NEW YORK WORLD'S FAIR 1964-1965 CORPORATION

INTERIM REPORT OF THE EXECUTIVE COMMITTEE OF THE FAIR TO THE PRESIDENT AND CONGRESS OF THE UNITED STATES SUGGESTING FOR CONSIDERATION A PLAN FOR A PERMANENT FRANKLIN NATIONAL CENTER OF SCIENCE AND EDUCATION TO HOUSE THE UNITED STATES EXHIBIT AT THE FAIR

December 5, 1960

INTRODUCTION

In order to facilitate action on the vitally important United States Exhibit at the World's Fair, the executives and directors of the Fair invited distinguished consultants to prepare a plan of federal participation which would provide a focal center, symbolize the basic theme and purposes of the Exposition, serve as a guide to other American exhibits illustrating the progress our nation has made, and serve as the nucleus of a permanent Franklin National Center of Science and Education paralleling in this field the area of culture represented by the Lincoln Center for the Performing Arts at Lincoln Square.

All signs point to a superlative Fair at Flushing Meadow. It seems certain that exhibitors, domestic and foreign, industrial and cultural, will send to us the very best they have to offer. It becomes vital then that in the worldwide competition of ideas and practical accomplishments, our central, pivotal, national exhibit shall not, through lack of imagination and financial support, be outclassed by others. The United States Government exhibit should present graphically and convincingly in impressive surroundings the immense strides we have made under our free democratic system.

The distinguished savants whom we consulted on this plan were:

In Science:

Dr. Detlev W. Bronk, President of the Rockefeller Institute and of the National Academy of Sciences-National Research Council.

Dr. John R. Dunning, Dean of Engineering, Columbia University.

Dr. Lloyd V. Berkner, President, Associated Universities, Inc.

Dr. William L. Laurence, Science Editor, The New York Times, Chairman.

In Education:

Dr. John H. Fischer, Dean, Teachers College, Columbia University.

Dr. John W. Gardner, President of the Carnegie Corporation of New York and of the Carnegie Foundation for the Advancement of Teaching.

Dr. Fred M. Hechinger, Education Editor, The New York Times.

Dr. Joseph E. Johnson, President, Carnegie Foundation for International Peace

Dr. George N. Shuster, Past President, Hunter College, Chairman.

We have taken the liberty of including in this interim report very preliminary graphic illustrations of the plan we suggest and a rough estimate of cost.

It is unnecessary to add that the location and character of this key federal exhibit are of urgent importance because they affect and influence many other features of the Fair which are advancing rapidly.

ROBERT MOSES

President

SCIENCE EXHIBIT

Your committee is unanimously agreed that the United States exhibit "involving primarily our scientific accomplishments and our expectations for the near future" should be the outstanding exhibit at the Fair. It should be the finest of its kind, fully commensurate with the greatness of America, not only as the country in which free men attained the highest technological development and the highest standard of living of any nation in history, but also as the country in which science has made possible the evolution of a free society in which every man achieved the highest dignity and stature as an individual, with the greatest opportunities ever for the full development of his physical, intellectual, spiritual and creative potential.

Not only has science made possible in the United States the highest form of a free society, in which every individual has an equal opportunity to realize to the fullest extent all the innate potentialities of his endowment, it is now playing the central role in the all-important task of defending our free society against the greatest threat in its history. A science exhibit officially sponsored by the leading nation of the free world must make it clear to all the world that in the great war of ideas we are now engaged, our greatest defensive weapons are not atomic and hydrogen bombs but the mind of man functioning in a climate of individual freedom.

