The Open Court

A MONTHLY MAGAZINE

Devoted to the Science of Religion, the Religion of Science, and the Extension of the Religious Parliament Idea

Founded by Edward C. Hegeler

VOLUME XL (No. 4) APRIL, 1926 (No. 839)

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FOUNDERS OF THE NATIONAL ACADEMY OF SCIENCES.
Left to Right: Benjamin Peirce, Alexander Dallas Bache, Joseph Henry, Louis Agassiz,
Abraham Lincoln, Senator Henry Wilson, Admiral Charles H. Davis,
and Benjamin Apthorp Gould.

Frontispiece to the Open Court.

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NATIONAL ACADEMY OF SCIENCES

BY PAUL BROCKETT

SOME sixty-six years ago, just before the fourth of March, there arrived in Washington a man noted for his height and apparent awkwardness of movement. There was no cheering, and he, with one other, stepped from the train into a closed carriage. A cold and dreary day, a few days later, he emerged from the Willard House with President Buchannan to go to the Capitol to take the oath of office as President of the United States. This man—Abraham Lincoln—took the oath amid an unfavorable, half-jeering crowd which was later to realize that his forsightedness firmly set the fundamentals of this Government on a stable basis. When he came to the White House he regarded the scientific investigator as a luxury, but later, after associating with Joseph Henry and others, his whole attitude changed—he realized what deep thinkers the investigations into the unknown produced. Science in pure research was then struggling for recognition, and it was his act as President approving the Bill incorporating the National Academy of Sciences that gave the world the foundation for one of the greatest scientific organizations of modern times. The real purpose of the Act of Incorporation was to secure advice on war problems for the Government so it stipulated that "the Academy shall, whenever called upon by any department of the Government, investigate, examine, experiment, and report upon any subject of science or art, the actual expense of such investigations, examinations, experiments, and reports to be paid from appropriations which may be made for the purpose, but the Academy shall receive no compensation whatever for any services to the Government of the United States." The advice of the Academy has been requested and used by the Government many times. After the Civil War period, the National Academy had a troubled existence for many years, but the need

for such an organization in American science and the belief of the Academicians in its ultimate success resulted in the Academy finally coming into its own.

The dream of its founders and all who have been interested in its welfare became a reality with the completion of the building for the National Academy of Sciences and National Research Council, the home of science in America.

The housing of the academy headquarters had received serious consideration since its establishment by act of Congress in 1863. Through the interest of the secretaries of the Smithsonian Institution (two of whom have been presidents of the academy—Joseph Henry, the first Secretary of the Smithsonian Institution, and Charles Doolittle Walcott, its present Secretary), the Smithsonian for over sixty years generously furnished quarters for the general offices of the academy, stored its publications and books for its library, and shared whatever facilities were available.

When the beginning of the World War demonstrated that the older methods of warfare must give way to those devised from the results of research, the President of the United States requested the National Academy of Sciences to organize the scientific resources of this country for the national defense. In immediate accordance with this request the academy appointed a committee which resulted in the organization of the National Research Council of the National Academy of Sciences. The bringing together of men for the solution of war problems made still more acute the need for larger quarters than those available at the Smithsonian Institution. Temporary offices for the research council were rented, but the administrative offices of the academy remained at the Smithsonian Institution.

After the armistice was signed in 1918 the President of the United States, appreciating the value of the work accomplished by the academy through its research council, issued an executive order requesting the National Academy of Sciences to perpetuate the research council under its charter on a peace basis; and with the reorganization of the research council, a building to house both bodies became an absolute necessity.

