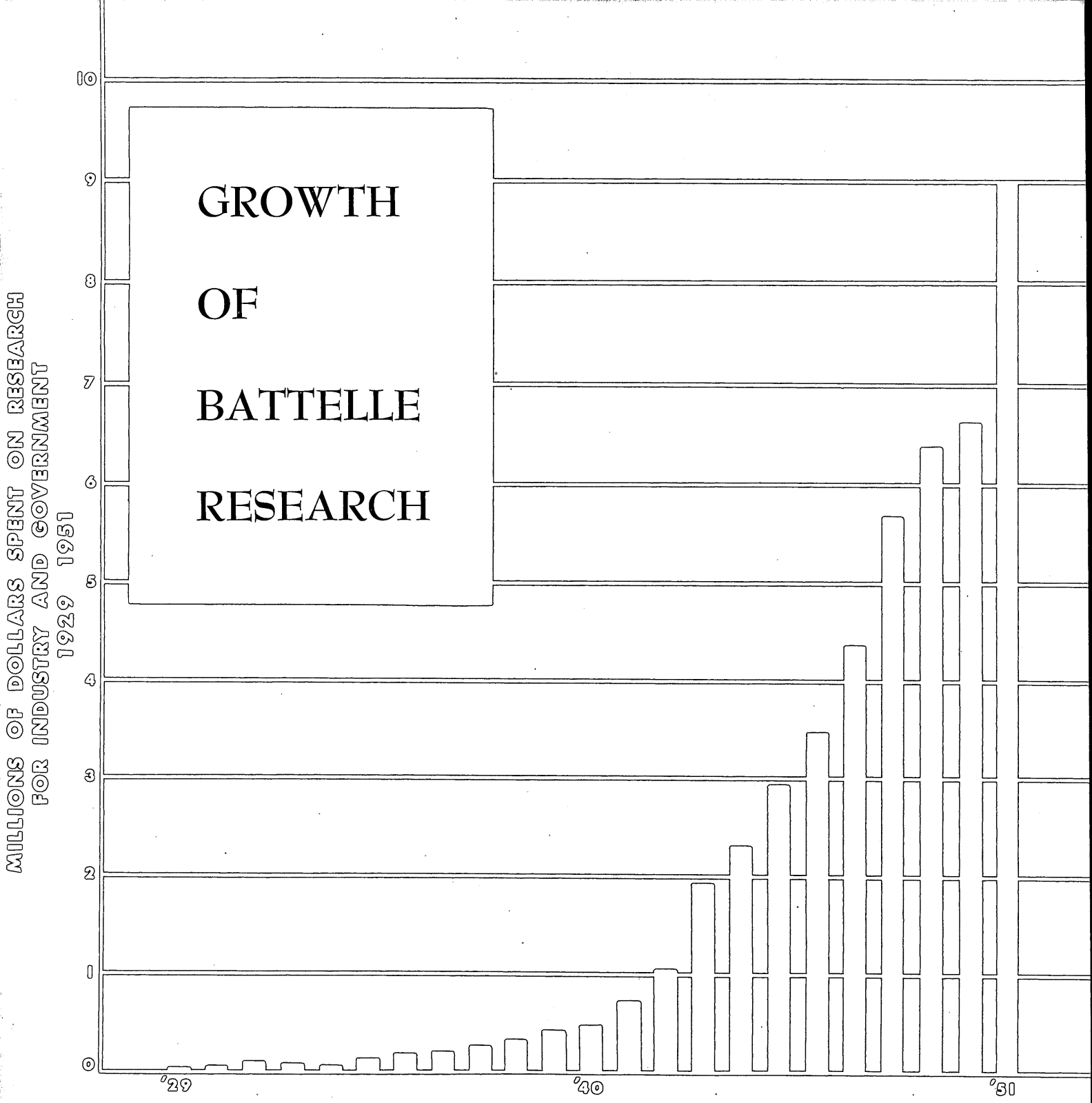
CHEMICAL ENGINEERING MECHANICAL ENGINEERING GRAPHIC ARTS TECHNOLOGY

WELDING TECHNOLOGY ELECTROCHEMISTRY AIR AND STREAM POLLUTION ELECTRONICS

MINERAL PROCESSING ENGINEERING ECONOMICS ELECTRICAL ENGINEERING

FUELS AND COMBUSTION AGRICULTURAL SCIENCES PLASTICS, RUBBER, AND PAINTS

PRODUCTION ENGINEERING THEORETICAL AND APPLIED MECHANICS NUCLEONICS



The Institute began operations in 1929 with a staff of 20 people. It spent the succeeding five years developing its research-for-industry plan. At the end of this time, its sponsored research amounted to $80,000. In 1951, the rate of Battelle research was $9,000,000 annually.

WE hope you have enjoyed your visit at Battelle. If we can be of any service to you, please feel free to call upon us.

November, 1951
Printed in U. S. A.
Second Printing, April, 1952

BATTELLE MEMORIAL INSTITUTE RESEARCH BUILDINGS

W. A. Welcker, Jr.

BATTELLE MEMORIAL INSTITUTE, COLUMBUS, OHIO

5

BATTELLE MEMORIAL INSTITUTE RESEARCH BUILDINGS

W. A. Welcker, Jr.

Battelle Memorial Institute, Columbus, Ohio

A chapter from the book "Laboratory Design"
Published in 1951 by
Reinhold Publishing Corporation

Battelle Memorial Institute was founded in 1923 by the will of John Gordon Battelle, whose early death interrupted an industrial career of many diverse interests. He had experienced difficulty in finding suitable facilities for the solution of many of the problems he encountered in his varied industrial contacts. His keen insight into the need for research facilities available to industry, and his generosity and desire to further the advancement of industry through scientific research and education, was manifest by the terms of his will. By its terms a nonprofit research foundation was created to carry on research and education in the fields of metals, fuels, and allied industries. Mrs. John Gordon Battelle, the mother of the founder, died in 1925, leaving the bulk of her estate to endow the Institute further. The Institute opened its doors for service late in 1929.

The endowment provides funds for buildings and permanent equipment as well as for the support of fundamental research and research education. Although a considerable amount of effort has been spent in this type of research, the major activities of the Institute have always been research for industry and, of recent years, for government.

There has been a steady and constant growth since the opening of the Institute in 1929 with a staff of less than thirty people in one building. Today the staff numbers 1300 occupying a total of nearly a half-million square feet of laboratories. The rate of research expenditure has rapidly risen from a few thousand dollars in 1929 to a figure in excess of $6,000,000 in 1949.

GENERAL FIELDS OF OPERATION

In the beginning the research efforts of the Institute were directed principally to metallurgical and fuels problems. The scope of the Institute's research has been constantly expanding since that time. The provision of facilities to meet the ever-expanding, ever-changing needs has presented many problems of space, arrangement, and facility capacity. In general, the fields of research endeavor today include: industrial physics, electronics, theoretical and applied mechanics, physical chemistry, organic chemistry, electrochemistry, fuels and combustion, ceramic technology, mineral processing, physical, processes, ferrous and nonferrous metallurgy, high-temperature alloys, welding, foundry technology, metals and chemicals in agriculture, science and technology of the graphic arts, technical-economic surveys, and mechanical engineering research.

SITE

The location of Battelle in Columbus, Ohio, places its facilities within easy reach of many of this country's industrial centers, since Columbus is centrally located and has good travel facilities both by rail and air. This location is advantageous both from the point of view of ease of contact with industry and the accessibility of markets that furnish the many materials and supplies needed to carry on research operations.

The permanent laboratory buildings are located in a

residential area close to the Ohio State University campus. The location affords a freedom from industrial dirt and heavy traffic vibrations. The nearness to the University enables a close cooperation between the two institutions.

In addition to the main location, the Institute has a six-acre industrial site located approximately one mile away, serviced by a rail spur, providing space for special pilot plants on a large scale and for agricultural test plots and greenhouse facilities. Rapid expansion of the research program and difficulties arising from construction material shortages in recent years have resulted in temporary use of leased space to house new divisions of research until more permanent quarters can be built. This allows a more thorough study of requirements to be made before permanent buildings are designed, thus providing experience useful in planning permanent quarters.

The ever-changing requirements of research have made it very difficult for Battelle to standardize on any one or even several standard types of laboratories. For instance, the space requirements and arrangements for research in printing plates are vastly different from those of process metallurgy, or the requirements for microchemical work, or fuels research with full-scale equipment, or agricultural research with growing plants. Not only do the many broad fields of research at Battelle require facilities of a different nature, but each of the specific fields needs many different arrangements of space and facilities to carry through from the test tube to semi-production stages.

In so far as possible, service laboratories have been set up at Battelle to carry a large part of the semi-routine work and service activities. These include photographic, metallographic, mechanical testing, heat treating, analytical, and x-ray laboratories, as well as machine shops, carpenter shop, and glass blowing shop. Research workers may either submit samples to these laboratories or call on these facilities for assistance.

PERMANENT BUILDINGS

The permanent buildings are located on three adjacent city blocks and cover about one half of the area of each of the blocks.

The architecture of the original building is classic in detail. As additional buildings have been added, this style has been modified, omitting the classic cornice and detail but still retaining a unity of mass balance and approximately the same fenestration spacing. These permanent buildings are of reinforced concrete and steel construction, with red brick facing and Bedford limestone trim. They are surrounded by extensive lawns, shrubs, and trees to give a pleasing setting and academic atmosphere.

All of the buildings are connected by pipe and service tunnels of sufficient size that they may be used by the staff in going from building to building during bad weather.

Since the buildings were built at different times and were designed to handle different kinds of work, each building is described as a unit. These buildings are designated as, and were built in the order named: King Avenue Building, Process Metallurgy Building, Tisdale Building, Fifth Avenue Building, and Seventh Avenue Building. The Agricultural Laboratory is located on a separate plot and is considered separately.

KING AVENUE BUILDING

The original King Avenue Building, the north and west wings of which were designed by Otto C. Darst, was built in 1928 and 1929 and has 90,000 square feet of floor space. It is an L-shaped structure approximately 160'0" by 200'0" with four floors and an attic. The attic space houses piping for the distribution of facilities and fans exhausting the hoods in the laboratories on the lower floors. Piped facilities are distributed from a loop of mains making a complete circuit of the outside perimeter of the attic, with feeders running down the inner face of the outside wall. Risers are spaced at approximately 24 feet, with each set serving two laboratories. Drain lines and return lines drop at the same locations as the feeders and collect in a 4'0" by 4'0" tunnel running completely around the building. In 1940, a five-story wing, 55'0" by 175'0", was added. This made the building a U-shaped structure having a total of 140,000 square feet.

The basement of the King Avenue Building houses a chemical pilot plant, tropicalization laboratory, store rooms for general supplies, x-ray laboratories, mechanical testing laboratories, machine shops, carpenter shop, large-scale fuels laboratory, creep laboratory, service machinery, electrical equipment rooms, telephone exchange, mail room, and fan rooms.

The first floor is occupied by a reception lobby, trustees' office, director's office, executive offices, library, museum, auditorium (seating 300 people), and a fuels laboratory.

The second and third floors are occupied by 85 single and multiple module laboratories and 35 offices devoted to corrosion research, instrument maintenance and repair, electronics, physics, photography, research chemistry, analytical chemistry, x-ray diffraction, electron-microscopy, spectroscopy, fuel-burning appliance research, calorimetric testing, constant-temperature rooms, paint research, flexible materials research, and first-aid room.

The fourth floor (attic) of the original part of the building is used for storage and distribution facilities. The fourth floor of the east wing includes a cafeteria and six chemical research laboratories.

The King Avenue Building has a 5-ton freight elevator serving all floors and a passenger elevator serving basement, first, second, and third floors. A small dumbwaiter also serves the main floors for deliveries. The large-scale fuels laboratory in the west wing has a section 50'0" by 30'0" with 35-foot head room and is served by a 5-ton crane. The chemical pilot plant

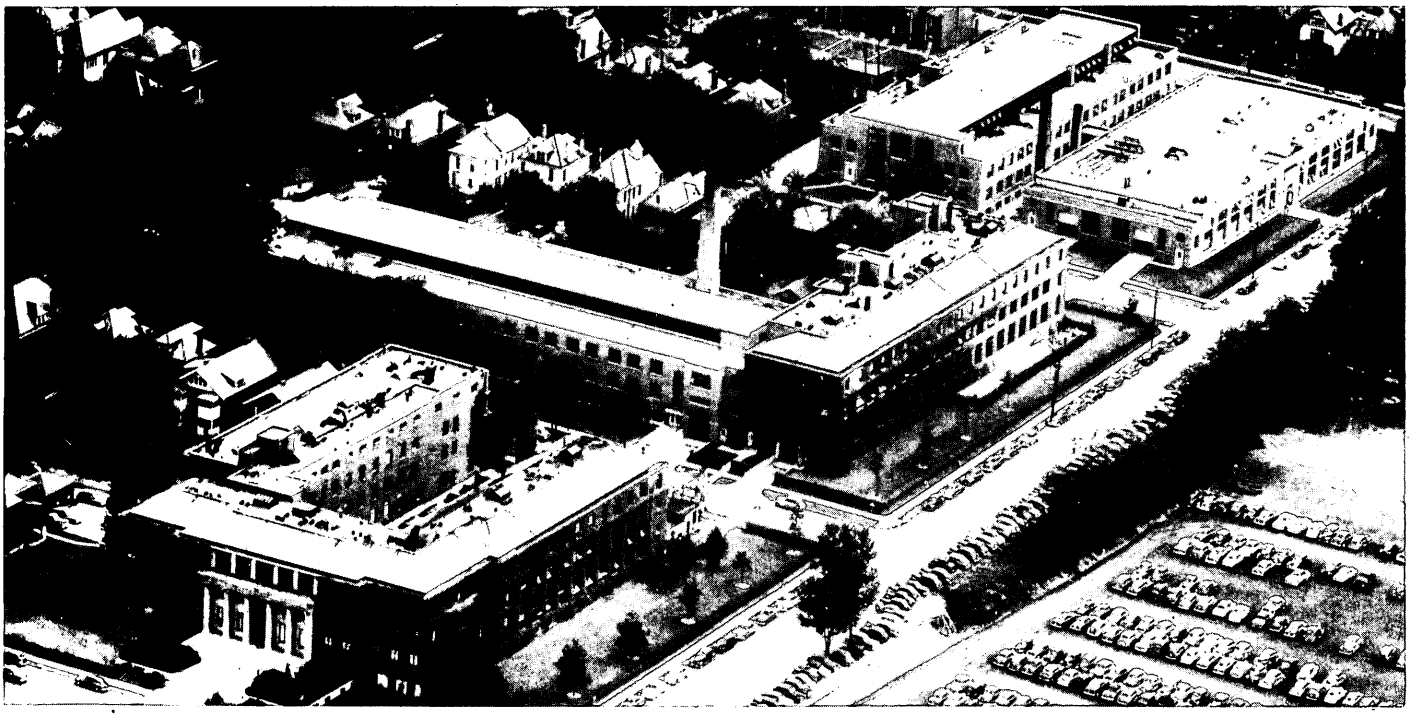


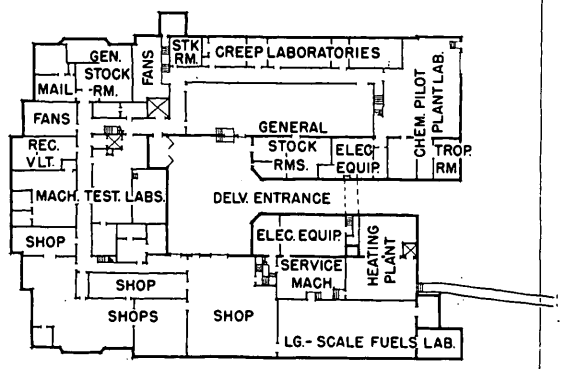
Figure 30 Aerial view of the principal buildings of Battelle Memorial Institute. These and auxiliary buildings provide approximately 500,000 square feet of office and laboratory space. They house 339 single-module laboratories, 80 multiple-module laboratories, 30 large work areas and 136 offices.

laboratory in the east wing has a section 25'0" by 54'0" with 23-foot head room and is served by a 2-ton crane. This laboratory is also equipped with a 12-foot wide by 14-foot high door for use in bringing in large apparatus.

Partition walls in this building are of brick in the basement and plastered gypsum block in the upper floors. All partition walls are nonload bearing and can be changed at will. The floors are covered by a troweled-on mastic in the laboratories, and the corridors are terrazzo. The use of mastic floor covering has been very satisfactory, since it is easily repaired when damaged or worn through.

The main lobby walls are of St. Genevieve rose marble and the floor of travertine. The library and auditorium are paneled in oak and have rubber and linoleum tile floors. The walls of the museum are lined with built-in glass-front display cabinets and its floor is of marble. The trustees' office is a reproduction of Gordon Battelle's office. The original paneling and furnishings were taken from his office and installed in the Institute. This section of the building preserves a monumental memorial atmosphere while the design of the remainder of the Institute is more basically functional.

Story heights for the King Avenue Building are set at 11 feet for basement, 13 feet for first floor, 12 feet for second and third floors, and 10 feet 8 inches for the fourth floor. The live load capacities for floors are 150 pounds/square foot for the original L-shaped part of the building for all above-ground floors. In the east wing this capacity was increased to 200 pounds/square



KING AVENUE BUILDING

foot for all but the fourth floor which is 300 pounds square foot. These heavier loading capacities allow the use of heavy machinery, such as roll mixers, digesters, kilns, presses, and ovens, so that both small and large equipment needed in a laboratory can be located in the same area.

PROCESS METALLURGY BUILDING

The Process Metallurgy Building is a five-story structure, 250 feet long, located in the block south of the King Avenue Building. It has a total floor space of 70,000 square feet and is devoted almost entirely to mineral and metal processing, from the beneficiation of crude ores to melting and casting of special alloys. Dan A. Carmichael was the architect who designed this and the remaining buildings of the Battelle Memorial Institute.