While a United States science exhibit should, understandably, "involve our scientific accomplishments" it should not limit itself merely to our own accomplishments. Fundamental scientific discoveries, upon which our great technological achievements are based, have largely been made by scientists of the free Western democracies, mainly Britain, France, Germany, Italy and the Scandinavian countries. Our modern industrial civilization began with the steam engine, invented by an Englishman, who made use of basic laws of mechanics discovered by Galileo, an Italian, and Newton, an Englishman. Newton's fundamental discoveries have, in fact, laid the foundation for all the great contrivances of the Machine Age. The principle of electromagnetic induction, which made possible the dynamo and ushered in the Age of Electricity, was discovered by Faraday, an Englishman. Another Englishman, Sir J. J. Thomson, discovered the electron, the basis of all the marvels of electronics — radio, television, radar, automation, rocketry, satellites, etc. Roentgen, a German, discovered the X-ray, one of the most powerful tools to penetrate the mysteries of matter, as well as a powerful weapon in the diagnosis and treatment of disease. Becquerel, a Frenchman, discovered radioactivity, which opened the door to the Atomic Age. Rutherford, an Englishman, discovered the nucleus of the atom, citadel of the material universe, while another Englishman, Chadwick, discovered the neutron, which opened the way to nuclear fission, discovered by Otto Hahn, a German. Pasteur, a Frenchman, discovered the bacterial origin of infectious disease and laid the foundation for modern immunology, which revolutionized medicine and public health. Fleming, an Englishman, discovered penicillin, which opened the way for the antibiotics that have so far saved more lives than were lost in both world wars. Mendel, an Austrian monk, discovered the laws of heredity and laid the foundation for modern genetics.

It is these fundamental discoveries, made by men seeking knowledge for the sake of knowledge per se, without any thought of its possible practical application, that have opened the way for all our own scientific accomplishments, which, in turn, have made possible our way of life. Hence it is obvious that a United States exhibit must, first of all, be a history of ideas, showing how the inquisitive mind of man, given full scope in an atmosphere of intellectual freedom, has, over the centuries, and particularly since the advent of free institutions, managed to make nature yield some of her most important secrets, and how these triumphs of man's free mind have, in turn, made it possible for all free men, and particularly the American people, to harness the forces of nature to build a better life in an environment vastly more suitable for man's needs, material, as well as spiritual.

All the aforementioned fundamental discoveries, and many others in the fields of astronomy, physics, chemistry, biology, genetics, geophysics, medicine, agriculture, metallurgy, etc. upon which all our modern technological civilization is based, should form important parts of the United States exhibit. By taking advantage of all modern techniques of presentation — color motion pictures, television, transparencies, revolving stages, with prominent scientists taking part in the demonstrations, either in color

motion pictures or in person, such exhibits could be made not only highly instructive, but highly dramatic and entertaining as well.

There is no greater thrill than that of the naked mind of man, with or without simple tools, challenging nature to yield up some of her important secrets, and coming out triumphant after overcoming apparently insuperable obstacles. The intellectual and spiritual exaltation, the religious awe, that must have overcome Newton when he discovered the Law of Gravitation; the ecstasy experienced by Einstein when he discovered the principle of relativity (he was so overcome that he actually took to bed for two weeks); the joy of Pierre and Marie Curie the night they first saw the eerie light of radium in the abandoned cadaver shed, after four years of back-breaking labor, to take but a few examples at random, could be made to live again in the minds and hearts of the spectators at the exhibit, through dramatic re-enactments of the original scenes.

Such exhibits will dramatically demonstrate the following fundamental points:

1. All modern technology has its origin in fundamental discoveries made by inquisitive minds seeking knowledge of nature.

2. While pure science seeks only knowledge, without any thought of practical application, every scientific discovery eventually leads to far-reaching technological developments for the improvement of man's lot on earth. Technology, in turn, gives science new tools that make possible further fundamental discoveries.

3. All major discoveries in science have led to further enhancement of the democratic way of life.

4. Conversely, the democratic way of life creates the best environment for the creative mind. This is particularly true in the development of science and technology.

Without in any way resorting to propaganda, the exhibit, as outlined, will make it clear that not one of the major discoveries mentioned has come from either Czarist or Communist Russia, or from Nazi Germany, or from any other country without democratic institutions. The only major technological development in Nazi Germany, the V-2 — the first practical rocket — was based on principles developed by the American, Robert Goddard, whose basic ideas were also lifted bodily by the Russians in the development of their sputniks. In fact, all of Russia's technological progress is based on fundamental scientific discoveries and technological developments made in the free world, their technological development being largely based on the technology of the United States.