The efforts were crowned with a promise of success the following year when the Carnegie Corporation of New York adopted a resolution to the effect that if the National Academy of Sciences could secure the site for a building through other sources the corporation would give funds sufficient for the erection of a building and an endowment for the maintenance of the building and the

research council. With this in view the academy was able to secure adequate contributions from friends of science throughout the country to purchase the square between Twenty-first and Twenty-second and C and Upper Water Streets, Washington, at a cost of approximately $185,000, given by the following persons: Edward Dean Adams, Charles F. Brush, George W. Crile, E. A. Deeds, Pierre S. DuPont, George R. Eastman, Arthur H. Fleming, Henry Ford, Mrs. E. H. Harriman, H. E. Huntington, Thomas D. Jones, Charles F. Kettering, Adolph Lomb, Harold F. McCormick, A. W. Mellon, Raphael Pumpelly, Julius Rosenwald, John L. Severance, Ambrose Swasey, C. H. Swift, the trustees of the Commonwealth fund, and the Corning Glass Works. Through the closing of Upper Water Street by Congress, and the assistance of the Chief of Engineers of the United States Army in securing the transfer to the academy of a triangular piece of ground belonging to the Government at the southwest of the academy lot, the building site was squared out to B Street. The academy site is now bounded by B and C and Twenty-first and Twenty-second streets. It is 531 feet long and 422 feet deep. The building faces B Street, looking out on Potomac Park and the Lincoln Memorial just opposite.

Upon the securing of this site, the Carnegie Corporation of New York definitely set aside the sum of $5,000,000 for the academy and research council, $1,450,000 of which was made available for the construction of the building.

The Commission of Fine Arts was consulted in the selection of an architect, and on its suggestion the academy after due consideration selected Bertram Grosvenor Goodhue, architect, of New York.

After the architect's plans had been carefully studied and approved by the academy council and the research council, ground was broken in the spring of 1922 for the laying of foundations for a marble structure. In view of the fact that the site was once an old stream bed and filled-in tidal flats, every precaution was taken to make the foundations secure. Seventy-four concrete piers, five feet square, were sunk to bedrock to support the girders upon which the walls rest, and the girders which support the marble terrace rest on thirty-three large steel tubes driven to bedrock, emptied, and filled with concrete.

The corner stone was laid in the southwest corner on October 30, 1922, with simple ceremonies. Charles Doolittle Walcott, then president of the academy, was the first to place cement under the stone,

and he was followed by members of the academy and research council in Washington.

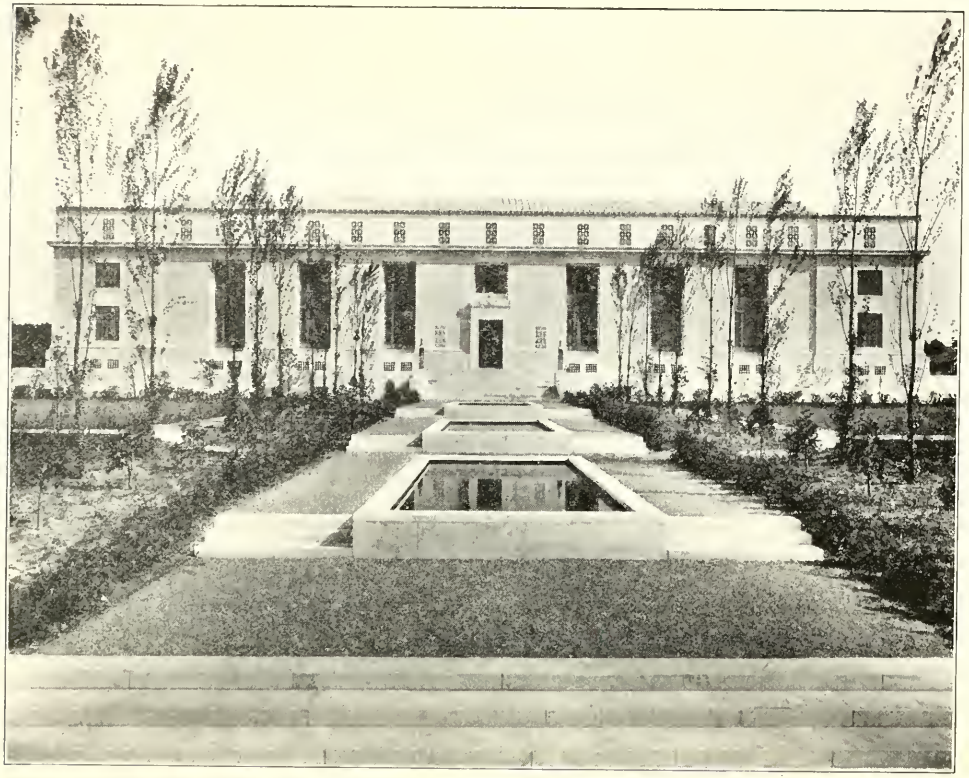
Building operations were pushed in an effort to finish construction by the fall of 1923, when it was intended that the building should be turned over to the academy and research council, but labor conditions and difficulties in securing materials delayed its completion until April, 1924.