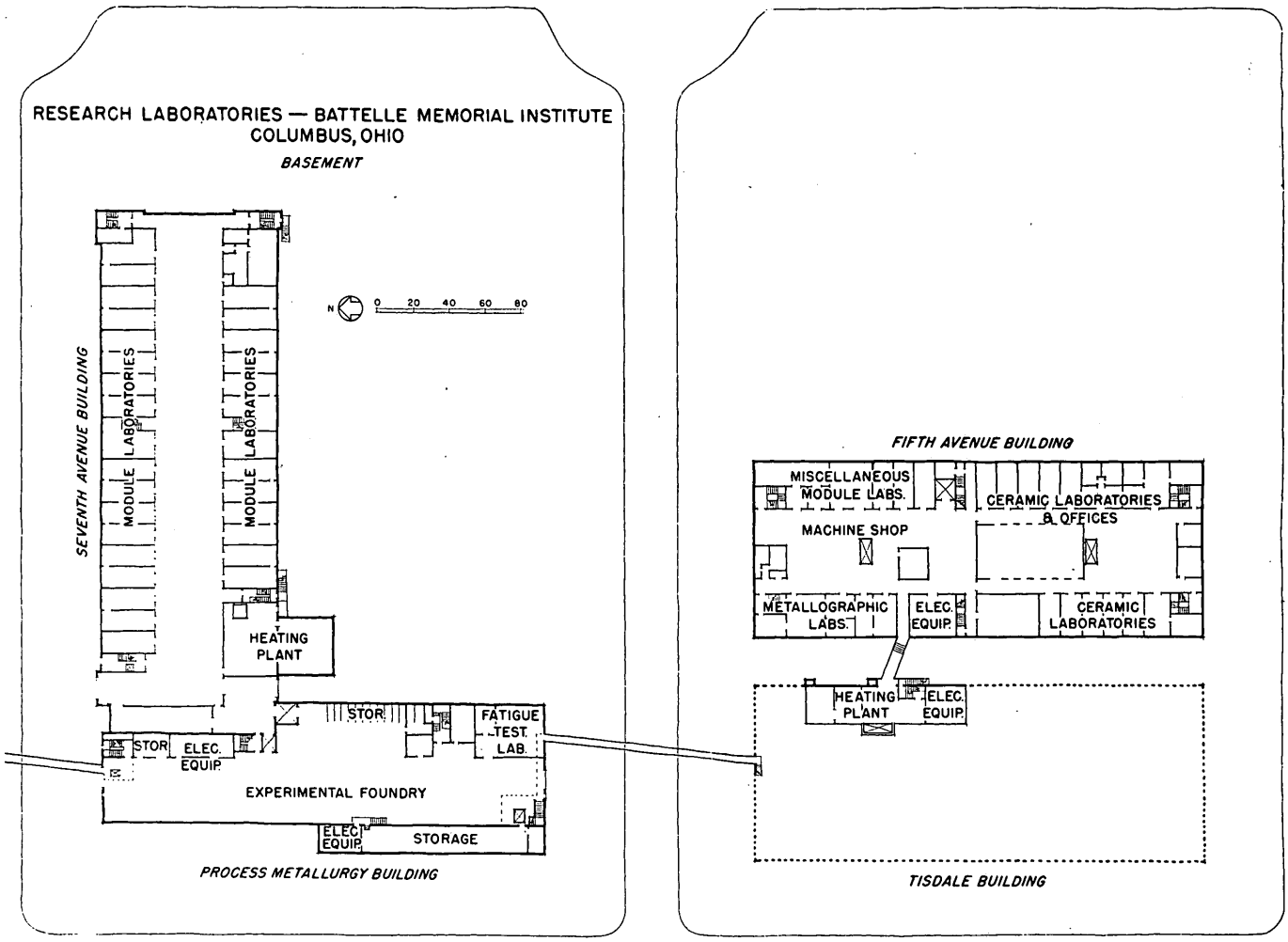
The first floor houses a complete experimental foundry for melting, casting, and cleaning of both ferrous and nonferrous materials. This area has 22 feet of head room. In this laboratory are located cupolas, electric-arc furnaces, induction furnaces, gas-fired pot furnaces, and crucible furnaces capable of handling melts of metal in any temperature range in open air, under vacuum or under controlled-atmosphere conditions. Charges may vary from a few ounces up to 500 pounds. Here complete equipment is installed for making sand molds, cores, etc., for the production of sand castings, precision castings, centrifugal castings, and ingots.

The entire foundry area is served by a 5-ton cab-controlled crane allowing easy handling of apparatus and heavy ladles or charges of metal. A special pit is built in the floor in front of each furnace so that large molds or ladles may be handily placed to receive the molten metal. These pits each have an adjustable platform which may be set at various depths in 6-inch increments. When not in use the platform is placed in its highest position and is level with the surrounding floor.

The foundry room has two large exhaust ducts running the full length of the room against the outer walls. These are of such capacity that better than 12 air changes per hour can be exhausted from the room. The ducts are equipped with openings every 10 feet in their length so that branches can be attached to vent special equipment.

The power requirements for electric furnaces are furnished from two transformer and generator rooms located one on either side of the foundry room. Special high-tension lines are installed as feeders to each piece

Figure 31 Basement floor plan.



of equipment having high current requirements. In addition to special lines, 3-phase, 220-volt and 110-volt single-phase outlets are located on the outer walls on approximately 12-foot centers. This arrangement provides readily available power for portable auxiliary equipment.

High-pressure air at 100 psi, natural gas at 15 psi and at 8 ounces, and city water are available at distribution points located every 24 feet along the outside walls.

The foundry floor is crossed by three tunnels allowing the various facilities to be brought up in mid-floor for special equipment.

Two large refractory-lined stacks are so located that they take out the hot gases from the cupolas and other fuel-burning melting equipment. These stacks discharge above the roof of the building.

A large storage area is provided in an adjacent basement for storing molds, flasks, patterns, furnaces and other special equipment used in the foundry. Storage bins for sand, melting stock and alloying materials are provided on the main foundry floor, so located that truck delivery can be made through chutes from the exterior of the building, and these materials are readily accessible.

A mezzanine floor, 148'0" by 30'0", is located along the south end of the east wall of the foundry room. A control room, machinability laboratory, foundry office, engineering materials laboratories, and cupola air conditioning and charging apparatus are located on this floor.

The second floor is devoted entirely to mineral processing research, including ore dressing, flotation, coal preparation, roasting, petrography, magnetic separation, and allied studies. Approximately 15,400 square feet are devoted to this work. One section of this floor, 55'0" by 33'0" has 22 feet of head room and is served by a 2-ton crane. On this floor the remainder of the floor has 11 feet of head room. A 12-feet wide balcony midway between the floor and the ceiling is provided for two-level pilot plant operations. A large hatch in this area under the crane provides a means of bringing up bulky equipment from ground level. The entire floor is provided with drains and the floor is pitched at a slope of ⅜ inch/foot to facilitate the disposal of excess process water. Constant-head tanks are located in penthouses on the roof of the building and connected to this area with distribution pipes for use on low-pressure beneficiation apparatus. Outlets for 3-phase, 22-volt and single-phase, 110-volt electric power are located at intervals of 12 feet along the outside walls and on cross beams in the ceiling. Air, gas, water and steam outlets are located at 10-foot intervals around this outside wall.

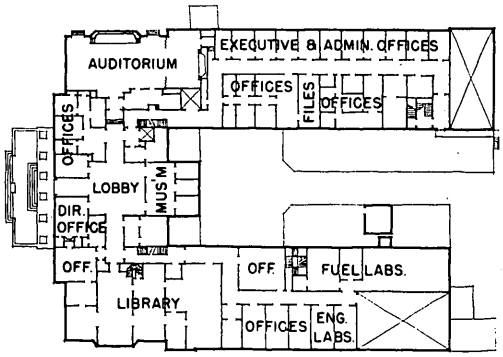
Seven small laboratories for special phases of this work, 13 staff offices, and a small equipment shop are located on this floor.

The third floor contains 21 laboratories and 13 offices devoted to small-scale metallurgical work. The fourth floor contains 13 laboratories and two offices principally used for plastic research. This floor also contains a specimen storage area of approximately 5000 square feet.

All floors are served by a 5-ton combination passenger and freight elevator. The first floor, mezzanine, and second floor are also served by a second four-ton freight elevator. The live-load capacities of the floors are as follows: first floor, no limit; mezzanine, 500 pounds/square foot; second floor, 300 pounds/square foot; third floor, 200 pounds/square foot; and fourth floor, 300 pounds/square foot.

SEVENTH AVENUE BUILDING

The Seventh Avenue Building, occupied in the fall of 1949, is located east of the north end of the Process Metallurgy Building and joining it. This is a 290'0" long by 100'0" wide structure with full basement, two first floor mezzanines—one on either side for the entire length of the building—and a full second floor. On all three floors individual laboratories are arranged along the outside wall for the length of the building. There are 103 laboratory module spaces. On the basement floor the space in the center of the building between



KING AVENUE BUILDING

the individual laboratories has a head room of 22 feet and is served by a 5-ton cab-controlled crane. This area is 38 feet wide by 260 feet long, with large truck entrances. The space above this area on the second floor also is pilot-plant space. It is covered by a monitor roof providing natural light and a head room of 21 feet and is served by a 2-ton cab-controlled crane. A hatch in the second floor under the crane and above the truck entrance allows an easy means of placing large equipment on the second floor. All floors are served by a 4-ton freight elevator.

Live load floor capacities for this building are unlimited for the basement floor, 200 pounds/square foot for individual laboratories, and 300 pounds/square foot for the second-floor pilot-plant area.

Framing of the building provides for eight refractory-lined stacks to carry out hot gases and discharge them above the roof.

Piped facilities are fed from mains circulating around the basement ceiling near the outside wall and risers are located every 25 feet. Each set of risers feeds two laboratory modules.

Electric power is distributed from six 600-ampere bus lines, one on each side of the building on each floor, distributing 220-volt 3-phase, 60-cycle current. Single-phase, 110-volt power is taken off these buses through dry-type transformers at appropriate intervals.

TISDALE BUILDING

The Tisdale Building is located in the block south of the Process Metallurgy Building. This building is 250'0" by 100'0". It is divided into two large work areas each 250'0" by 50'0". Eighteen control offices and small laboratories are located along the west wall on the first floor and mezzanine levels of one of these large areas. This entire building, with the exception of the offices, has a head room of 23 feet to the roof and 18 feet under roof trusses.

The west work area is devoted to two large laboratories, one for heat treating of metals and the other for electrochemical research.

The east work area is devoted to metal working (forging, rolling, swaging, wire-drawing, etc.), large-scale fatigue studies, welding research, and a locomotive model laboratory.

A small basement is located under a portion of this building, housing heating, power, and general facility equipment.

All piped facilities—air, gas, water, steam, etc.—are distributed through floor trenches. A main trench runs

Figure 32 First floor plan.

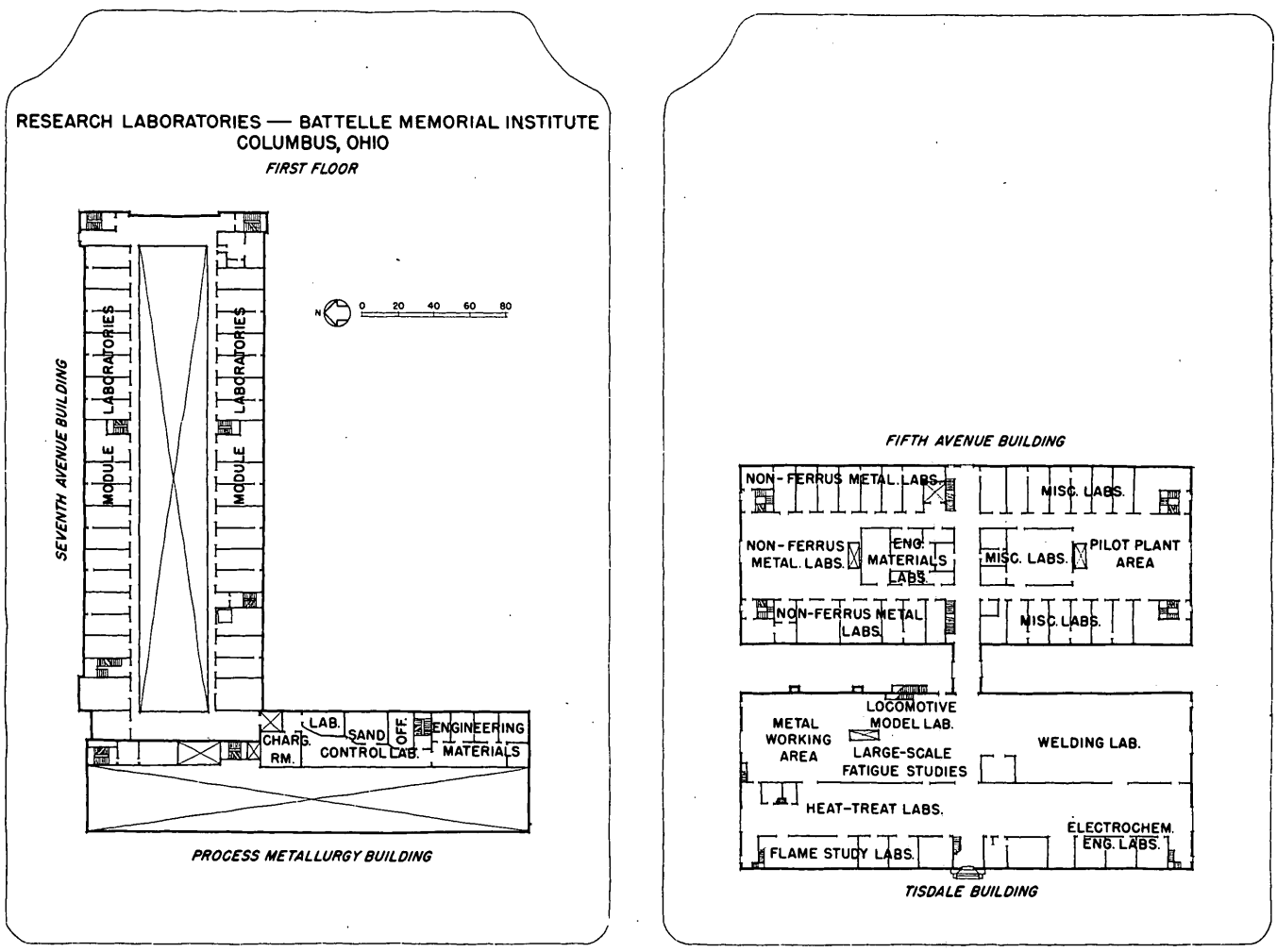


Figure 33 is a photograph of a representative module unit laboratory of the Battelle Memorial Institute. Each unit laboratory is equipped with a laboratory table serviced with compressed air, gas, steam, hot water, cold water, drains, safety shower, fume hood, single-phase 110-volt AC, and three-phase 220-volt AC. Some laboratories are equipped with additional facilities as needed, such as vacuum, distilled water, DC power and special gases.

the entire length of the building along the west side of the center wall and smaller cross trenches are located at 34-foot intervals connecting the center trench with continuous trenches running around the outside wall. These trenches are equipped with drains and are covered with steel checker plates.

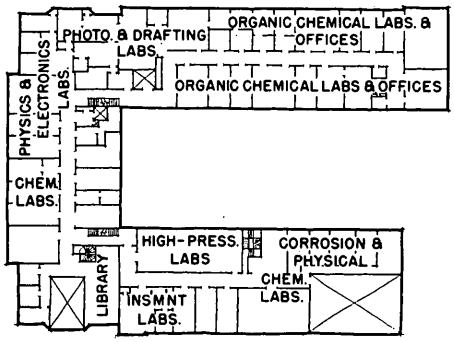
Electric power is distributed for general use through two 600-ampere, 3-phase, 220-volt bus branches. Single-phase, 110-volt power is distributed from 16 twenty-four-circuit panels, each serving equal areas. Special transformers for heat-treating laboratory power are located in the basement. Eight special generators and several rectifiers furnish the DC current required by the electrochemical laboratories.

The entire east area is served by a 2-ton crane and the roof truss design is such that a 2-ton load may be suspended from any panel point of the trusses. The entire area, except mezzanine offices, allows unlimited floor loading. Large truck doors are located at each end of both the east and west areas.

FIFTH AVENUE BUILDING

The Fifth Avenue Building is located east of the Tisdale Building and is connected by a 12-foot-wide passageway. This building is also 250'0" by 100'0". It has a full basement, first floor, and two mezzanine floors running the full length of the building, one on each side. A section of floor 102'0" by 48'0" in the center of the building connects the two mezzanines.