All the aforementioned lead your committee to the following conclusions:

1. The United States Scientific Exhibit should be the finest of its kind, exceeding in scope the outstanding examples of equivalent institutions anywhere in the world — such as the Deutsches Museum in Munich or the Palace of Discovery in Paris. It should, in fact, aim to become one of the wonders of the modern world, fully representing the spirit of America and commensurate with its greatness as the leader of the free world. Properly planned, it could serve as an expression of our faith in the future, as a potent weapon in the war of ideas. In the present fateful struggle between the concepts of a free society and totalitarian enslavement we cannot afford second best.

2. Such an institution must, obviously, become a permanent part of our cultural heritage. It must be housed in a monumental building that in itself would represent one of the finest structures of its kind in the world, one that would stand as a symbol of the modern free world in the same manner as the great cathedrals of Europe symbolized the aspirations and the faith of their builders and of the peoples of their day.

3. We believe that such an exhibit, and the structure in which it is housed, requires a minimum of seven acres, including exterior landscaping. A central location is desirable, as the United States Science Exhibit should be at the center of the Fair, the hub from which all other exhibits radiate. Such a central location, we believe, will enhance the value of, and interest in, all other technological exhibits to be presented by our leading industrial organizations, the technologies of which are the results of basic discoveries in science. The United States Science Exhibit would serve as the background that will make all these industrial exhibits more understandable, and hence more attractive.