The building was ready for occupancy before the annual meeting scheduled for April 28, 29, and 30, 1924, and the dedication program was carried out on Monday, April 28. The ceremonies were simple but impressive, with the principal address by Calvin Coolidge, President of the United States. There were also brief addresses on the National Academy of Sciences, the National Research Council, and the building, by John C. Merriam, Vernon Kellogg, and Gano Dunn. In addition to the President of the United States and members of the academy and research council, there were also present members of the Cabinet, Congress, the Diplomatic Corps, notable American scientists, contributors to the building site, and members of the Carnegie Corporation and of the Rockefeller Foundation. The architect, Bertram Grosvenor Goodhue, died suddenly in New York three days before the dedication. News of his death came as a great shock to the academy, particularly because the day before his death he had been at the building directing and clearing up details. The academy is indebted to Mr. Goodhue for his last architectural achievement, which has been referred to by the Commission of Fine Arts as one of the outstanding pieces of architecture in the District of Columbia, if not in America, and by those who knew him in his profession as one of the masterpieces of his career.

The building was opened to the public on the day following the dedication.

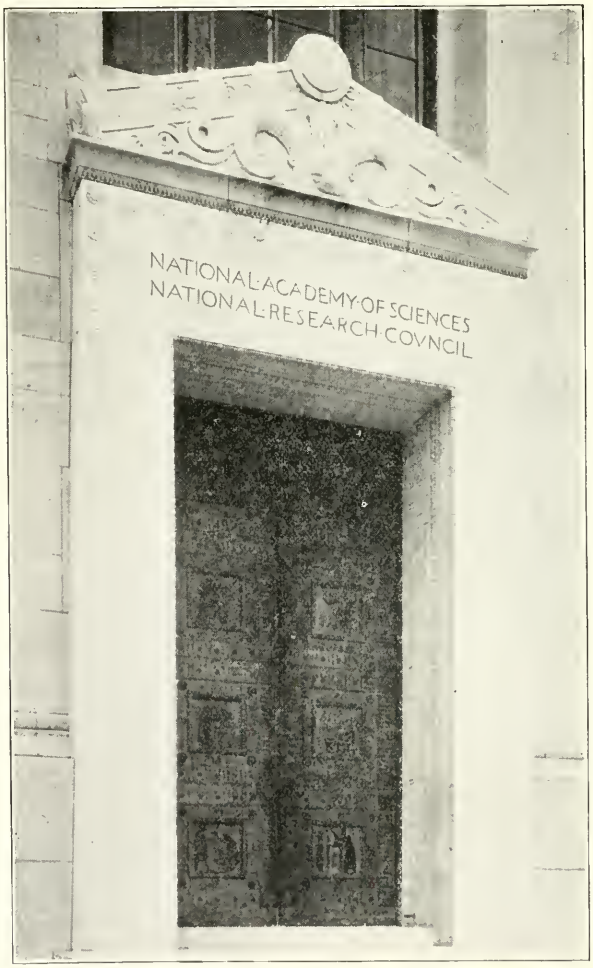
Description of Building

The general character of the building is Greek, in harmony with the Washington theme, but modern requirements made it inadvisable to adhere strictly to any historical style. The architect carried out an idea of simplicity in the design of the building itself, with rich embellishments by appropriate sculptural and mural decorations.