That portion of the building between the two mez-



KING AVENUE BUILDING

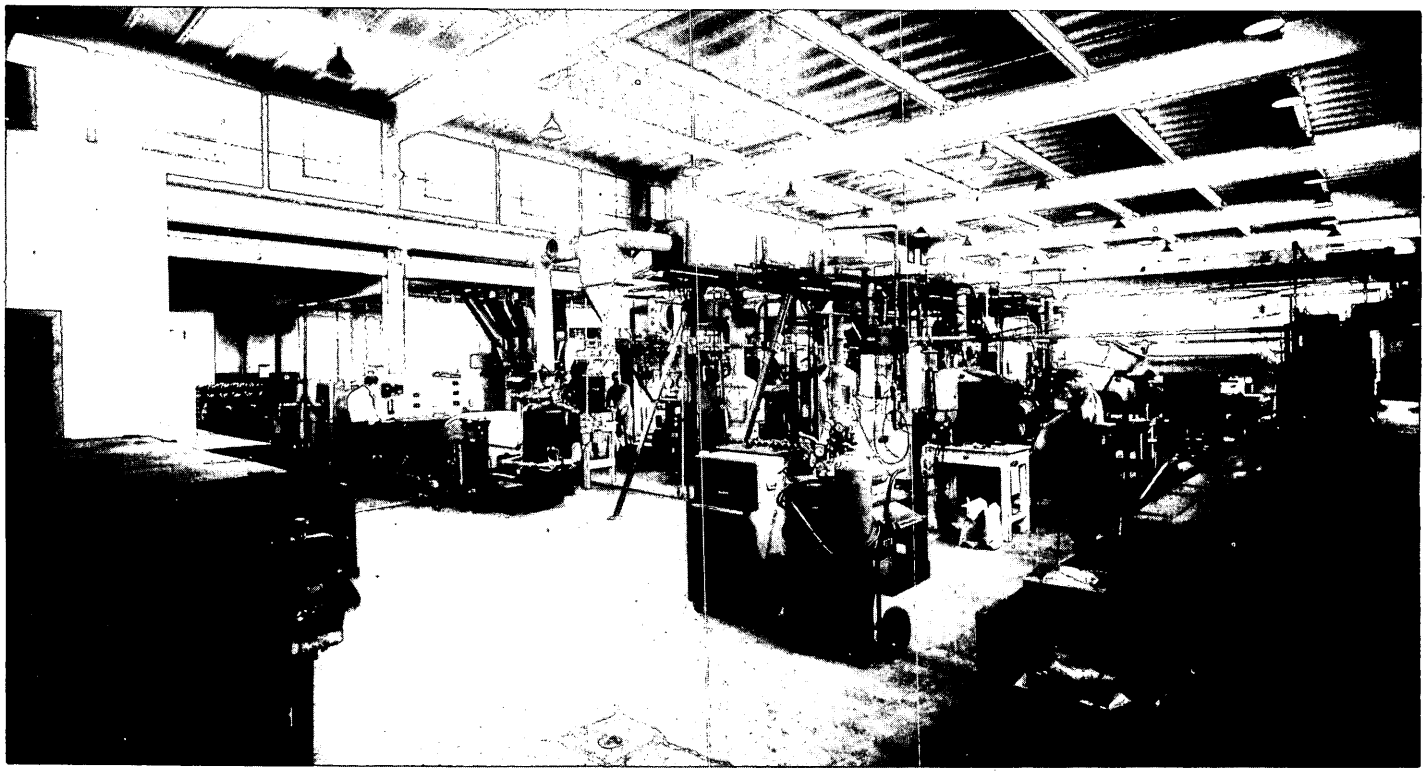
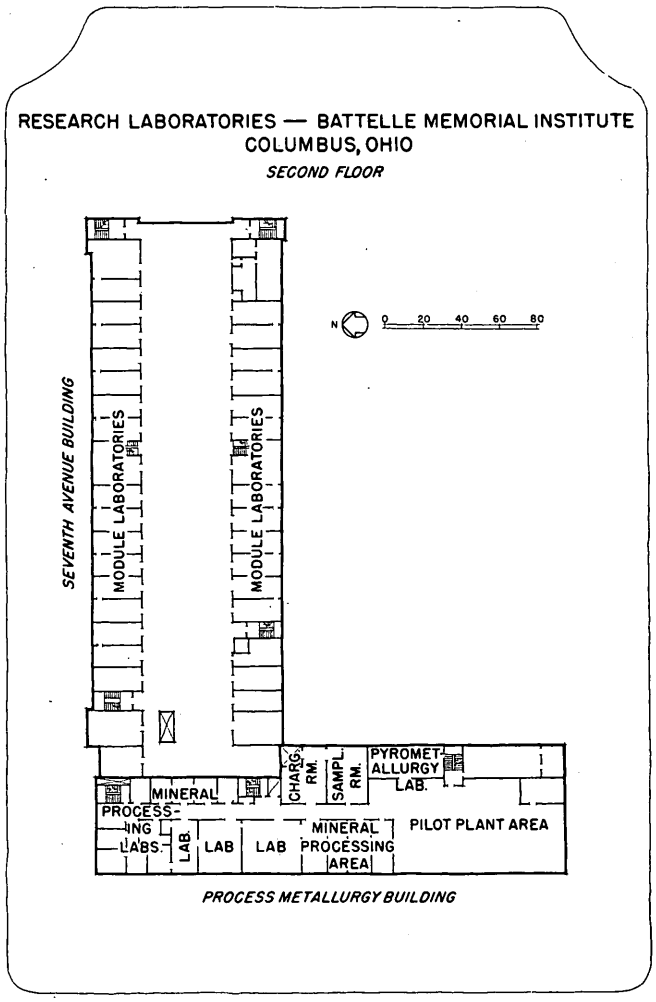
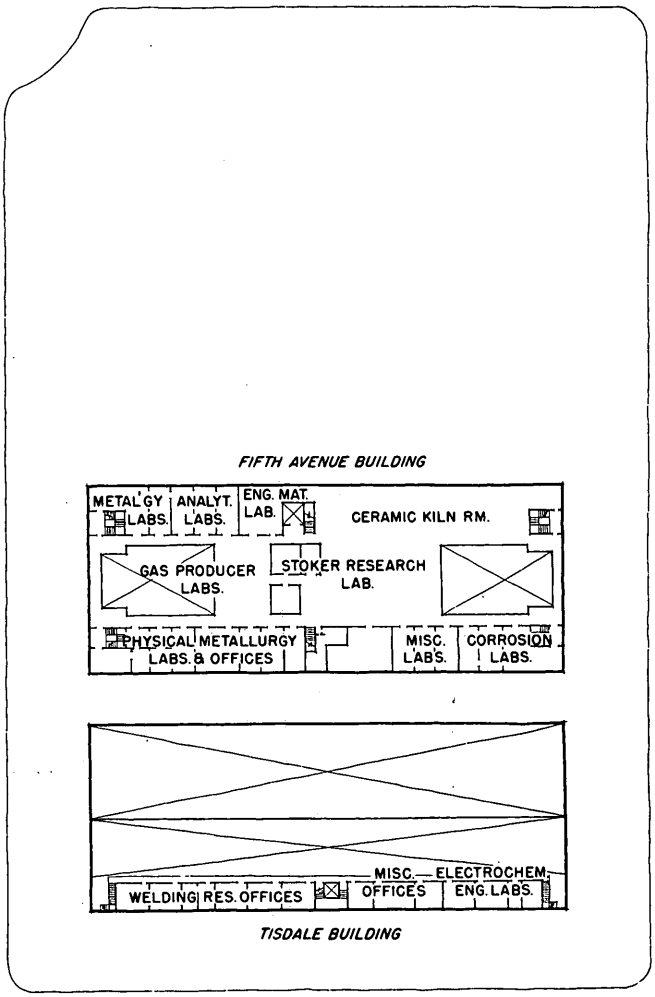


Figure 34 A section of the fuels laboratory on the second floor of the Fifth Avenue Building. This area is devoted to stoker development.

Figure IV.35 Second floor plan.





zanines has a monitor roof providing light and ventilation to the inner part of the building. This area is served by a 5-ton cab-controlled crane. There are two large hatches in the first floor under the crane for lowering large equipment into the basement. At each end of the building on the first-floor level is a large industrial laboratory approximately 74'0" by 48'0", with 30-foot head room. A large truck door serves each of these laboratories.

The basement floor has unlimited load-bearing capacity. The first floor slab was designed for 400 pounds/square foot live load, with supporting steel adequate for 250 pounds/square foot uniform loading. This allows the placing of heavy machines on this floor. The mezzanine floor is designed for 150 to 200 pounds/square foot load.

Four refractory-lined stacks are provided in the south half of the building, and the framing of the north end provides openings through the roof for four additional stacks as they are needed. These stacks are used to carry out the fumes and hot gases from special fuel burning equipment, kilns, and other sources.

Ceramic, metallographic, nonferrous, special metallurgical, fuels, electrical engineering, engineering materials, and miscellaneous laboratories are housed in this building. There are 72 laboratories and 24 offices, in addition to the pilot plant areas. Service departments, including glass blowing and machine shops, are also located here.

Each of the 72 unit laboratories, as well as the larger pilot plant laboratories, have compressed air, gas, steam, hot water, cold water, 220-volt, 3-phase and 110-volt, single-phase electricity and hood exhausts as required. The piped facilities are fed from mains placed in the basement ceiling and running near and parallel to the outside walls.

AGRICULTURAL LABORATORIES

Battelle's research in metals and chemistry has instigated a vital interest in the use of trace elements and industrial by-products in agriculture. Many of these researches are conducted in a special laboratory structure. This laboratory includes facilities for soil and produce chemistry studies, soil preparation, a greenhouse wing, and outside test plots.

TEMPORARY FACILITIES

The rapid growth of research activity has necessitated the use of several temporary buildings.

At present the Graphic Arts and Mechanical Engineering Research Divisions are occupying rented buildings. Additional leased space is also used for storage warehouses. Several former residences adjacent to the permanent buildings are used for offices.

STANDARD MODULE LABORATORY

The standard unit module laboratory is a room approximately 22'0" by 11'6" with a 3'0" by 7'0" door entering from a corridor at one end, and a window approximately 54 inches wide by 6 feet high at the other end. An "Alberene" stone-topped laboratory table is placed along one wall. This table is built on steel frames which support the stone tops independently so that storage cabinets can be set under the top between supports. This arrangement makes it possible to interchange cabinets. The top supports are so designed that they provide space for facility piping along the wall back of the storage space. They also support two wood shelves set above the table level against the wall. Air, gas, steam, water, vacuum and electrical outlets are placed above the bottom shelf. The tables measure 34 inches out from the wall and the stone tops are 25½ inches wide from front edge to a 3¾ inch curb supporting the bottom shelf. The shelves are 8½ inches wide. A ceramic sink 17" by 24" by 7" deep is installed in the approximate center of each laboratory table.

Cornell type "Transite" fume hoods are installed in three standard lengths—54 inches, 6 feet, and 8 feet. Each laboratory is equipped with one hood of the size required. Each hood is directly connected to an individual exhaust fan located on the building roof or in attic space. The exhaust ducts are fabricated of asphalt-covered sheet metal. The exhaust capacity for hoods is based on a minimum velocity of 100 feet/minute

Figure 36 Chemical engineering pilot-plant area in the basement of the King Avenue Building.

through the front opening of the hood and each hood is equipped with a damper to regulate the flow of air.

Three types of wood cabinets are installed under the laboratory tables. One type consists entirely of drawer space, a second type consists entirely of cupboard space and a third type has half cupboard and half drawer space.

Along the wall of the room opposite the laboratory table, office equipment and special laboratory equipment is placed.

Each laboratory is equipped with a safety emergency shower located over the entrance door. The shower is controlled by a quick acting positive valve located as near the light switch of the laboratory as possible. This location for the valve was chosen so that occupants of the laboratory can instinctively find it in case of emergency.

A floor drain is placed in each laboratory. All power outlets and light outlets are fed from separate circuits. Each laboratory in which fire hazard exists is equipped with a 15-pound CO_2 extinguisher. In all recently constructed laboratories a second door for emergency exit is placed in the wall opposite the laboratory table in the corner most distant from the entrance door. Inserts are placed in the ceiling of each laboratory on approximately 4-foot centers for the support of special equipment.

The Institute's many special laboratories differ greatly from the standard laboratories described above. These include constant-temperature, controlled-humidity rooms, dark rooms, tropicalization room, high-pressure laboratories, creep test laboratories, instrumentation and calibration rooms, x-ray and electron diffraction laboratories, and numerous others.

UTILITIES

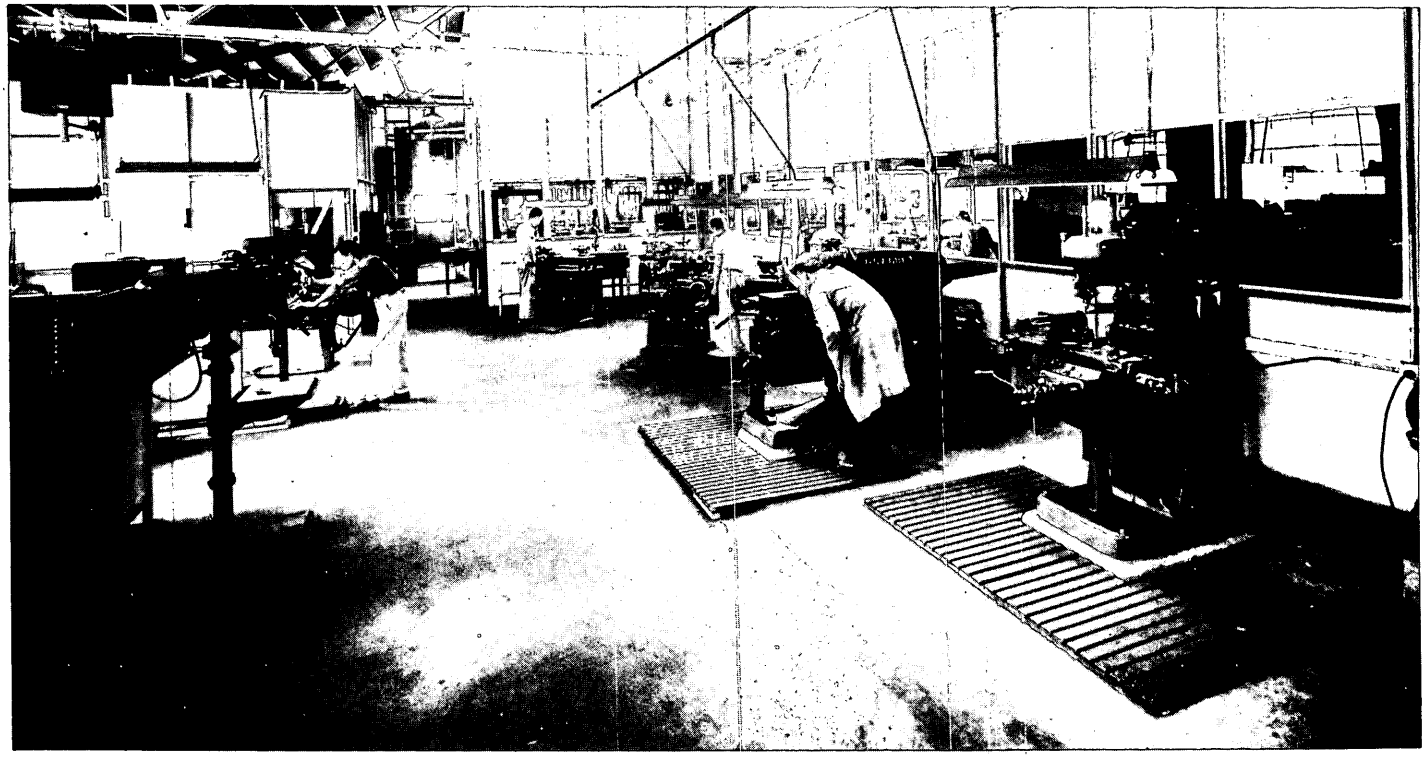
Electric power, natural gas, and water are purchased from the local utilities. The power company supplies two feeders: one, a 5000-KVA, 3-phase line at 13,200 volts, and the other, a 2000-KVA, 3-phase line at 4150 volts. Power distribution transformers fed from these lines are placed in each building and at special equipment locations.

Water is supplied to the buildings by two six-inch and two four-inch supply lines at 65 to 85 pounds/square inch pressure.

Natural gas is brought into the buildings by one 2-inch and one 4-inch line at 15-psi pressure. Pressure reducers are placed at various places in the buildings for supplying lower pressure gas as desired.

Both water and gas supply lines are connected from building to building so that failure of one supply will not close down operations.

Figure 37 This photograph shows a section of the mechanical engineering laboratory at Battelle. This laboratory is devoted to research in design and mechanical process improvement. It includes offices, drafting rooms, and complete model shops.



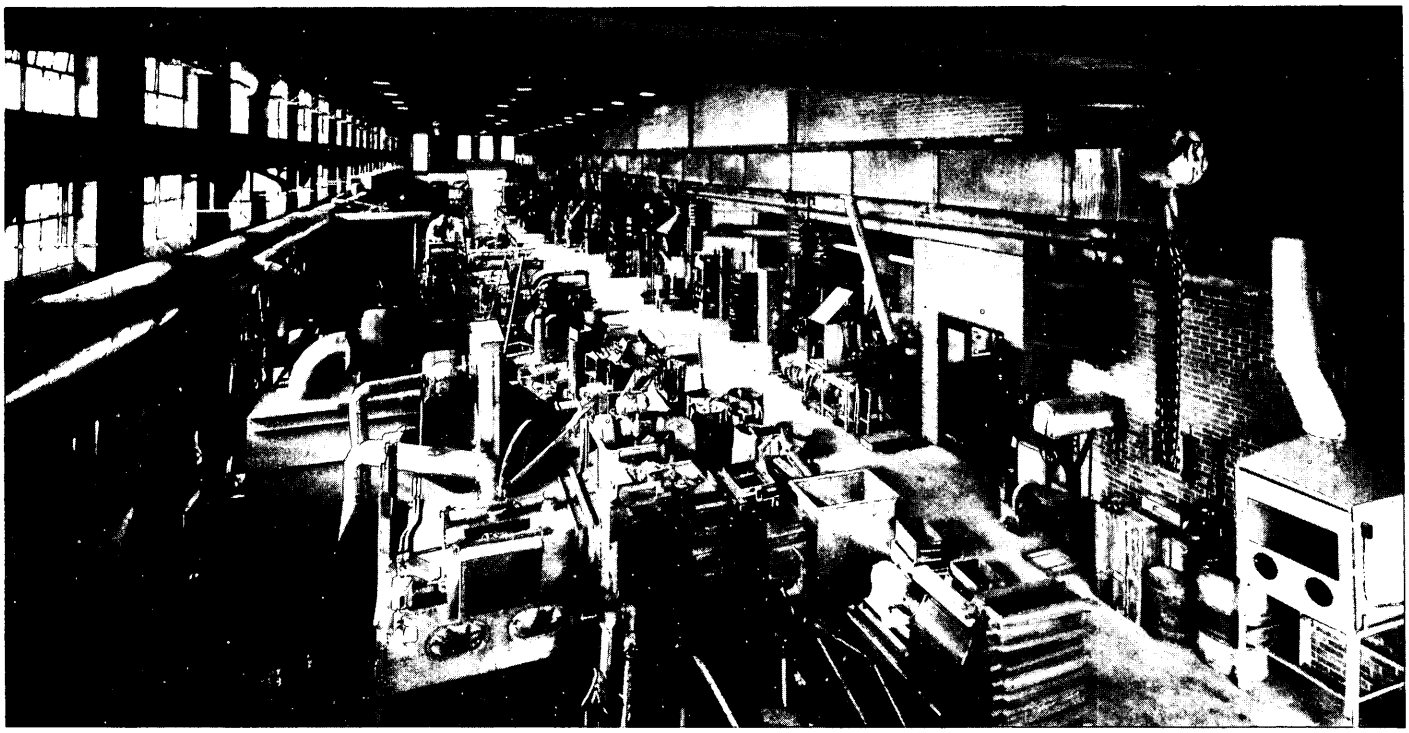


Figure 38 A section of the experimental foundry on the first floor of the Process Metallurgy Building. This area is devoted to the melting and casting of metals.