The structure housing the United States Exhibit

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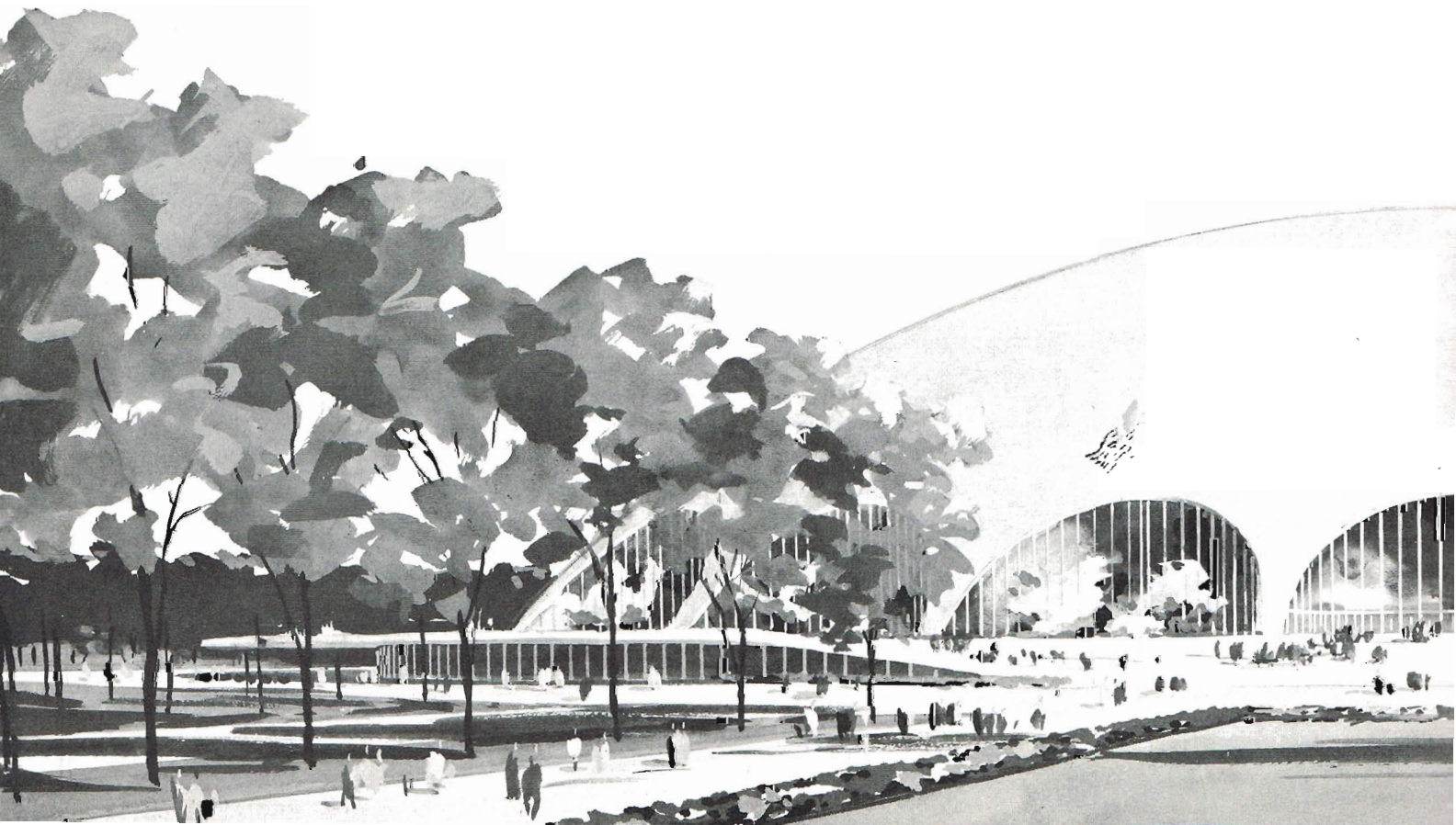
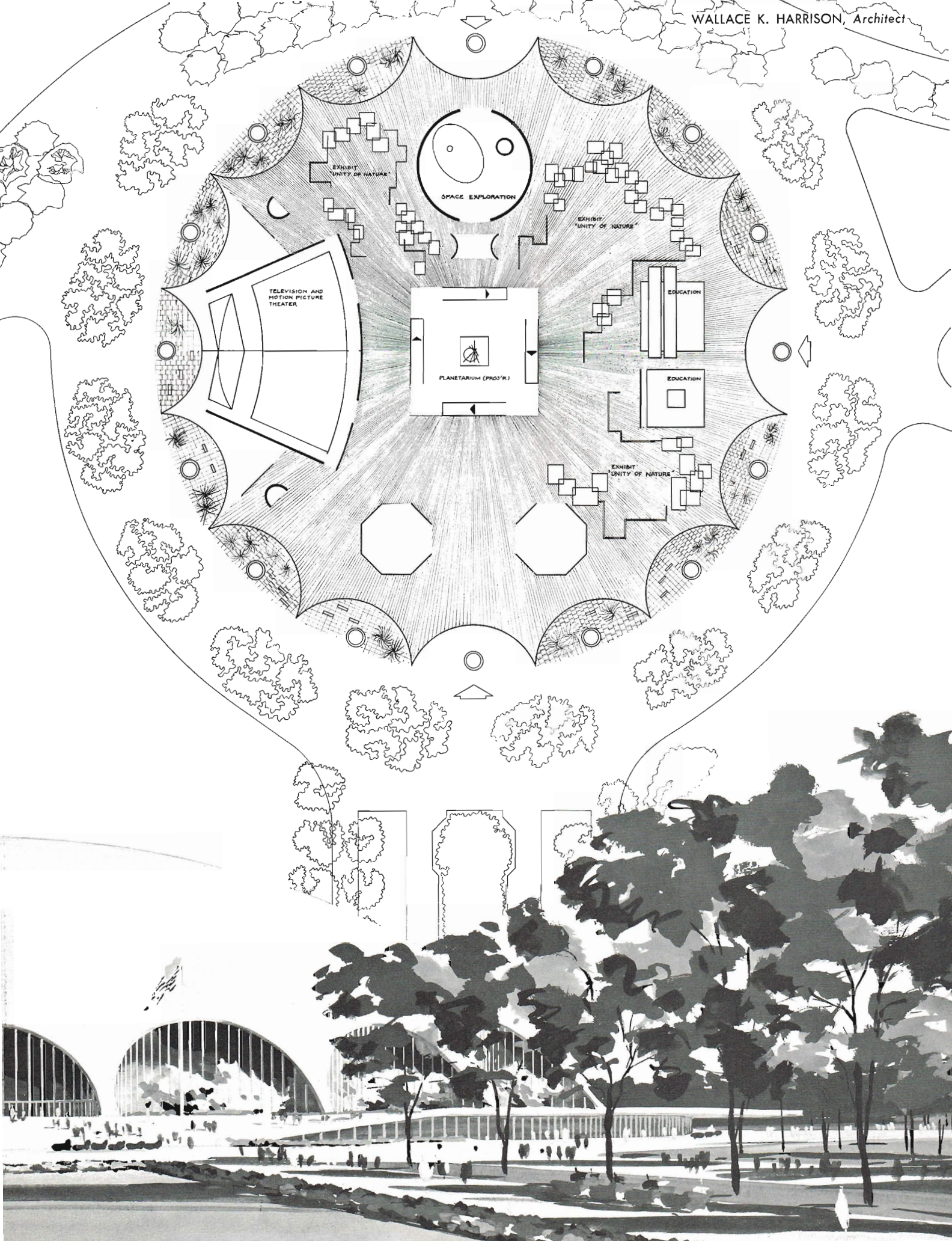