National Academy of Sciences. National Research Council.
Washington, District of Columbia.

The plans allow for future expansion, the fully completed building to be square. The present structure, which includes only the frontispiece and the central pavilion, will eventually be balanced by a construction at the back and two connecting wings, completing the con-



Entrance, Showing Bronze Doors Closed.

templated square. The building as it now stands has a frontage of 260 feet and is 140 feet deep. The height above the first floor is sixty feet. The building is comprised of three stories, in addition to the basement.

Upon approaching the building from the Lincoln Memorial one can appreciate the plan of the architect to carry his color scheme of copper green from the lowest shrubbery in the semiformal garden to the copper ridgepole of the roof. The three marble-trimmed reflecting pools are lined with Persian turquoise enamel tiles in harmony with this color scheme. The two lamps at the entrance of the broad stone terrace which extends across the front of the building are of verdantique marble and bronze. The six large panels filling the space between the upper and lower windows, and also the two massive entrance doors, are of green bronze.

The building itself is of white Dover marble laid in irregular courses with enough variation of grain and tone to give life to the surface.

Alternating figures of the owl and the lynx in deep relief, typifying wisdom and alert observation, compose the copper cheneau. A frieze containing the following Greek inscription is carved in the marble across the main facade:

Greek Inscription in Capital Letters

ΗΠΕΡΙ ΤΗΣ ΑΛΗΘΕΙΑΣ ΘΕΩΡΙΑ ΤΗΙ ΜΕΝ ΧΑΛΕΠΗ ΤΗΙ ΔΕ ΡΑΙΔΙΑ· ΣΗΜΕΙΟΝ ΔΕ ΤΟ ΜΗΤΕ ΑΞΙΩΣ ΜΗΔΕΝΑ ΔΥΝΑΣΘΑΙ ΤΥΧΕΙΝ ΑΥΤΗΣ ΜΗΤΕ ΠΑΝΤΩΣ ΑΠΟΤΥΓΧΑΝΕΙΝ ΑΛΛΑ ΕΚΑΣΤΟΝ ΛΕΓΕΙΝ ΤΙ ΠΕΡΙ ΤΗΣ ΦΥΣΕΩΣ· ΕΚ ΠΑΝΤΩΝ ΔΕ ΣΥΝΑΘΡΟΙΖΟΜΕΝΩΝ ΓΙΓΝΕΣΘΑΙ ΤΙ ΜΕΓΕΘΟΣ·

—Aristotle Met. A. 10:993. A. 30.

Translation

The search for Truth is in one way hard and in another easy. For it is evident that no one can master it fully nor miss it wholly. But each adds a little to our knowledge of Nature, and from all the facts assembled there arises a certain grandeur.

Ordinary Greek Text

Ἡ περὶ τῆς ἀληθείας θεωρία τῇ μὲν χαλεπή, τῇ δὲ ῥᾳδία. σημεῖον δὲ τὸ μήτ' ἀξίως μηδένα δύνασθαι τυχεῖν αὐτῆς, μήτε πάντως ἀποτυγχάνειν, ἀλλ' ἕκαστον λέγειν τι περὶ τῆς φύσεως, . . . ἐκ πάντων δὲ συναθροιζομένων γιγνεσθαί τι μέγεθος.