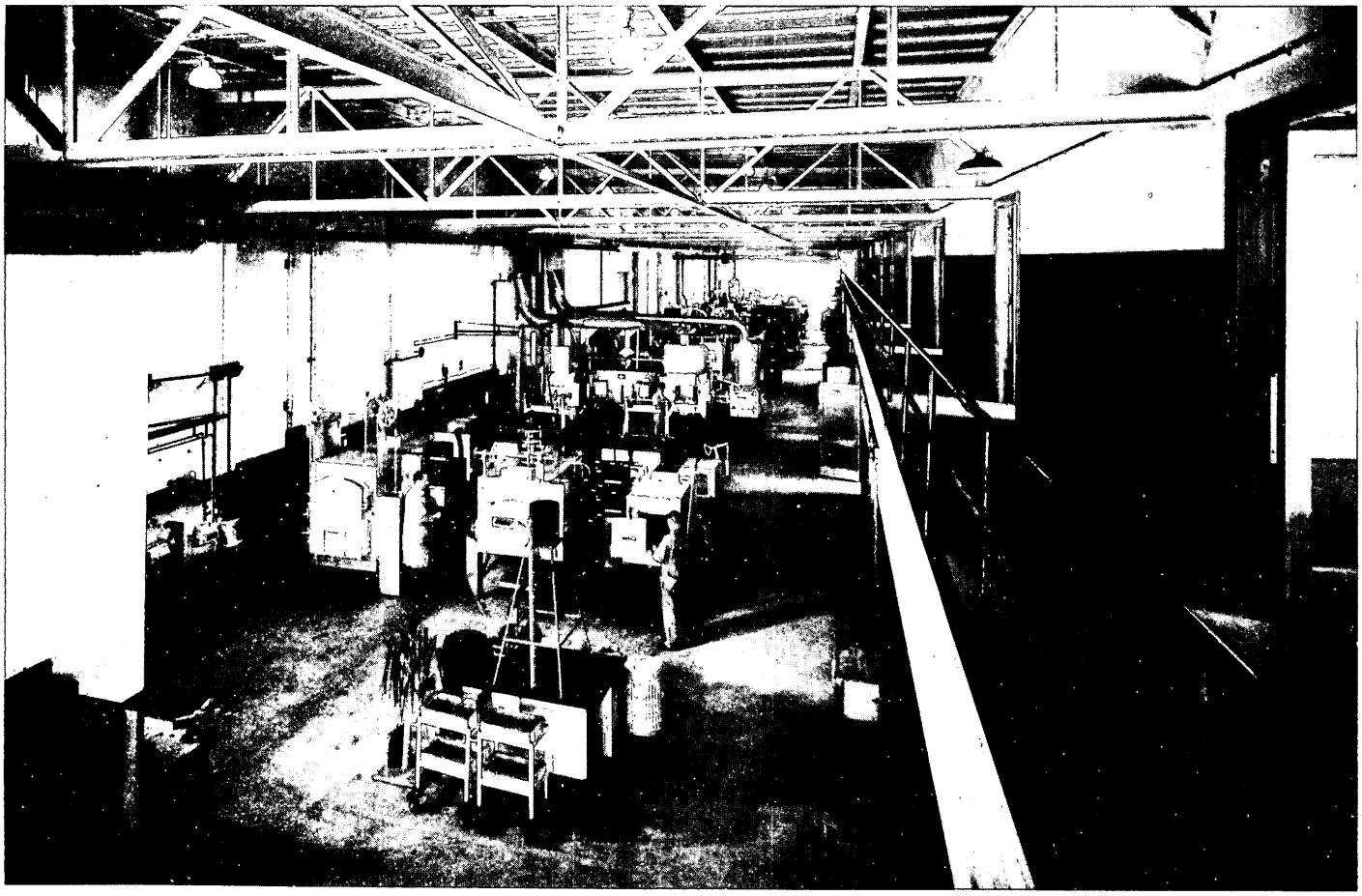


Figure 39 This photograph shows a section of the heat treating laboratory at Battelle. A portion of the Electrochemical laboratory can be seen in the back-ground.

BATTELLE INSTITUTE was founded by the will of Gordon Battelle as a memorial to the Battelle family. The Battelles were among the first settlers of Ohio, and were prominent in the development of the state's iron and steel industry.

Gordon Battelle, last of the family line, was impressed with the benefits to be derived from industrial research and left his estate for the building and endowment of an Institute "for the purpose of education . . . the encouragement of research . . . and the making of discoveries and inventions for industry." The Institute began operations in 1929.

As established, Battelle provides, on a not-for-profit basis, the physical plant, equipment, and personnel for conducting research. The great bulk of it is applied research conducted for industry and government.

In keeping with its educational function, the Institute also conducts fundamental or basic research. Much of this research is financed from the Institute's endowment, and the results are published for the general encouragement of science and industry, and to benefit the public welfare.

Fields of research at Battelle include agriculture and practically all the industrial and engineering sciences.

Armco
3052

FOR YOUR
INFORMATION

from

BATTELLE
MEMORIAL
INSTITUTE

505 KING AVENUE • COLUMBUS 1, OHIO

DMEA
FILE COPY
Surname:
DMEA

Martin
Dana
McCaley
Build
Tanner
Martin
Hollomon
Hodges
Selfridge
Williams
Wittenstein
3/3/54

UNITED STATES
DEPARTMENT OF THE INTERIOR
OFFICE OF THE SECRETARY
WASHINGTON 25, D. C.

3052

N.S. in R.R.

PRS 1714

MAR - 5 1954

Dear Bill:

Reference is made to my letter of October 30, 1953, regarding an earlier denial by the Defense Minerals Exploration Administration of an application for exploration assistance submitted by the Associated Red Flats Mining Group, our docket No. DMEA 3052 - Nickel. In that letter I told you that the Bureau of Mines was making preliminary metallurgical tests toward determining whether an economically possible treatment process for your ore could be developed, and I added that you would be informed of the results of our tests.

The Bureau of Mines has now reported that the sample tested responded to treatment very well in the preliminary tests, but the investigation was not extensive enough to use for the type of cost estimates that would be of greatest interest to anyone interested financially in your property: i.e., estimated smelting cost per pound of nickel produced; and estimated cost and capacity of the smallest plant installation to which such costs might apply. In the closely related question of minimum grade of ore to which such costs might apply, it was found to be doubtful that 0.74 percent nickel ore, the grade of the material found for use in our tests, is a commercial grade.

The metallurgical activities of the Bureau of Mines are limited to investigations of the technical sort already completed, and do not include the commercial type of testing which your property now seems to require. Such testing, therefore, could best be performed by consultants from private enterprise. Battelle Memorial Institute, 505 King Avenue, Columbus, Ohio, is, for example, well qualified.

Mr. S. M. Shelton, Regional Director, Region II, U. S. Bureau of Mines, P. O. Box 492, Albany, Oregon (Telephone: Albany 2000) reports further that if you would like

to visit our laboratory there and discuss with him the feasibility of smelting Red Flats nickel ore, you would be welcome to do so. This looks to me like a practical suggestion.

If there is anything else I can do, let me know.

With kind personal regards.

Sincerely yours,

(Sgd) Doug

Secretary of the Interior

Mr. William E. Walsh
Suite 201, American Building
Coos Bay, Oregon

Copy to: Secretary's Mails & Files
Secretary's Reading File
Asst. Secretary for Mineral Resources (2)
Mr. Imhoff

DMEA Docket 30524
DMEA Adm. Read. File
Field Team, DMEA Region 2
DMEA Code 400

J. J. Forbes, US Bur. Mines
M. W. Davis, US Bur. Mines
Phillip Guild, US Geol. Survey

WSMartin/ls
3/2/54

Dome 3052 Docket

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF MINES
WASHINGTON 25, D. C.

RECEIVED
FEB 19 1954

February 18, 1954

Memorandum

To: W. S. Martin, Defense Minerals Exploration Administration

From: H. W. Davis, Bureau of Mines

WSM

Subject: Metallurgical results of treating Red Flat ore

S. M. Shelton, Regional Director, Region II, in response to the Director's memorandum of February 4, has replied as follows:

"A 14.8 ton sample of Red Flat ore was smelted in a continuous test in a 3-phase electric arc smelting furnace. This sample analyzed 0.74 percent nickel. No fluxing materials were used and the only reductant used in the furnace charge was hogged fuel. The furnace was lined with magnesite refractories.

"Technically, the results of the tests were quite satisfactory. One thousand, four hundred-forty-four pounds of low-carbon ferronickel was recovered which analyzed from 9.39 to 14 percent Ni, and from 84.5 to 86.8 percent Fe. Eighty-two percent of the nickel charged to the furnace was recovered.

"The power consumption, per pound of nickel contained in the ferronickel product was 88.1 kw.-hr., and the electrode consumption was 0.87 pound. Larger scale smelting operations would cut down somewhat on the power and electrode consumption."

Mr. Shelton states that although this ore responded to treatment very well in these preliminary smelting tests, the investigation was not extensive enough to give definite answers to your specific questions concerning (1) estimated smelting cost per pound of nickel produced, (2) estimated cost and capacity of the smallest plant installation to which such costs might apply, and (3) estimated minimum grade of ore to which such costs might apply. According to Shelton, it is doubtful if 0.74 percent nickel ore is a commercial grade. It is understood that Hanna Smelting Co. plans to smelt ore of considerably higher grade.

The final two paragraphs of Mr. Shelton's memorandum read as follows:

Copy retained

"The Government may be justified in continuing investigations on the Red Flat nickel deposit. Analysis of samples from diamond drill holes indicated that some of the holes did not bottom the ore deposit. Larger reserves of nickel may be present than has been indicated by the drilling program completed. Continued metallurgical investigations may also be warranted as higher grade head samples may be obtained with a consequent higher recovery of nickel. It may be possible also to recover the iron from the slag which contained about 35 percent iron, however, funds alloted to Region II, for fiscal 1954, for conducting this work have practically been depleted.

"If Mr. Walsh would like to visit our laboratory and discuss the feasibility of smelting Red Flat nickel ore, he would be welcome to do so."

H. W. Davis

H. W. Davis

Martin
Davis
Mikadoff

February 2, 1954

MEMORANDUM

To: Mr. Paul Zinner, Chief
Mining Division, Bureau of Mines

From: W. S. Martin, Chief
Iron and Ferro-Alloys Division, DMEA

Subject: Correspondence concerning Red Flats nickel deposits, Curry County, Oregon (DMEA Docket 3052 - Nickel)

Reference is made to letters concerning the subject nickel deposit, from Secretary McKay to Mr. William E. Walsh, Coos Bay, Oregon, dated:

July 7, 1953 (PRS 1339)
July 31, 1953 (PRS 1714)
September 2, 1953 (PRS 1714)
October 10, 1953 (PRS 1714)
October 30, 1953 (PRS 1714).

The last paragraph of the latest of the above-itemized letters reads as follows:

> "I can tell you that we are continuing our efforts to determine whether an economically possible treatment process can be developed for your ore. The Bureau of Mines has arranged to make preliminary metallurgical tests on a sample weighing several tons. The results of our tests should be available in three or four months, and such results are expected to demonstrate whether the Government would be justified in conducting further tests on a larger scale. You will, of course, be informed when our tests are concluded, however favorable or unfavorable the results may be."

It will, therefore, be much appreciated if you will obtain for us such data and recommendations as will enable us to prepare in the near future a letter giving Mr. Walsh the information promised him as quoted above.

On the basis of the brief reports available here, Mr. Hubert W. Davis informs us that the "preliminary metallurgical tests" mentioned above have recently been completed, indicating to your research staff that the ore from Red Flats can be smelted in the same manner as that developed for smelting the

2-3-54

ore from the Riddle deposit. Apparently, however, the method used for your tests was a laboratory process developed by the Bureau of Mines and differs in at least two important respects from the operating process now being used by the Hanna Smelting Company on Riddle ore. We understand also that no further smelting test work is scheduled on Red Flats nickel ore.

In any event you will probably agree that Mr. Walsh should not be advised that Red Flats ore can be smelted by the Bureau of Mines' process unless we can give him at the same time: (1) estimated smelting cost per pound of nickel so produced; (2) estimated cost and capacity of the smallest smelting plant installation to which such costs might apply; and (3) estimated minimum grade of ore to which such costs might apply.

SIGNED

W. S. Martin, Chief
Iron and Ferro-Alloys Division

Copy to: Mr. H. W. Davis, USBM

CC: DOCKET
CODE 400
ADM. READ. FILE

WSMartin/ls

UNITED STATES
DEPARTMENT OF THE INTERIOR
OFFICE OF THE SECRETARY
WASHINGTON 25, D. C.

FILE COPY
Surname:
DMEA

Rutledge
Martin
Spence
Hayes
Fedors
Seelbridge
E. J. Burke

10/22

PRS # 1714

N.S. in R.R.

OCT 30 [redacted]

2d page rewrtn 10-29, Off. of Asst. Sec. Min. Res.

Dear Bill:

Reference is made to your letter of August 18, 1953, regarding the denial of an application for exploration assistance submitted by the Associated Red Flats Mining Group, our docket No. DMEA 3052 - Nickel. My letters of September 2 and October 10, 1953, advised you that your letter had been referred to the Defense Minerals Exploration Administration for further review and comments, especially with regard to the metallurgical questions you raised.

The Defense Minerals Exploration Administration has discussed your proposed project informally with the appropriate commodity specialists of the Materials Division, Emergency Procurement Service, General Services Administration. That Division is concerned with acquiring strategic materials for the National Stockpile, and therefore keeps in close touch with the Office of Defense Mobilization, whose function it is to set the stockpiling goals. While these goals are confidential, I can assure you that material of the Red Flats type, assaying approximately 1.1 percent nickel as silicate, is not presently under active consideration by the Government as an ore of nickel. To be a source of nickel, the material must be amenable to a metallurgical treatment process that will extract nickel at a cost not out of all reason under the circumstances that might be anticipated, even though that cost may well be unprofitable in ordinary times.

Your letter of August 18 advised that one of the engineers from the Cuban nickel operations has reported to your people that the same process that is used in Cuba could be used effectively on the Red Flats ore. It is not always safe to reason by analogy in metallurgical problems, and our information does not indicate that the available methods and processes would extract nickel from silicates as low grade as yours effectively enough to justify Government participation in a search for more material of similar characteristics.

You also refer to the "Materials Survey - Nickel" (published by the U. S. Bureau of Mines on May 15, 1953) and suggest, by what we believe to be a mistaken analogy with the description therein of the nickel occurrences in New Caledonia, that higher nickel grades could be expected in lower portions of your property. Our geologists have done enough work on lateritic deposits in southwestern Oregon to satisfy us that higher nickel concentrations are found there in upland or bench deposits rather than at the base of steep slopes. Similarly your comment on the need for stripping

overburden in Cuba and the absence of overburden at Red Flats seems to be based on a misapprehension of the mining problem involved. The suggestion that the other strategic minerals you named are present in significant amounts is contrary to the results of our experience.

The conclusion of your letter urges that some effort be made to determine or explore the Red Flats area. Whenever, as in this instance, an exploration application has been denied because the metallurgical problem is still unsolved, the applicant must bear the burden of proof that his ore is readily amenable to treatment. If you have doubts about the reliability of our metallurgical data, you could ask the Battelle Memorial Institute, 505 King Avenue, Columbus 1, Ohio, or some equally well recognized engineers, to investigate your treatment problem.

I can tell you that we are continuing our efforts to determine whether an economically possible treatment process can be developed for your ore. The Bureau of Mines has arranged to make preliminary metallurgical tests on a sample weighing several tons. The results of our tests should be available in three or four months, and such results are expected to demonstrate whether the Government would be justified in conducting further tests on a larger scale. You will, of course, be informed when our tests are concluded, however favorable or unfavorable the results may be.

Sincerely yours,

(sgd) Doug

Secretary of the Interior

Mr. William H. Walsh
Suite 201 American Building
Coos Bay, Oregon

WSMartin/ls
10/22/53

Copy to: Secretary's Mails & Files
Secretary's Reading File
Asst. Secretary for Mineral Resources
Mr. Imhoff

DMEA Docket 3052
DMEA Adm. Read. File
Field Team, DMEA Region 2
DMEA Code 400

J. J. Forbes, US Bur. Mines
A. L. Davis, US Bur. Mines
Phillip Guild, US Geol. Survey

File in Docket

FILE COPY
Surname:
DMEA

Rutledge
Martin
Davis
Lindley
Thayer

10/15

UNITED STATES
DEPARTMENT OF THE INTERIOR
OFFICE OF THE SECRETARY
WASHINGTON 25, D. C.

PRS # 1714

Dear Bill:

Reference is made to your letter of August 18, 1953, regarding denial of an application for exploration assistance submitted by the Associated Red Flats Mining Group, our docket No. DMEA 3052 - Nickel. My letters of September 2 and October 10, 1953, advised you that your letter had been referred to the Defense Minerals Exploration Administration for further review and comments, especially with regard to the metallurgical questions you raised.

The Defense Minerals Exploration Administration has discussed your proposed project informally with the appropriate commodity specialists of the Materials Division, Emergency Procurement Service, General Services Administration. That Division is concerned with acquiring strategic materials for the National Stockpile, and, therefore, keeps in close touch with the Office of Defense Mangagement, whose function it is to set the stockpiling goals. While these goals are confidential, I can assure you that material of the Red Flats type, assaying approximately 1.1 percent nickel as silicate, is not presently under active consideration by the Government as an ore of nickel.

Under normal conditions an ore is a material from which a metal can be extracted profitably. Under the conditions of the Defense Program, an ore is any "source" of a metal. To be a source of nickel, the material must be amenable to some treatment process that will extract nickel at a cost not out of all reason under the circumstances that might be anticipated, even though that cost may well be unprofitable in ordinary times.

Your letter of August 18 advised that one of the engineers from the Cuban nickel operations has reported to your people on location about the ease of handling your ore. I am surprised that you did not take this opportunity to comply with the request in my letter of July 31, 1953, to send me a copy of any report you may have on test work indicating that the same process that is used in Cuba could be used effectively on the Red Flats ore. Our information does not indicate that the available methods and processes would extract nickel from silicates as low grade as yours effectively enough to justify Government participation in a search for more material of similar characteristics.

You also refer to the "Materials Survey - Nickel" (published by the U. S. Bureau of Mines on May 15, 1953) and suggest, by analogy with the description therein of the nickel occurrences in New Caledonia, that higher nickel grades could be expected in lower portions of your property. Our geologists have done enough work to satisfy us that, as lateritization has operated in southwestern Oregon, higher nickel concentrations are to be expected in upland or bench deposits rather than at the base of steep slopes.

What you say about the need for stripping overburden in Cuba and the absence of overburden at Red Flats seems to be based on a misapprehension of the mining problem involved. The term "overburden" is the technical name for material that cannot be profitably treated but must be removed in order to mine the "ore" that is found underneath that overburden. At Red Flats, so long as there is no material that can properly be called ore, there is no overburden, but whenever a suitable treatment process can be developed, the higher grade portions of the nickel-bearing material there will then become ore, and whatever lower grade or barren material is found above such ore will then become overburden.

Any suggestion that the other strategic minerals you named are present in significant amounts does not accord with our findings. The Defense Minerals Exploration Administration has at no time been authorized to aid exploration for magnesium; cannot assist in the search for aluminum occurring otherwise than as bauxite; as of May 15, 1953, is precluded from participation in exploration for iron, sulphur, or mercury; and would not be justified in basing a chrome project on the analyses reported for Red Flats material in the publications of the Oregon State Department of Geology and Mineral Industries.

The conclusion of your letter urges that some effort be made to determine or explore the Red Flats area. It appears that the essential problem in this case is to determine whether an economically possible treatment process can be developed for your ore. For your personal information, but not for publication, I am pleased to inform you that the Bureau of Mines has arranged to make preliminary metallurgical tests on a sample weighing several tons. Such tests, the results of which are expected to be available in three or four months, will demonstrate whether the Government would be justified in conducting further tests, perhaps on a larger scale.

You will, of course, be informed promptly whether the test results are favorable or not.

Sincerely yours,

Secretary of the Interior

Mr. William E. Walsh
Suite 201 American Building
Coos Bay, Oregon

Copy to: Secretary's Mail & Files
Secretary's Reading File
Asst. Secretary for Mineral Resources
Mr. Imhoff

DMEA Docket 3052 C
DMEA Adm. Read. File
Field Team, DMEA Region 2
DMEA Code 400

Mr. J. J. Forbes, Bur. Mines
Mr. H. W. Davis, Bur. Mines
Mr. Phillip Guild, Geol. Survey

Not Sent

WSMartin/ls
10/15/53

400

JB

FILE COPY
SURNAME:

Martin

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS ADMINISTRATION
WASHINGTON 25, D. C.

N. S. in R.R.

October 15, 1953

MEMORANDUM

To: Mr. Paul Zinner, Chief
Mining Division, Bureau of Mines

From: W. S. Martin, Chief
Iron and Ferro-Alloys Division, DMEA

Subject: Correspondence concerning Red Flats nickel deposits, Curry County, Oregon (DMEA Docket 3052 - nickel)

Correspondence as itemized below is returned herewith for your files. Your lending it to this office for review in connection with consideration of an application submitted by the Associated Red Flats Mining Group for exploration assistance, is appreciated.

(1) Memorandum of July 30, 1953, to Paul Zinner from Wing G. Agnew, transmitting 2 reports from the Mt. Weather Technical Files pertaining to nickel occurrences in southwestern Oregon.

(2) Three maps:
Fig. 1 - Location of Red Flats, Curry County, Oregon
Fig. 4 - Topography and drill holes, Red Flats, Curry County, Oregon
Fig. 5 - Cross section showing ore horizons--Red Flat, Curry County, Oregon

(3) Memorandum of August 11, 1953, to Paul Zinner from Stephen M. Shelton, Regional Director, Bureau of Mines, Albany, Oregon, transmitting report "Red Flats Nickel Deposit" by J. R. McWilliams, and requesting permission to release a copy to Mrs. Agnes Smedley, Gold Beach, Oregon, one of the owners of claims investigated by Bureau of Mines.

(4) Memorandum of August 26, 1953, to Stephen M. Shelton from Paul Zinner, returning two copies of manuscript on "Red Flats Nickel Deposit" without approving same for publication and forbidding release of copy to Mrs. Agnes Smedley since report contains interpretation of data on ore reserves.

Copy to: Mails & Files
Code 400
Adm. Read. File

W. S. Martin, Chief
Iron and Ferro-Alloys Division

Attachments

LScott/10/15/53

FILE COPY
Surname:
D.M.E.A.

Martin
Fo Johnson

UNITED STATES
DEPARTMENT OF THE INTERIOR
OFFICE OF THE SECRETARY
WASHINGTON 25, D. C.

P.R.S. # 1714

Dear Bill:

My letter of September 2, 1953, advised you that I had referred to the Defense Minerals Exploration Administration, for further review, your letter of August 18, 1953, regarding denial of an application for exploration assistance submitted by the Associated Red Flats Mining Group, our docket No. DMEA 3052-Nickel.

Your letter raises a number of metallurgical questions that are now being investigated and answers, or at least partial answers, to those questions should soon be available. In the meantime your problem is not being neglected and you can expect to hear further from me on the subject in the near future.

Sincerely yours,

Oscar Ewing

Secretary of the Interior

Mr. William E. Welsh
Suite 201 American Building
Coos Bay, Oregon

Copy to: Field Team, DMEA Region 2
J. J. Forbes, Bur. of Mines
Docket DMEA 3052
DMEA Adm. Read. File
Code 400
H. W. Davis, USBM
Phillip Guild, USGS
Secretary's Reading File
Asst. Secretary for Mineral Resources
Mr. Imhoff

WsMartin/ls
10/6/53

R.C.B.
10-13-53

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Region II

Albany, Oregon
October 7, 1953

Memorandum

To: J. J. Forbes, Director

From: Regional Director, Region II

Subject: Metallurgy of Red Flats, Oregon Nickel Silicates

Reference is made to your memorandum of September 18 concerning comments on Red Flats nickel ore for Mr. Martin of D.M.E.A. Comments on the requested items are tabulated as follows:

(1) The chief similarities between Red Flats, Riddle and Nicaro are that they are low grade silicate deposits. Nicaro and Red Flats are lateritic deposits underlain with serpentine, but at Riddle the laterite is largely removed, leaving an altered serpentine. Nicaro laterite is high in iron, permitting a treatment feed material in excess of 35 percent iron. The Riddle deposit is much lower in iron. The iron content of Red Flats is yet to be determined. A large amount of metallurgical research has been done on both Nicaro and Riddle ore samples. Essentially no information on metallurgical treatment of Red Flats is available.

(2) There is reason to believe that high iron deposits such as Nicaro are more readily amenable to the leaching method and lower iron deposits such as Riddle more adaptable to smelting because less selective reduction of nickel from iron would be required to obtain a reasonable high nickel ferro alloy. However, we have no record of direct technical or economic comparisons of processes for either Riddle or Nicaro.

(3) Until analyses for iron and other possible components of Red Flats have been obtained, it is difficult to comment on the details of Mr. McWilliams' conclusion that "It is probable that Red Flats ore will be amenable to the same process." However, our test experience with Cle Elum iron-nickel ore - high in iron and Riddle ore - low in iron - indicates that no insurmountable technical problems would be expected in the smelting of Red Flats ore even if the iron value is high.

(4) It would be necessary to test the Red Flats ore to determine whether or not it would be amenable to the Nicaro process. It is my understanding that a careful balance of iron and nickel values, roasting temperatures and leaching conditions are necessary for economical leaching of Nicaro ores.

(5) The clipping from the Oregonian of Friday, September 5, 1952 mentioned a process using Riddle ore. There are no available test results that would indicate whether the Red Flats ore is amenable to the Bureau process. Incidentally, I disclaim responsibility for certain statements in the newspaper article such as, "---but surface deposits were said to have a 1.5 percent nickel content", "---November might see tentative reports ready for release", and "---belief that proving of an appreciable reserve of nickel in the Red Flats area could be expected to bring the same type of development that is planned for Nickel mountain (Riddle) ---."

The distinction between the "Bureau Process" and the "Riddle Process" is that in the Bureau process, nickel in the ore is reduced to metal by carbon in a continuous electric smelting furnace. It is my understanding that the Ugene process, to be used by the Hanna Smelting Company at Riddle, is a batch process, ferrosilicon will be added to molten ore in a special furnace to reduce the nickel to metal. Low carbon ferronickel metal is produced by both processes.

Stephen M. Shelton

Director's Reading File
Mf
Rf
LHB

COPY

October 10, 1953

P.R.S. #1714

Dear Bill:

My letter of September 2, 1953, advised you that I had referred to the Defense Minerals Exploration Administration, for further review, your letter of August 18, 1953, regarding denial of an application for exploration assistance submitted by the Associated Red Flats Mining Group, our docket No. DMEA 3052 - Nickel.

Your letter raises a number of metallurgical questions that are now being investigated and answers, or at least partial answers, to those questions should soon be available. In the meantime your problem is not being neglected and you can expect to hear further from me on the subject in the near future.

Sincerely yours,

SIGNED

Secretary of the Interior

Mr. William E. Walsh
Suite 201 American Building
Coos Bay, Oregon

Copy to: Field Team, DMEA Region 2
J. J. Forbes, Bur. of Mines
Docket DMEA 3052
DMEA Adm. Read. File
Code 400
H. W. Davis, USBM
Phillip Guild, USGS

Secretary's Reading File
Asst. Secretary for Mineral Resources
Mr. Imhoff

WSMartin/ls
10/6/52

OFFICE OF THE DIRECTOR

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF MINES
WASHINGTON 25, D. C.

September 18, 1953

Memorandum

To: Regional Director, Region II

From: Director

Subject: Metallurgy of Red Flats, Oregon, Nickel Silicates

In an exchange of letters between Secretary McKay and William H. Walsh of Associated Red Flats Mining Group concerning the denial by DMEA of an application for exploration assistance (Docket No. DMEA 3052 - Nickel), Mr. Walsh has suggested that the Red Flats ore is similar to that of Riddle and Nicaro, and has stated that he believes that the process developed for Riddle ore or the process now used on Nicaro ore could be used on Red Flats ore. To aid DMEA in preparing a letter for Secretary McKay to send to Mr. Walsh, Mr. Martin of DMEA would like to have your comments on the following items:

(1) Please tabulate the chief similarities and differences between Red Flats, Riddle, and Nicaro ores.

(2) To what extent, if any, are the processes now in use on the Riddle and Nicaro ores interchangeable without sacrifice of recovery?

(3) Mr. John R. McWilliams' report, covered by your memorandum to Mr. Paul Zinner, dated August 11, 1953, states that no metallurgical tests have been made on Red Flats ore. Is Red Flats ore sufficiently like Riddle ore to support Mr. McWilliams' conclusion that "it is probable that Red Flats ore will be amenable to the same process"?

(4) Is Red Flats ore sufficiently like Nicaro ore to suggest that it would be amenable to the Nicaro process?

HWDavis:cb

Copy to: Ferrous Metals
W. S. Martin, DMEA
H. W. Davis
P. Zinner
Director's Reading File
Files

(5). Enclosed is copy of a clipping from the Oregonian of Friday, September 5, 1952, mentioning a process developed by the Bureau of Mines, presumably using Riddle ore. Are there any available test results that would indicate whether the Red Flats ore is amenable to the Bureau process?

It will help us if you will reply at your early convenience to as much of the above as can be answered on the basis of information already available to you, supporting your conclusions wherever possible by references to the results of tests. You can readily understand, however, that in the absence of sufficient information, your best estimate or the estimates of those of your staff who have been closest to the problem, provided those estimates are clearly expressed as such, will also be of assistance to us and will be appreciated by DMEA.

J. J. FORBES

Director

Enclosure

FILE COPY
Surname:
DMEA

UNITED STATES
DEPARTMENT OF THE INTERIOR
OFFICE OF THE SECRETARY
WASHINGTON 25, D. C.

SEP - 2 1953

P. R. S. No. 1714

Dear Bill:

This will acknowledge receipt of your letter of August 18, 1953, discussing my letter of July 31, 1953, with reference to the denial of an application for exploration assistance submitted by the Associated Red Flats Mining Group, our docket No. DMEA 3052 - Nickel.

I am referring your letter to the Defense Minerals Exploration Administration for further review. Upon receipt of their comments on the points raised in your letter, I will answer you in detail.

Sincerely yours,

(sgd) Doug

Secretary of the Interior

Mr. William E. Walsh
Suite 201 American Building
Coos Bay, Oregon

FARutledge/ls
8/27/53

Copy to: Docket DMEA 3052
Adm. Reading File
Field Team, Region 2
Code 400, DMEA
H. W. Davis, USBM
Phillip Guild, USGS
Mr. Imhoff
Secretary's Reading File
Asst. Sec'y for Mineral Resources

DENIED

R.C.H.
8-31-53

Dmea Docket File

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WILLIAM E. WALSH
Law Offices
Suite 201 American Building
Coos Bay, Oregon
August 18, 1953.

Honorable Douglas McKay
Secretary of the Interior
Washington 25, D. C.

In re: Red Flats Mining Group

Dear Doug:

I had contemplated answering your letter of July 31 at a sooner date but have been so tied up on these fire cases that I haven't had a chance to go over the situation. I am leaving today and will be gone about a week or ten days, so I am almost as bad off now as I was before. In any event, however, I did want to make some comments about what was in your letter.

I am informed from the people on location that one of the engineers from the Cuba nickel operation has also been on the Curry County operation, and that they inform us that the same type of ore is in both places, except that the Curry County ore has less iron content which should make it easier to handle, if anything.

I notice in your Materials Survey on nickel under date of April, 1952, on page I-14 that in Cuba they use the ammonia leaching process. It would seem to me that such a process could be used on the Curry County operation. Irrespective of what someone might say in the Bureau of Mines, only 200 acres of the 4,000 acres were tested and it was not at the lower portions of the property where you could normally expect a better result. In Cuba they have a considerable over-burden to strip while in the Curry County operation there is practically little or no over-burden. As shown in the Materials Survey which I quoted from before, on page IV-12, in the paragraph immediately preceding the last three lines it refers to the ore in New Caledonia and how the steep slopes have little or no nickel but at the base they found considerable deposits. I do not believe there is any question but what the percentage would be raised considerably in any tests that were taken in the lower portions of the Curry County property.

Speaking of the last paragraph of your letter, that there is no evidence of other strategic minerals, this is contrary to the tests made by the State of Oregon in which they found considerable amounts of other strategic minerals. These findings are certainly available to the Bureau of Mines and if they do not know about them it is because they have not asked. The Red Flats Mining Group has had private tests made as well

as the tests made by the State and it has been determined that there was enough magnesium, aluminum, iron, chromium, sulphur and mercury to justify their consideration.

The Red Flats Area containing such a large ore body compared to any other area having nickel in this part of the country, it would seem to me that it certainly justifies some effort being made to determine or explore the project to a far greater extent than has been done.

With best regards, I remain

Sincerely yours,

Sgd. Wm. E. Walsh

WM. E. WALSH

WEW:jj

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THE SECRETARY OF THE INTERIOR

WASHINGTON

July 31, 1953

Dear Bill:

This will acknowledge receipt of your letter of July 22, 1953, commenting on the merits of the Red Flats and other claims in Curry County, Oregon.

Your office had forwarded to Defense Minerals Exploration Administration the application of the owner, Associated Red Flats Mining Group, for aid in financing an exploration project on those claims, and that application (filed here under Docket No. DMEA 3052 - Nickel) had been denied, as you were advised in my letter of July 7.

I would very much appreciate receiving a copy of any report you may have on test work indicating that the same process that is used in Cuba could be used effectively on the Red Flats ore. With your permission, such metallurgical data would also be transmitted to other Government agencies, more directly concerned with production problems, that ought to be advised immediately if there is there is good reason to anticipate a successful application of any existing process to nickel silicate mineralization of such low grade.

You are correct in your inference that Defense Minerals Exploration Administration based its conclusion about the nickel grade at Red Flats on the report of the U. S. Bureau of Mines. The property was churn drilled by the Bureau in the summer of 1952 in connection with a cooperative program financed in part by the California-Oregon Power Company, and permission from that company had to be obtained before the advance report could be furnished to your associates. Your suggestion that the Bureau drilled the ground which would be least likely to show good results in nickel content is contrary to our information. Records here show the area drilled was the most favorable, as indicated by earlier examinations by the Bureau, the Oregon State Department of Geology and Mineral Industries, and several private interests.

The Bureau work indicated over 4 million tons of nickel-bearing laterite in the area drilled, averaging 1.1 percent nickel. However, metallurgical tests conducted by the Bureau of Mines at Albany, Oregon, failed to develop an economically feasible process for recovery of the nickel from this ore. Unless and until such a process is found, there appears to be little justification for further exploration to develop additional reserves. This, I understand, was the basis for denial by DMEA of your application for exploration assistance.

You can be sure that the Interior Department, so long as I speak for it, is not interested in aiding or abetting any monopoly; I believe strongly in competitive free enterprise. If your associates chose not to lease their claims to the M. A. Hanna Company, or if the owners of a nickel deposit in Josephine County chose to lease to that company, this Department would have no authority to intervene in any way.

Your belief that nickel is a strategic metal is correct. I have not, however, been able to confirm your statement "that the ore in the Red Flats area has considerable other strategic minerals in it," and have seen no evidence to justify the applicant's intention to explore for "cobalt, platinum, tin and other strategic* metal in almost any ordinary rock specimen, but unless such elements are present in significant proportions that can be determined readily by conventional wet or dry assaying methods, serious consideration cannot be given to such trace elements as sources of the metals we need for the National Defense Program.

Sincerely yours,

(sgd) Douglas McKay

Secretary of the Interior

Mr. William E. Walsh
Suite 201 American Building
Coos Bay, Oregon

AP:jr

*(Note: Apparently in typing letter in Secretary's office from draft submitted by DMEA, an omission occurred in last paragraph, line 5, after word "strategic". It should read:

to explore for "cobalt, platinum, tin and other strategic (minerals" in addition to nickel in that area. As you probably know, an experienced man with a spectrograph can frequently find traces of more than one strategic) metal in almost any ordinary rock specimen, ...)