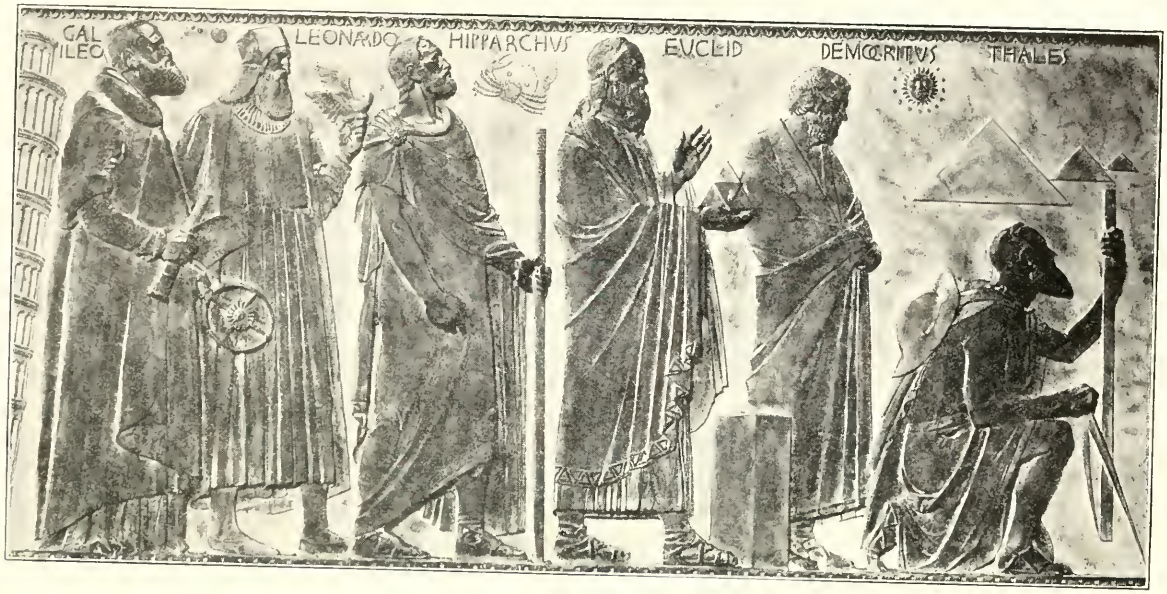
The bronze window panels depict the progress of science from Greek to modern times, by means of a procession of the great founders of science, each with some symbol of his particular field of work. Beginning with the panel on the west end of the building, the figures represented are: Galton, Gibbs, Helmholz, Darwin, Lyell, Faraday, Humboldt, Dalton, Lamarck, Watt, Franklin, Huygens, Galileo, Leonardo, Hipparchus, Euclid, Democritus, Thales, Hippocrates, Aristotle, Archimedes, Copernicus, Vesalius, Harvey, Descartes, Newton, Linnaeus, Levosier, Laplace, Cuvier, Gauss, Carnot, Bernard, Joule, Pasteur, Mendel, Maxwell. The two bronze doors at the main entrance portray eight episodes in the history of science, from Aristotle to Pasteur, and the marble pseudo-pediment above this doorway gives the sculptor's conception of the elements with which science deals—earth and cloud through the various forms of the animal and vegetable kingdoms to man, surmounted by the sun, the source of warmth and light. All of the sculpturing, both exterior and interior, is the work of Lee Lawrie.

The main floor of the building contains a central auditorium surrounded by seven exhibition rooms, library, reading room, small lecture hall, and board room.

The auditorium is reached from the main entrance through a simple vestibule and foyer screened at its beginning and end by bronze and glass grilles bearing the signs of the zodiac. It is cruciform in shape, the four arms vaulted to support a pendentive dome in the center. The vaulting is covered with acoustic tile called Akoustolith, elaborately decorated in color and gilt by Miss Hildreth Meiere. The figures in the pendentives represent the elements of the Greeks—earth, air, fire, and water. At the top of the arch soffits are the insignia of Alexandria, the great academy of antiquity, and that of the three historic national academies of Europe—the Academia dei Lincei of Rome, the Academie des Sciences of Paris, and the Royal Society of London. Encircling the dome are the following inscriptions:

> Ages and cycles of nature in ceaseless sequence moving, To science, pilot of industry, conqueror of disease, multiplier of the harvest, explorer of the universe, revealer of nature's laws, eternal guide to truth.