C
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P
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WILLIAM E. WALSH
Law Offices
Suite 201 American Building
Coos Bay, Oregon

(1714
Interior Dept.
Received
JUL 24, 1953
Office of the
Secretary)

July 22, 1953

Personal

Honorable Douglas McKay
Secretary of the Interior
Washington 25, D. C.

Dear Doug:

I received your letter of July 7 regarding the Associated Red Flats Mining Group application under Docket No. DMEA 3052-Nickel. I guess my previous letter had crossed in the mail with yours.

I notice what you say regarding the Red Flats grade of nickel being less than the ore of Nickel Mountain being processed by the Hanna Company. Actually, however, from my study of the nickel situation in the country, nickel of 1.11 is a very good ore so far as the content is concerned. The ore in Red Flats is an oxide, the same as the Cuban ore, and while the Hanna process wouldn't probably work on the Red Flats ore, from what I am informed the same process that is used in Cuba could be used on the Red Flats ore.

Presumably Mr. Mittendorf, the Administrator of the Defense Minerals Exploration Administration, got his information regarding the Red Flats nickel from the Bureau of Mines. Actually I am informed from the people that were on the ground that when the Bureau of Mines did their borings and testing in the Red Flats area they actually only bored on 200 acres of the 4,000 acre tract and their work was all immediately about their camp on higher ground, which would be least liable to show good results in nickel content. They never even walked over the balance of the country. They promised the owners of the deposit to get a report out to them by last November, but only a couple of months ago was there an advance report made which is incomplete and that was only procured after a great deal of pressure being brought.

The Hanna Company have endeavored to lease the property of the Red Flats Mining Group, but at the time they attempted to do this there were so many parties involved that no satisfactory arrangement could be worked out. Since that time the Hanna Company has tied up a considerable nickel deposit in Josephine County as well as Nickel Mountain in Douglas County. It would seem that they are interested in dominating the field as much as possible. Having had experience in the past with a similar situation, this case has all the earmarks of a monopoly aided and abetted by a departmental help.

I believe if nickel is the strategic metal that it appears to be from the listing of such metals and with the further consideration of the fact that the ore in the Red Flats area has considerable other strategic minerals in it, that this area should be given some definite consideration, and I do not believe that that has been forthcoming. There are a large number of people interested in the Red Flats area in Curry County and it's not a pipe dream. If there is any way that you can help in giving this matter a fair test I would surely appreciate it.

I noticed your postscript on your letter saying you would like to see me when possible. I had hoped that I was going to have a chance to talk with you when you were out here last time, but certain matters came up that blocked me off from getting to the Detroit Dam where I expected to have a chance to see you. I don't at present see any opportunity of my getting to Washington in the immediate future, but if you are going to be out this way in the next couple of months I will certainly make it a point to get together with you. I would not only like to visit with you as always, but I am somewhat disturbed about certain administration policies so far as they effect the economic and political situation in the Northwest, and I certainly would like to discuss these matters with you.

I want to compliment you on the job you are doing. You certainly picked one of the most difficult ones for yourself that I can imagine. Sure wish you the best in your endeavors and hope to see you before too long.

With best regards, I remain

Sincerely,

Signed: Bill

WEW:jj

Surnamed by:

IMHOFF
WORMSER
McCRILLIS

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DEPARTMENT OF THE INTERIOR

OFFICE OF THE SECRETARY

WASHINGTON 25, D. C.

July 22, 1953

Dear Bill:

I have your letter of July 10, and again our letters have crossed in the mail. By this time I am sure you have received my letter of July 7 which I am sure explains our position in regard to the Associated Red Flats Mining Company application.

If there is anything else I can do, let me know.

With kind personal regards.

Sincerely yours,

Sgd: DOUG

Secretary of the Interior

Mr. William E. Walsh
Suite 201, American Building
Coos Bay, Oregon

OBrown/b
cc: Secretary's Reading File
Sec. Wormser

C
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WILLIAM E. WALSH
Law Offices
Suite 201 American Building
Coos Bay, Oregon

July 10, 1953

Honorable Douglas McKay
Secretary
Department of the Interior
Washington, D. C.

Dear Doug:

On the 22nd of June I wrote you regarding the application of the Associated Red Flats Mining Group of Gold Beach, Oregon, regarding a loan under DMEA Order No. 1 covering a nickel deposit in Curry County. I realize that you have a tremendous volume of things to do and I didn't expect you personally to look into this matter. However, I have not heard from your office and I am wondering if you know anything about the situation.

Since writing you we got a letter from one of the Washington offices turning down the loan on the basis that the property in question does not show sufficient merit. The Bureau of Mines investigated a portion of the property but the only thing we can get out of them is the fact that they haven't got their report in as yet. With some competitors in the field on nickel deposits I am very suspicious of the action taken without even a report being made as to the findings of the Bureau of Mines. It looks to me like the chrome situation looked during the war when we were dealing with the Minerals Division of the War Production Board and had to make our request from dollar-a-year men who were down at Washington, so-called representing the government, but actually on the payroll of people competing in the field of chrome ore.

If there is any help you can give us on this matter I certainly would appreciate it. With best regards, I remain

Sincerely yours,

Signed: Bill

WM. E. WALSH

WEW:jj

COPY

final draft sent Mr Schoff on 7/29/53

Dear Bill:

This will acknowledge receipt of your letter of July 22, 1953, commenting on the merits of the Red Flats and other claims in Curry County, Oregon.

Your office has forwarded to Defense Minerals Exploration Administration the application of the owner, Associated Red Flats Mining Group, for aid in financing an exploration project on those claims, and that application (filed here under Docket No. DMEA 3052 - Nickel) had been denied, as you were advised in my letter of July 7.

I would very much appreciate receiving a copy of any report you may have on test work indicating that the same process that is used in Cuba could be used effectively on the Red Flats ore. With your permission, such metallurgical data would also be transmitted to other Government agencies, more directly concerned with production problems, that ought to be advised immediately if there is good reason to anticipate a successful application of any existing process to nickel silicate mineralization of such low grade.

You are correct in your inference that Defense Minerals Exploration Administration based its conclusion about the nickel grade at Red Flats on the report of the U. S. Bureau of Mines. The property was churn drilled by the Bureau in the summer of 1952 in connection with a cooperative program financed in part by the California-Pregon Power Company, and permission from that company had to be obtained before the advance report could be furnished to your associates. Your suggestion that the Bureau drilled the ground which would be least likely to show good results in nickel content is contrary to our information. Records here show the area drilled was the most favorable, as indicated by earlier examinations by the Bureau, the Oregon State Department of Geology and Mineral Industries, and several private interests.

The Bureau work indicated over 4 million tons of nickel-bearing laterite in the area drilled, averaging 1.1 percent nickel. However, metallurgical tests conducted by the Bureau of Mines at Albany, Oregon, failed to develop an economically feasible process for recovery of the nickel from this ore. Unless and until such a process is found, there appears to be little justification for further exploration to develop additional reserves. This, I understand, was the basis for denial by DMEA of your application for exploration assistance.

You can be sure that the Interior Department, so long as I speak for it, is not interested in aiding or abetting any monopoly; I believe strongly in competitive free enterprise. If your associates chose not to lease their claims to the M. A. Hanna Company, or if the owners of a nickel deposit in Josephine County chose to lease to that company, this Department would have no authority to intervene in any way.

Your belief that nickel is a strategic metal is correct. I have not, however, been able to confirm your statement "that the ore in the Red Flats area has considerable other strategic minerals in it," and have seen no evidence to justify the applicant's intention to explore for "cobalt, platinum, tin and other strategic minerals" in addition to nickel in that area. As you probably know, an experienced man with a spectrograph can frequently find traces of more than one strategic metal in almost any ordinary rock specimen, but unless such elements are present in significant proportions that can be determined readily by conventional wet or dry assaying methods, serious consideration cannot be given to such trace elements as sources of the metals we need for the National Defense Program.

MF-500

400

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS ADMINISTRATION

REFERENCE SLIP

DATE 7-29-53

REFERRED TO: ~~1 Mr. Hodges~~
~~2 Mr. Mittendorf~~ 4624
3 Mr. Martin
4 Rm. 3538
5

PRS REPLY

FOR:

..... Action	..... Recommendation
..... Approval	..... Record of .....
..... Comment	..... Referring to .....
..... Conference	..... Reply for signature of .....
..... Consideration	..... Rewriting
..... Filing	..... Signature
..... Instructions	..... Suggestions
..... Investigation	..... Your information
..... Initials	
..... Mailing	
..... Previous correspondence	

REMARKS:
Minals, draft sent to
Mr. Sandhoff 7/29/53

Check (X) before the items needing attention.

C. O. Mittendorf (for)

~~W. S. Martin~~
Initials of sender.

GPO 16—63815-1

MF-500

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS ADMINISTRATION

REFERENCE SLIP

DATE 7/28/53

REFERRED TO:

1. ~~Mr. Mittendorf - 4624~~
2.
3.
4.

P.R.S. - reply

FOR:

.....	Action	.....	Recommendation
.....	Approval	.....	Record of .....
.....	Comment	.....	Referring to .....
.....	Conference	.....	Reply for signature of .....
.....	Consideration	.....	Rewriting
.....	Filing	.....	Signature
.....	Instructions	.....	Suggestions
.....	Investigation	.....	Your information
.....	Initials		
.....	Mailing		
.....	Previous correspondence		

Please destroy when revised draft is cleared

REMARKS: Attached is partial draft of reply to William E. Walsh's letter of 7/22 to Secretary McKay. This should be cleared with someone like J. H. Hedges, Bur. Mines, since DMEA is being asked to defend USBM sampling results.

Check (X) before the items needing attention.

M. S. Martin
Initials of sender.

GPO 16—63815-1

Martin

Dear Bill:

This will acknowledge receipt of your letter of July 22, 1953, commenting on the merits of the Red Flats and other claims in Curry County, Oregon.

Your office had forwarded to Defense Minerals Exploration Administration the application of the owner, Associated Red Flats Mining Group, for aid in financing an exploration project on those claims, and that application (filed here under Docket No. DMEA 3052 - ~~Tungsten~~ Nickel) had been denied, as you were advised in my letter of July 7.

I would very much appreciate receiving a copy of ~~the~~ any report on ~~the~~ you may have test work ~~conducted by your consultant who has informed you that the same~~ indicating process that is used in Cuba could be used effectively on the Red Flats ore. With your permission, ~~your~~ such metallurgical data would also be transmitted to other Government agencies, more directly concerned with production problems, that ought to be advised immediately if there is good reason to anticipate a successful application of any existing process to nickel silicate mineralization of such low grade.

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Brief: The Bureau work indicated over 4 million tons of nickel bearing laterite in the area drilled, averaging 1.1 percent nickel. However, metallurgical tests conducted by the Bureau of Mines at Albany, Oregon failed to develop an economically feasible process for recovery of the nickel from this ore. Unless and until such a process is found, there appears to be little justification for further exploration to develop additional reserves. This Department feels the basis for denial by DMEA of Spur application for exploration assistance.

would be least likely to show good results in nickel content is contrary to our information. Records here show the area drilled was the most favorable, as indicated by earlier examinations by the Bureau, the Oregon State Department of Geology and Mineral Industries, and several private interests.

You can be sure that the Interior Department, so long as I speak for it, is not interested in aiding or abetting any monopoly; I believe strongly in competitive free enterprise. If your associates chose not to lease their claims to the M. A. Hanna Company, or if the owners of a nickel deposit in Josephine County chose to lease to that company, ~~neither decision would be of any concern to~~ this Department; would have no authority to intervene in any way. ~~nor does it concern this Department, in my opinion,~~ whether the M. A. Hanna Company obtains its nickel ore by land purchase or by lease.

~~So far as is now known~~, your belief that nickel is a strategic metal is correct. I have not, however, been able to confirm your statement "that the ore in the Red Flats area has considerable other strategic minerals in it," and have seen no evidence to justify the applicant's intention to explore for "cobalt, platinum, tin and other strategic minerals" in addition to nickel in that area. As you ~~may be familiar~~ probably know ~~must know~~, an experienced man with a spectrograph can frequently find traces of more than one strategic metal in almost any ordinary rock specimen, but unless such elements are present in significant proportions that can be determined readily by conventional wet or dry assaying methods, serious consideration cannot be given to such trace elements as sources of the metals we need for the National Defense Program.

pc

FILE COPY
Surname:
D.M.E.A.

Martin
Davis
Carlin
Office
Mittendorf

UNITED STATES
DEPARTMENT OF THE INTERIOR
OFFICE OF THE SECRETARY
WASHINGTON 25, D. C.

N.S. in R.R.

P.R.S. No. 1339

JUL -7 1953

Dear Bill:

This will acknowledge receipt of your letter of June 22, 1953, inquiring about the status of the application made to the Defense Minerals Exploration Administration by the Associated Red Flats Mining Group, covering the Red Flats and other claims in Curry County, Oregon, filed here under Docket No. DMEA 3052-Nickel.

Apparently your letter crossed in the mail a letter of June 23, 1953, from Mr. C. O. Mittendorf, Administrator, Defense Minerals Exploration Administration, advising the Associated Red Flats Mining Group that its application for exploration assistance was denied. For your information a copy of Mr. Mittendorf's letter is enclosed.

So far as we have been able to determine, the Nickel Mountain ore with which the M. A. Hanna Company is experimenting on a large scale near Riddle, Oregon, runs considerably higher in nickel than our estimate of the Red Flats material. Moreover, the iron content of the Nickel Mountain ore is low enough to lead the M. A. Hanna Company to believe that its process will produce ferro-nickel in salable form from that ore. The Red Flats material is not only significantly lower in nickel than the Nickel Mountain ore (1.11% as compared to 1.5%) but it also runs considerably higher in iron. It is, therefore, improbable that Hanna's process, in its present stage of development, could be applied to the Red Flats material.

The enclosures sent with your letter are returned herewith. Thank you for calling to our attention the clipping from The Oregonian of September 5, 1952.

With kindest personal regards,

Sincerely yours,

(sgd) Doug

Secretary of the Interior

Mr. William H. Walsh
Suite 201, American Building
Coos Bay, Oregon

Copy to: Docket No. DMEA 3052-Nickel
Adm. Reading File
Code 400
DMEA Field Team, Reg. II
H. W. Davis, US Bur. Mines
T. P. Thayer, US Geol. Survey
Secretary's Reading File
Asst.Sec'y for Mineral Resources
Mr. Imhoff

Enclosures

P.S. I would like to see you whenever possible.

Doug

THE OREGONIAN, FRIDAY, SEPTEMBER 5, 1952

MINE BUREAU FINDS TRACES OF NICKEL IN CURRY COUNTY

Continued progress in exploration of the Red Flats nickel deposit in Curry county, possibly a factor in a bourgeoning nickel industry in Oregon, was reported Thursday by Stephen Shelton, Albany regional director for the United States bureu of mines.

Shelton said testing of the 4000-acre area had not progressed far enough to announce results, but surface deposits were said to have a 1.5 percent nickel content.

The deposit is one which the Oregon state department of geology and mineral industries gave some attention in 1948 under direction of Fay W. Libbey, department director, with about the same findings.

Search Made Intensive

However, the bureau of mines is making more exhaustive investigation, and Shelton said November might see tentative reports ready for release.

The Red Flats deposit is approximately 50 miles from Nickel mountain, near Riddle, Ore. where the M. A. Hanna company, a steel concern of Cleveland, O., is planning to establish a mine and smelter, Shelton said.

Ore in the Nickel mountain deposit runs from 1.2 to 1.5 percent. Shelton said it is only comparatively recently and by a process developed by the bureau, that it has been enonomically feasible to develop Oregon ore of such low nickel percentage.

"Canadian sulphide ores are of about the same nickel content" said Shelton, "but the sulphide combination allows an inexpensive separation process. Oregon's nickel ores are in silicon combinations, which are more difficult to process."

Shelton indicated the belief that proving of an appreciable reserve of nickel in the Red Flats area could be expected to bring the same type of development that is planned for the Nickel mountain deposit by the Hanna company.

Clay Treatment Planned

Meanwhile, another activity of the bureau is scheduled to bear fruit soon in the form of an aluminum silicon alloy plant at Springfield or Eugene, Shelton said. This is a plant, explained, which Apex Smeltering company, Chicago, plans to build for processing of clay with high aluminum and silicon content into a type of aluminum used almost exclusively for castings.

The clay deposit is near Cottage Grove, and its processing, Shelton said, will use a system devised by the bureau.

C
O
P
Y

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Dmea
3052

WILLIAM E. WALSH

COOS BAY, OREGON

June 22, 1953

Honorable Douglas McKay
Secretary
Department of the Interior
Washington, D. C.

Dear Doug:

On the 20th day of May, 1953, I sent to the Spokane office of the Defense Minerals Exploration Administration the application of the Associated Red Flats Mining Group of Gold Beach, Oregon, under DMEA Order No. 1 for an exploration loan. This application covered nickel deposits in Curry County of approximately 4,000 acres.

So far we have never been able to get any information as to what has happened to our application, except that it was sent on to Washington. The docket number of this matter is DMEA-3052 and it was referred to the Iron and Ferro-Alloys Division. These people, approximately 31 in number, are very interested in getting going on this operation while we have some decent weather. I am wondering if there is anything that you can do to get a little action on the application. I really feel the applicants have something very worthwhile in Curry County, and the United States Bureau of Mines have already done considerable exploration themselves, although they have never issued a final report as yet. Nickel being one of the strategic minerals, we should be able to get this matter expedited.

I was certainly sorry that I missed you when you were West. I fully expected to get up to the Detroit Dam when you were there but didn't have a chance as I became involved in a term of court. I have heard some very fine remarks about the way you have handled yourself in Washington, and, of course, I have also heard the brickbats that have been thrown at you on the power deal. I would expect that, however, and no doubt you will have to live with that as long as you are in the Department. I hope that one of these days when you are in Oregon that you, Patterson, Ralph Cake and some of the rest of us will be able to sit around and talk a little politics. There is much to talk about and much to be done during the next two or three years and some of it isn't going to be too easy.

I am enjoying my work on the Board of Higher Education though we have had no end of problems with the Anderson Report and now with losing the President of the University of Oregon. Of course, maybe that will give you fellows from Oregon State a chance to catch up to Oregon--or don't you agree with me?

With best regards to you and your good wife, I remain

Sincerely yours,

/s/ Bill

WM. E. WALSH

WEW:jj
Enclosures: Clipping from the Oregonian dated September 5, 1952
Statement on proposed work of Associated Red Flats Mining Group, Gold Beach, Oregon.

FILE COPY
SURNAME:

400

Rutledge
Nightingale
Thayer
Nichol
Hedges
Selfridge
Johnson

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS ADMINISTRATION
WASHINGTON 25, D. C.

JUN 23 1953

Associated Red Flats Mining Group
c/o Harry Hedderly
Gold Beach, Oregon

Re: Docket No. DMEA 3052 - Nickel
Associated Red Flats Mining Group
Red Flats et. al association claims
Curry County, Oregon

Dear Mr. Hedderly:

Your application for aid for an exploration project and other data available to us in Washington concerning the above referenced property have been reviewed.

Projects approved by the Defense Minerals Exploration Administration, must in its judgment, show definite promise of yielding materials of acceptable grade in quantities that will significantly improve the mineral supply position for the National Defense Program.

Careful study of all our information, although noting the occurrence of low grade nickel mineralization on your claims, indicates to us that the probability of disclosing minable ore reserves by your proposed program is not sufficiently promising to justify Government participation. We regret to advise you, under these circumstances, that your application for exploration assistance is denied.

We wish to thank you for your interest in the Defense Minerals Program and for bringing your property to our attention.

Sincerely yours,

C. O. Mittendorf (fw)

Administrator

FARutledge:foc
6-18-53

cc: Docket
Code 400
Adm. Reading File
FT. REG. II
Oper. Comm.
H. W. Davis, USBM
T. P. Thayer, USGS

P.H.
6-23-53

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION
WASHINGTON 25, D. C.

400

June 18, 1953

Memorandum

To: Administrator, DMEA

From: Iron and Ferro-Alloys Division, DMEA

Subject: Denial of exploration project in the amount of $77,945.00
Associated Red Flats Mining Group - Docket No. DMEA 3052
Red Flats et al association claims
Curry County, Oregon

The denial of the subject application by this Division is based on the following information:

1. The applicant proposed to explore a lateritic deposit for the occurrence of nickel. The program was to consist of the following items.

a. Completely survey, subdivide and map entire area.

b. Build access roads to lateral from Forest Service road which traverses the approximate center of ore body to claim boundaries at six points.

c. Build cat and jeep trails to lateral from access roads wherever necessary to facilitate drilling.

d. Dig bulldozer pits to bedrock at intervals of one-fourth mile to facilitate bulk sampling.

e. Drill four-inch holes to bedrock at intervals of from 200 to 400 feet and sample each foot of depth.

f. All pits and drill holes to be marked, numbered and indicated on map.

2. The Red Flats nickeliferous deposit of laterite is located about 8 miles southeast of Gold Beach, Oregon, in Curry County. The laterite is confined to Red Flats and varies in depth up to 5 feet or more.

The property was originally located as a gold - quicksilver prospect in about 1932. In June 1945 after the property had been examined many times by private interests, the prospect was examined and sampled by the Bureau of Mines. Twenty-five samples were taken the majority of which came from two small areas that as indicated by previous sampling contained the best grade material. The samples contained only a trace of mercury and gold and the nickel ranged from 0.12 to 1.35 percent. Maximum depth sampled was 42 inches.

The deposit was examined by the Oregon State Department of Geology and Minerals Industries during the summer of 1946 and again in August 1947.

The Bureau of Mines continued their investigation of the Red Flats deposit during the summer of 1952. Twenty-two churn drill holes were spaced on a grid pattern on the most favorable area of the deposit. Twelve percent of the samples contained 1 percent of more of nickel and the Bureau of Mines estimated a reserve of 4,200,000 tons of 1.11 percent nickel ore.

Beneficiation tests of the nickel ore by the Bureau of Mines have not been found effective. Leaching at high temperatures with sulfuric acid is effective but iron and magnesium consume so much acid that the process is not economic at present. Direct smelting can be accomplished in an electric furnace using hogged fuel,(residue from timber sawmills) as a reductant, but the Ferro-alloy produced is not of the desired grade.

3. Denial of the subject application is recommended because of the low grade of the nickeliferous material and its occurrence as a high-iron, "red soil" laterite. Tests have shown that the deposit is not amenable to either direct smelting or other known metallurgical treatment. Exploration of deposits of this type will not be warranted until a successful metallurgical process is developed for their treatment.

4. The Commodity Division of the Bureau of Mines recommends denial.

5. The Commodity Division of the Geological Survey concurs with the denial.

W S Martin

W. S. Martin, Acting Chief
Iron and Ferro-Alloys Division

FILE COPY
SURNAME:

400

Rutledge
Martin
Thayer

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS ADMINISTRATION
WASHINGTON 25, D. C.

June 18, 1953

Memorandum

To: Administrator, DMEA

From: Iron and Ferro-Alloys Division, DMEA

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Associated Red Flats Mining Group
Red Flats et al association claims
Curry County, Oregon

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c. Build cat and jeep trails to lateral from access roads wherever necessary to facilitate drilling.

d. Dig bulldozer pits to bedrock at intervals of one-fourth mile to facilitate bulk sampling.

e. Drill four-inch holes to bedrock at intervals of from 200 to 400 feet and sample each foot of depth.

f. All pits and drill holes to be marked, numbered and indicated on map.

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The property was originally located as a gold - quicksilver prospect in about 1932. In June 1945 after the property had been examined many times by private interests, the prospect was examined and sampled by the Bureau of Mines. Twenty-five samples were taken the majority of which came from two small areas that as indicated by previous sampling contained the best grade material. The samples contained only a trace of mercury and gold and the nickel ranged from 0.12 to 1.35 percent. Maximum depth sampled was 42 inches.

The deposit was examined by the Oregon State Department of Geology and Mineral Industries during the summer of 1946 and again in August 1947.

The Bureau of Mines continued their investigation of the Red Flats deposit during the summer of 1952. Twenty-two churn drill holes were spaced on a grid pattern on the most favorable area of the deposit. Twelve percent of the samples contained 1 percent of more of nickel and the Bureau of Mines estimated a reserve of 1,200,000 tons of 1.11 percent nickel ore.

Beneficiation tests of the nickel ore by the Bureau of Mines have not been found effective. Leaching at high temperatures with sulfuric acid is effective but iron and magnesium consume so much acid that the process is not economic at present. Direct smelting can be accomplished in an electric furnace using bogged fuel,(residue from timber sawmills) as a reductant, but the Ferro-alloy produced is not of the desired grade.

3. Denial of the subject application is recommended because of the low grade of the nickeliferous material and its occurrence as a high-iron, "red soil" laterite. Tests have shown that the deposit is not amenable to either direct smelting or other known metallurgical treatment. Exploration of deposits of this type will not be warranted until a successful metallurgical process is developed for their treatment.

FARutledge:foc
6-18-53
cc: Docket
Code 400
Adm. Read. File
Oper. Comm.

4. The Commodity Division of the Bureau of Mines recommends denial.

5. The Commodity Division of the Geological Survey concurs with the denial.

W. S. Martin, Acting Chief
Iron and Ferro-Alloys Division

Docket

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION
WASHINGTON 25, D. C.
~~XXXXXXXXXXXXXXXXXX~~
No. 157 Howard Street
Spokane 4, Washington

June 12, 1953

Mr. William D. Walsh
Suite 201 American Building
Coos Bay, Oregon

Re: Docket No. DMA-3024 (nickel)
Associated Red Flats Mining Group
Curry County, Oregon

Dear Mr. Walsh:

Acknowledgment is made of your letter of May 20 in which you enclosed the application for an exploration loan of the Associated Red Flats Mining Group, Gold Beach, Oregon.

This application was forwarded to the Defense Minerals Exploration office in Washington, D. C., on May 28 and you may expect to hear from them shortly.

Sincerely yours

A. E. Weissenborn
Executive Officer, DMEA
Field Team, Region II

cc: DMEA (2)
USBM (2)

Docket

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF MINES
WASHINGTON 25, D. C.

June 10, 1953

Memorandum

To: W. S. Martin, Defense Minerals Exploration Admin.

From: H. W. Davis, Bureau of Mines

Subject: DMEA 3052 - Nickel. Associated Red Flats Mining Group. $77,945.

WSM

The Red Flats deposit was investigated by the Bureau of Mines in the summer of 1952. Originally nine unpatented claims in the property were located as a gold-quicksilver prospect. No production of these metals was ever made, but indications of garnierite were found. This was the principal object of the work done by the Bureau.

The deposit was surveyed and mapped. Twenty-two holes totaling 1,017 feet were drilled. Twleve percent of the 204 samples taken contained over 1.00 percent nickel. The sampling resulted in an estimate of 4,200,000 tons of 1.11 percent ore.

The work done on this property did not indicate the probability of its making a significant contribution toward the Nation's supply of nickel. Moreover, beneficiation of the ore was not found effective.

The proposal, in my opinion, is not justified.

H. W. Davis

H. W. Davis

original only received 6-11-53 ls

JUN 1 1953

dmea 3052
Docket

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION
WASHINGTON 25, D. C.

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
JUN 2 1953

WSM

1201 N. Division St.
Spokane 2, Washington
May 29, 1953

Mr. George C. Selfridge, Chairman
Operating Committee, DMEA
Department of the Interior
Washington 25, D. C.

Subject: Application for a DMEA contract by Associated Red Flats Mining Group on Red Flats Nickel Property, Curry County, Oregon

Dear Mr. Selfridge:

This application was transmitted to you by letter dated May 26, 1953 from Mr. Thor H. Kiilsgaard, acting for A. E. Weissenborn, Executive Officer, DMEA Field Team, Region II.

In the text of his letter Mr. Kiilsgaard states that "It is reported that the Red Flat deposit was examined by U. S. Bureau of Mines engineers during World War II but this publication is not in our files."

The purpose of this letter is to furnish additional information on the Red Flats property. Actually, this property was churn drilled by the Bureau of Mines in the summer of 1952 in connection with a cooperative program financed in part by the California-Oregon Power Co. A report has been prepared for publication but has not yet been forwarded to the Washington office of the Bureau of Mines; however, copies of a brief advance report furnished to the Associated Red Flats Mining Group have been sent to the Washington office.

The Bureau manuscript for publication describes the ore and its geologic setting, pointing out similarities to the larger Riddle Mountain deposit. At Red Flats a brick red soil mantle 5 feet or more in depth overlies a body of peridotite. Alteration of the peridotite and leaching of a minute content of nickel have resulted in perceptible concentration of this metal in the form of garnierite in the altered and partly altered peridotite.

Twenty-two holes were churn drilled on a grid pattern covering a flat-topped ridge. This work indicated about 4 million tons of nickel-bearing laterite averaging 1.1% Ni.

Tests on the laterite indicated that ore dressing is not particularly effective.

Copy retained 400

If you want additional information from the Bureau of Mines manuscript we can furnish a copy in advance of publication upon approval of the California-Oregon Power Co.

Sincerely yours,

M. E. Volin, Member
DMEA Field Team
Region II

June 1, 1953

Mr. Harry Hedderly
Gold Beach, Oregon

Subject: DMEA-3052
Re: Exploration Assistance

My dear Mr. Hedderly:

The receipt of your application dated May 16, 1953 for exploration assistance under the Defense Production Act of 1950, as amended, is hereby acknowledged.

Your application has been assigned Docket Number DMEA-3052 and referred to the Iron and Ferro-Alloys Division.

Kindly refer to DMEA-3052 in any future correspondence relating to your application.

Sincerely yours,

ROBERT E. ADAMS

Robert E. Adams
Chief, Operations Control
and Statistics Division

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION
WASHINGTON 25, D. C.

June 1, 1953

Memorandum

To: Executive Officer, DMEA Field Team, Region II

From: Chief, Operation's Control and Statistics Division

Subject: Assignment of Docket Number

There is listed below the assigned docket number to an application recently received from Region II.

DMEA - 3052 - Associated Red Flats Mining Group

ROBERT E. ADAMS

Robert E. Adams,
Chief, Operation's Control
and Statistics Division

38226

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION

~~WASHINGTON 25, D.C.~~
So. 157 Howard Street
Spokane 4, Washington

May 26, 1953

Mr. George C. Selfridge, Chairman
Operating Committee, DMEA
Department of the Interior
Washington 25, D. C.

Dear Mr. Selfridge:

Enclosed are the original and two copies of an application for a DMEA contract submitted by the Associated Red Flats Mining group, concerning the Red Flat nickel-bearing property, Curry County, Oregon. One copy of the application has been retained for the files of this office.

The Red Flat property is described in the Ore Bin, Oregon State Department of Geology and Mineral Industries, Vol. 9, No. 3, March 1947. That publication describes the rocks of the area as peridotite and serpentine, which, upon weathering, have developed a lateritic red soil in which there has been some concentration of nickel. The authors of the Oregon report state that during the course of their examination four auger holes were drilled in the Red Flat deposit, the deepest of which was 11 feet. They found the nickel content of the laterite to increase with depth and that all samples contained chromite. Nickel analyses are given for each hole, the content ranging from 0.29 percent to 1.46 percent Ni. Petrographic examination of the laterite from Hole No. 1 failed to reveal the nickel-bearing minerals although chemical analyses show that most of the nickel occurs in the slimes which are largely limonite. They note that weathering of the peridotite has concentrated the nickel, and that there are but few traces of nickel in the adjacent fresh peridotite.

It is reported that the Red Flat deposit was examined by U. S. Bureau of Mines engineers during World War II but this publication is not in our files.

A description of nickel-bearing laterite, of a similar type of deposit, is to be found in U. S. Geol. Survey Bulletin 931-I, Nickel deposits near Riddle, Douglas County, Oregon, by William T. Pecora and S. Warren Hobbs.

As the aforementioned publication of the Ore Bin contains appreciable information on the geology of the Red Flat property, no field examination will be scheduled unless requested by the Operating Committee.

Sincerely,

Thor H. Kiilsgaard

Thor H. Kiilsgaard
For: A. E. Weissenborn
Executive Officer, DMEA
Field Team, Region II

Enclosure

cc: USBM (2)

MF-103
(Revised April 1952)

UNITED STATES DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS EXPLORATION ADMINISTRATION

Form Approved.
Budget Bureau No. 42-R1035.2.

RECEIVED MAY 29 1953 U. S. G. S. SPOKANE, WASH.

APPLICATION FOR AID IN AN EXPLORATION PROJECT, PURSUANT TO DMEA ORDER 1, UNDER THE DEFENSE PRODUCTION ACT OF 1950, AS AMENDED

Not to be filled in by applicant

Docket No. DMEA-3052
Metal or Mineral
Date Received 5/29/53
Estimated Cost
Participation (Government %)

INSTRUCTIONS

1. *Name of applicant.*—(*a*) State here your full legal name, in the form in which you will wish to contract, and your mailing address: Associated Red Flats Mining Group, c/o Harry Hedderly, Gold Beach, Oregon, a partnership

(*b*) If other than an individual, add to your name above whether a corporation, partnership, etc., and the name of the State in which incorporated or otherwise organized.

(*c*) If a corporation, add to above statement, titles, names and addresses of officers.

(*d*) If a partnership, add to the above statement the names and addresses of all partners.

2. *General.*—Read DMEA Order 1, "Government Aid in Defense Exploration Projects," before completing this application. Submit this application and all accompanying papers in quadruplicate (four copies), with your name and address on each sheet of the application and on all accompanying papers. Where sufficient space is not provided on the form for all required information, state it on an accompanying paper, with a reference in each case to the instruction to which it refers by number. Comply with all applicable instructions; or, if not applicable, so state. File the application with Defense Minerals Exploration Administration, Department of the Interior, Washington 25, D. C., or with the nearest field executive officer thereof.

3. *Applicant's property rights.*—(*a*) State the legal description of the land upon which you wish to explore, including all land which you possess or control that may be benefited by the exploration, and excluding any land or interest in land which is not to be included in the exploration project contract All of Sections 18, 19 & 30, W½ Sec. 20, 29, & 32, E½, E½W½, Sec. 31, Town. 37 S. Range 13 West, WM, Curry County, Ore. S½, S½N½, NE¼NE¼, NW¼NW¼, Sec. 24, SE¼ Sec. 13, Town. 37 S. Range 14 West, WM, Curry County, Oregon (4080 acres).

(*b*) State any mine name by which the property is known. Red Flats.

(*c*) State your interest in the land, whether owner, lessee, purchaser under contract, or otherwise Owners

(*d*) If you are not the owner, submit with this application a copy of the lease, contract, or other document under which you control the property.

(*e*) If you own the land, describe any liens or encumbrances on it None

(*f*) If the land consists of unpatented claims, add to the description above, the book and page numbers for each recorded location notice. Claim records attached.

4. *Physical description.*—(*a*) Describe in detail any mining or exploration operations which have been or now are being conducted upon the land, including existing mine workings and production facilities. State your interest, if any, in such operations. Also describe accessibility of mine workings for examination purposes.

(*b*) State past and current production, and ore reserves, if any, giving quantities and grades.

(*c*) Describe the geologic features of the property, including mineralization, type of deposit (vein, bedded, etc.), and your reasons for wishing to explore. Illustrate with maps or sketches. Send with your application (but not necessarily as a part of it) any geologic or engineering report, assay maps, or other technologic information you may have, indicating on each whether you require its return to you. Maps of area enclosed.

(*d*) State the facts with respect to the accessibility of the project: Access roads, distances to shipping, supply and residence points. These facts known to Bureau.

(*e*) State the availability of manpower, materials, supplies, equipment, water, and power. All available.

5. *The exploration project.*—(*a*) State the mineral or minerals for which you w[illegible]o explore Nickel, cobalt, platinum, tin and other strategic minerals

(*b*) Describe fully the proposed work, including a map or sketch of the property showing a plan (and cross sections if needed) of any present mine workings, and the location of the proposed exploration work as related to such features as contacts, veins, ore-bearing beds, etc. See exhibit 5 (b)

(*c*) The work will start within 10 days and be completed within 12 months from the date of an exploration project contract.