A striking decorative feature of the auditorium is a mural painting by Albert Herter, showing Prometheus lighting his torch at the chariot of the sun, thus bringing fire typifying knowledge) to earth



Bronze Window Panel, South Front.

for the benefit of mankind. Below this painting is an inscription from the "Prometheus Bound" of Æschylus, which cites the benefits conferred by science on the world. Just below, supporting the lintel of the north door, are two sculptured panels, Night and Day, denoting progress from darkness to light. The three galleries of the auditorium are supported by columns of verdantique marble with capitals of cream Lens stone, carved. The fronts of the galleries are of paneled walnut, inlaid.

The seven exhibition rooms surrounding the auditorium are simple in character, having been designed for practical use with no attempt at decorative features. They are equipped with hot and cold water and drain, gas, and both alternating and direct electrical current from a number of outlets, so that any kind of instruments can be operated for exhibition with very little additional preparation.

The library is on the west front of the building. The general color scheme is brought out here in the alternating green and black tiles of the stone floor, the copper lamps on the reading tables, and the bookshelves and catalogue drawers extending around the room. The center of interest in the library is the fireplace at the end of the room, with its carved overmantel representing the history of the art of writing. Three sculptured panels in the ceiling depict the discovery, the recording of the discovery, and the reading of the record.

The reading room adjoins the library on the extreme west front of the building. The walls are paneled with walnut to about two-thirds of their height, and above this wainscoating is a painted frieze, by Albert Herter, of the arms of eight historic universities: Bologna, Paris, Oxford, Cambridge, Heidelberg, Leiden, Harvard, and Yale. A seal bearing the initials NAS is carved in the handsome fireplace of Sienna marble.

The small lecture hall, on the east front of the building is designed for meeting or lectures not large enough to fill the auditorium. The platform for the speakers and presiding officers, in both the lecture hall and the auditorium, is equipped with all modern conveniences to facilitate the business of meetings and also with a laboratory table on which experiments can be actually carried out to illustrate a point. The equipment for business meetings consists of a lectern for the speaker, which can be turned in any direction and raised or lowered, shaded lights and radium clocks for both speakers and presiding officers, a red light operated by an electric push button on the presiding officer's desk to call the attention of the

speaker to his time limit, and intercommunicating telephones connected with the main switchboard, the moving-picture and lantern booths in both the lecture hall and auditorium, the speakers' platforms in both rooms, and the engineer's office. The laboratory table has a movable flat top, which conceals a sink furnishing hot and cold water, and also gas and alternating and direct electrical current. The walls of this room are paneled with walnut to about two-thirds of their height, with Akoustolith above the paneling. The walnut brackets supporting the moving-picture booth are inlaid with colored woods.

The board room adjoins the lecture hall, on the extreme east of the building. A mural decoration above the marble fireplace depicts Abraham Lincoln with the other founders of the Academy, Benjamin Peirce, Alexander Dallas Bache, Joseph Henry, Louls Agassiz, Senator Henry Wilson, Admiral Charles H. Davis, and Benjamin Apthorp Gould.

Another artistic feature of the board room is the electrolier, a globe of the world painted in accordance with Leonardo da Vinci's map dated 1515.

Unusual attention was given to the electrical fixtures and small details to make them harmonize with the larger architectural features. The door knobs and locks are of cast bronze, from models bearing symbolic designs by Lee Lawrie.

Exhibits

The exhibits in the academy and research council building are selected with a view to illustrate fundamental phenomena of nature and also the progress of scientific research. The exhibits of fundamental phenomena of nature will be more or less permanent, while those illustrating the progress of scientific research will be changed at intervals in order to show recent discoveries.

The academy proposes to have, in as many cases as possible automatic working models which can be operated by the visitor himself, thus allowing him to see not only what is accomplished, but also how the result is obtained.

Some of the permanent exhibits are those showing such phenomena of nature as the changing spots on the rotating sun, the variations in the earth's magnetic field, and the records of earthquakes wherever they occur.