(*d*) State the operating experience and background of the applicant with relation to the ability to carry out such exploration project, and also that of the person or persons who will supervise the operations. See exhibit 5 (d)

6. *Estimate of costs.*—Furnish a detailed estimate of the costs of the proposed work (you will have to use a separate sheet), under the following headings. Add the totals under all headings to give the estimated total cost of the project:

(*a*) *Independent contracts.*—(Note.—If the applicant does not intend to let any of the work to contractors, write "none" after this item. To the extent that the work is to be contracted, do not repeat the cost of the contract-work in subsequent items.) State the cost of any proposed independent contracts for the performance of all or any part of the work, expressed in terms of units of work (such as per foot of drilling, per foot of drifting, per hour of bulldozer operations, per cubic yard of material moved, etc.). See exhibit 6 (None)

(*b*) *Labor, supervision, consultants.*—Include an itemized schedule of numbers, classes and rates of wages, salaries or fees for necessary labor, supervision and engineering and geological consultants. See exhibit 6

(*c*) *Operating materials and supplies.*—Furnish an itemized list, including items of equipment costing less than $50 each, and power, water and fuel. See exhibit 6

(*d*) *Operating equipment.*—Furnish an itemized list of any operating equipment to be rented, purchased, or which is owned and will be furnished by the Operator, with the estimated rental, purchase price, or suggested use-allowance based on present value, as the case may be. See exhibit 6

(*e*) *Rehabilitation and repairs.*—Furnish a detailed list showing the cost of any necessary initial rehabilitation or repairs of existing buildings, installations, fixtures, and movable operating equipment, now owned by the Operator and which will be devoted to the exploration project. See exhibit 6

(*f*) *New buildings, improvements, installations.*—Furnish a detailed list showing the cost of any necessary buildings, fixed improvements, or installations to be purchased, installed or constructed for the benefit of the exploration project. None

(*g*) *Miscellaneous.*—Furnish a detailed list showing the cost of repairs to and maintenance of operating equipment (not including initial rehabilitation or repairs of the Operator's equipment), analytical work, accounting, workmen's compensation and employers' liability insurance, and payroll taxes. See 6 (e)

(*h*) *Contingencies.*—Give an estimate of any necessary allowances for contingencies not included in the costs stated above.

NOTE.—No items of general overhead, corporate management, interest, taxes (other than payroll and sales taxes), or any other indirect costs, or work performed or costs incurred before the date of the contract, should be included in the estimate of costs. See exhibit 6

7. (*a*) Are you prepared to furnish your share of the cost of the proposed project in accordance with the regulations on Government participation (Sec. 7, DMEA No. 1)? Yes

(*b*) How do you propose to furnish your share of the costs? Money, use of equipment and contributed labor

☐ Money ☐ Use of equipment owned by you ☐ Other

Explain in detail on acompanying paper.

CERTIFICATION

The undersigned, whether as an individual, corporate officer, partner, or otherwise, both in his own behalf and acting for the applicant, certifies that the information set forth in this form and accompanying papers is correct and complete, to the best of his knowledge and belief.

Dated May 16, 1953

Associated Red Flats Mining Group
(Applicant)

By H. F. Hedderly

Title 18, U. S. Code (Crimes), Section 1001, makes it a criminal offense to make a willfully false statement or representation to any department or agency of the United States as to any matter within its jurisdiction.

U. S. GOVERNMENT PRINTING OFFICE 16—66551-1

Associated Red Flats Mining Group
Gold Beach, Oregon

Instruction 1 (d) List of Partners

Al LaChance, Agnes, Oregon
G. F. Anderson, Coos Bay, Oregon
LaVern Chesley, Coos Bay, Oregon
J. L. Kingery, Coos Bay, Oregon
Philip Lehl, Coos Bay, Oregon
Ida Matson, Coos Bay, Oregon
Joseph McKeown, Coos Bay, Oregon
George Ross, Coos Bay, Oregon
E. G. Sampson, Coos Bay, Oregon
Harold Savage, Coos Bay, Oregon
Robert Seip, Coos Bay, Oregon
George Spady, Coos Bay, Oregon
George Stout, Coos Bay, Oregon
J. F. Wallace, Coos Bay, Oregon
J. A. Walsh, Coos Bay, Oregon
Wm. E. Walsh, Coos Bay, Oregon
Don Alcorn, Gold Beach, Oregon
Paul Connet, Gold Beach, Oregon
H. Crossen, Gold Beach, Oregon
Edna Hedderly, Gold Beach, Oregon
H. F. Hedderly, Gold Beach, Oregon
John Hill, Gold Beach, Oregon
Albert R. Myers, Jr., Gold Beach, Oregon
George Myers, Gold Beach, Oregon
David Shaw, Gold Beach, Oregon
Mary Smedberg, Gold Beach, Oregon
Grady Younce, Gold Beach, Oregon
George Yost, North Bend, Oregon
Ivah R. Edwards, Portland, Oregon
Charles H. Skinner, Portland, Oregon
Paul Sibley, Portland, Oregon

Associated Red Flats Mining Group
Gold Beach, Oregon

Instruction 3 (f) Claims Records

Mining claims held under mineral rights by the Associated Red Flats Mining Group and recorded with the County Clerk, Curry County, Gold Beach, Oregon.

Red Flats	Association	claims	No. 1 to 9 inc.	Recorded in Vol. 10
Hunters Creek	"	"	1 to 4 inc.	Recorded in Vol. 12
North Fork	"	"	1 to 3 inc.	Recorded in Vol. 12
Sunset	"	"		Recorded in Vol. 12
Red Rock	"	"		Recorded in Vol. 12
South Side No. 1		"		Recorded in Vol. 12
Bonanza	"	"		Recorded in Vol. 10
Red Ridge	"	"		Recorded in Vol. 11
Red Boy	"	"		Recorded in Vol. 12
No. 23	"	"		Recorded in Vol. 12
Black Butte	"	"		Recorded in Vol. 13
Cedar Flats	"	"		Recorded in Vol. 13
Red "E"	"	"		Recorded in Vol. 13

Associated Red Flats Mining Group
Gold Beach, Oregon

Instruction 5 (b)

While the Associated Red Flats mining claims near Gold Beach in Curry County, Oregon, embrace an area of some 4,000 acres of highly mineralized ground with many millions of tons of positive ores in sight, less than 200 acres of the area have been systematically explored and tested.

Indications are that the entire ore body contains at least 1½% nickel, 36% iron, 10% magnesium, and substantial amounts of chrome, manganese, cadmium and free mercury. Cobalt, tin, platinum and gold have also been found to be present. Limited surveys and determinations by both the U. S. Bureau of Mines and the Oregon State Department of Geology and Mineral Industries have proven all of the above named minerals to be present in this ore body. Copies of their respective reports are available.

It is the belief of the claim holders that an intensive mineral survey of the property will prove it to be a vast and important source of several strategic minerals. Numerous engineers who have made preliminary examinations of the claims concur in this belief. It is for the purpose of making an intensive survey of said ore body that financial assistance is now being sought from the Defense Minerals Administration. Following is an outline of the project the claim holders propose:

1. Completely survey, subdivide and map entire area.

2. Build access roads to lateral from Forest Service road which traverses the approximate center of ore body to claim boundaries at six points.

3. Build cat and jeep trails to lateral from access roads wherever necessary to facilitate drilling.

4. Dig bulldozer pits to bedrock at intervals of one-fourth mile to facilitate bulk sampling.

5. Drill four-inch holes to bedrock at intervals of from 200 to 400 feet and sample each foot of depth.

6. All pits and drill holes to be marked, numbered and indicated on map.

7. Duplicates of all samples to be numbered, catalogued and stored for future reference.

Associated Red Flats Mining Group
Gold Beach, Oregon

Instruction 5 (b) continued

In order that all parties concerned may be assured that the various phases of the work will be carried out in accordance with accepted practices, it is proposed that the project, if it is carried out, be under the general supervision of a registered, professional mining engineer, and a qualified chemical and metalurgical engineer.

Associated Red Flats Mining Group
Gold Beach, Oregon

Instruction 5 (d)

Applicants are experienced in all phases of proposed exploration work, including the operation of heavy equipment for any type of mining operation.

Associated Red Flats Mining Group
Gold Beach, Oregon

Exhibit for Instruction 6 - Estimate of costs

6 (a) Independent contracts. None

6 (b) Labor, supervision, consultants.

Labor -- 6 men at $3,600.00	21,600.00	
Mining engineer -- part time	5,000.00	
Chemical and Metallurgical Engineer -- part time	4,000.00	
Registered assayer -- full time	6,000.00	
Clerical and legal	4,500.00	$41,100.00

6 (c) Operating materials and supplies.

Gas and oil	3,500.00	
Hand tools (to include tools for the repair of equipment, saws, axes, shovels, etc.)	300.00	
Additional laboratory equipment (to include chemicals, instruments, sample bags, etc.)	1,500.00	
Additional camp equipment (to include stoves, beds, gas operated water pump, plumbing, etc.)	600.00	5,900.00

6 (d) Operating equipment.

D6 cat with blade and drum	16,000.00	
Jeep truck with power take-off and drill equipment	3,500.00	
Power saw	400.00	19,900.00

6 (e) Rehabilitation and repairs.

Repair and maintenance of equipment	2,500.00	
Red Flats Camp - repairs:		
roofing 4 cabins	170.00	
lumber and other building material	600.00	
pipe and pipe fittings	80.00	
labor	300.00	
Hedderly Camp - repairs:		
roofing 4 buildings	300.00	
lumber and other building material	700.00	
repairs to water system including pipe and pipe fittings	285.00	
new wiring	160.00	
labor	450.00	5,545.00

6 (f) New buildings, improvements, installations. None

Associated Red Flats Mining Group
Gold Beach, Oregon

Instruction 6 continued

6 (g) Miscellaneous. See 6 (e).

6 (h) Contingencies.

Repairs to existing buildings, insurance, telephone and telegraph, necessary travel expense, emergency road maintenance	5,500.00
TOTAL ESTIMATE OF COSTS	$77,945.00

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS ADMINISTRATION
WASHINGTON 25, D. C.

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Mr. George C. Selfridge, Chairman

Operating Committee

Defense Minerals Exploration Administration

Department of the Interior

Washington 25, D. C.

DMEA-3052

Associated Red Flats Mining Group
Gold Beach, Oregon

Instruction 4 (c)

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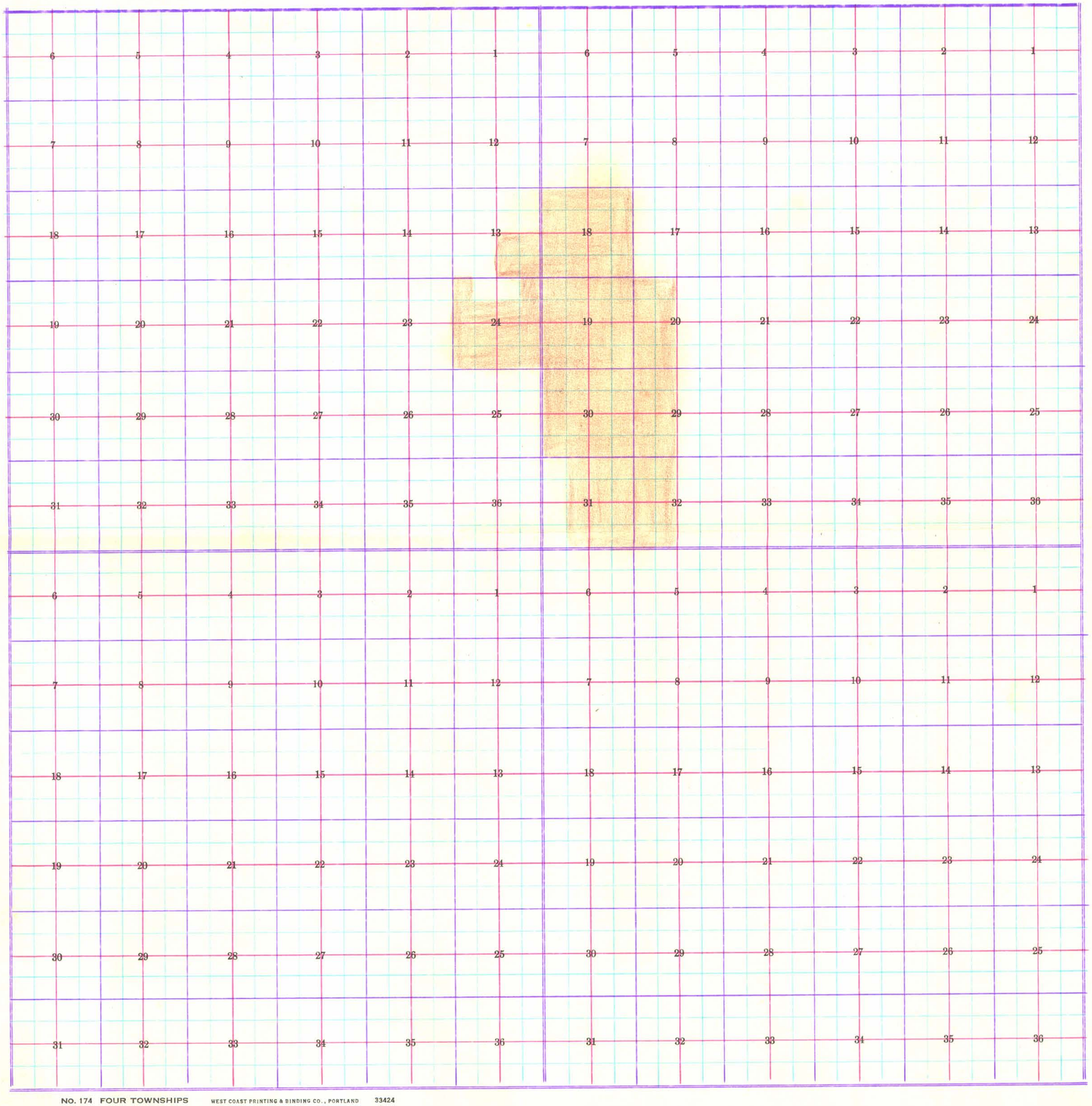

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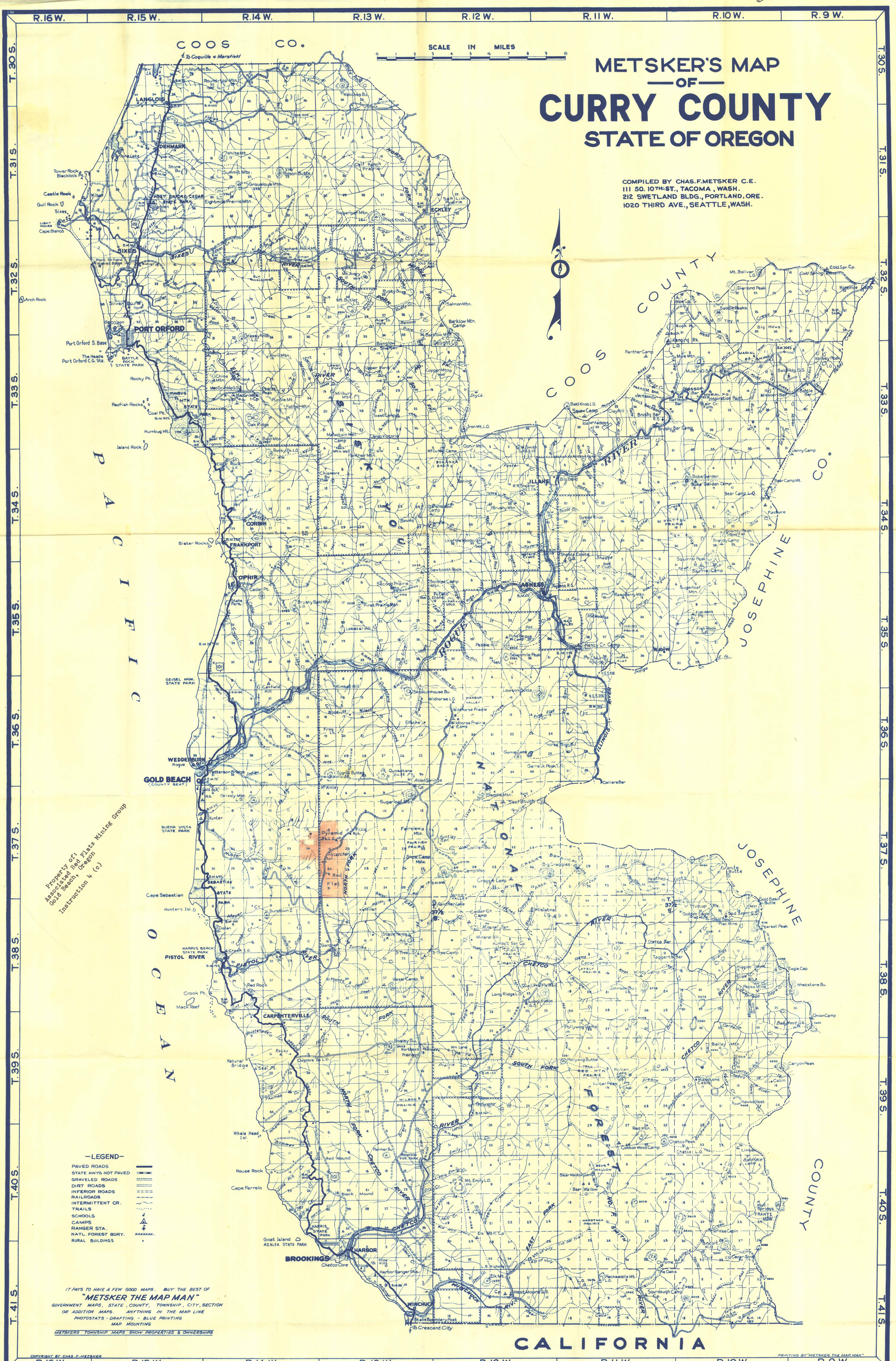
DMEA-3052

METSKER'S MAP
—OF—
CURRY COUNTY
STATE OF OREGON

COMPILED BY CHAS. F. METSKER C.E.
111 SO. 10TH ST., TACOMA, WASH.
212 SWETLAND BLDG., PORTLAND, ORE.
1020 THIRD AVE., SEATTLE, WASH.

SCALE IN MILES



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