WALLACE K. HARRISON, *Architect*



should in itself be a most dramatic exhibit, a dynamic symbol of the world of the future, showing the creative mind of America at its best in one of its most original aspects. The preliminary sketches for the proposed building were prepared by Wallace K. Harrison.

After careful consideration, your committee has come to the further conclusion that a United States Science Exhibit of the dimensions outlined above would require an appropriation by the Federal Government of $30,000,000 — $20,000,000 for the building and $10,000,000 for the exhibits it would house.

The institution on Flushing Meadow must not be a museum of static displays, but a living dynamic institution, a great cultural center, designed to instruct, to enrich and to inspire all those who visit it, young and old, university graduates and those of no more than a grammar school education. It should instruct and at the same time entertain. This great Center of Science and Technology, as we prefer to call it, should be the equivalent of a great National Theatre, in which the leading actor is the human mind, groping and struggling through the ages to learn the secrets of nature and to make man at home in an orderly universe.

The Center would thus be above all a revolutionary type of educational institution as well as a new form of entertainment. Like a great repertory theatre, it should schedule special programs, daily or weekly, so that a visitor having once come to it will want to visit it again and again and will tell his friends to do likewise. It would serve as a model for similar institutions in all other cities throughout the country as well as in other parts of the world. It could become a major attraction for conventions and tourists, one of the showpieces of America.

As already stated, the Center should take advantage of all modern techniques of presentation, color motion pictures, television, revolving stages, etc. Motion pictures in color should present in dramatic form the story of the major discoveries of the fundamental laws of nature upon which all our modern technology is based. The emphasis in all these should be not on the "what?" but on the "how?", the manner in which an idea emerged, not infrequently over the course of centuries or millennia.

The exhibit should aim to give the average person an outline of man's knowledge of the universe, the infinite and the infinitesimal, the living and the nonliving, and how this knowledge was acquired. The motion pictures and lectures by eminent scientists should serve to provide the background for actual demonstrations showing the mind of great men in action.

These demonstrations should be associated with personal participation on a do-it-yourself basis, with the visitor himself performing some of the crucial experiments that represent landmarks in the growth of ideas. The visitor could be taught to weigh the earth, the moon and the sun; to measure the velocity of light; and to determine on his own the distance from the earth to the sun. Repeating the experiment of Galileo, the visitor could rediscover for himself the law of falling bodies; he could discover helium in the sun and determine what other elements the sun is made of; he could repeat Faraday's simple experiment that led to the Age of Electricity, and the epoch-making experiment by Hertz, in which he created the first man-made electromagnetic wave, which ushered in the age of radio, television and radar. These are only a few examples in which the average person could be initiated into the fellowship of the great discoverers through the ages.

Rather than being lost in a maze of detail, the exhibit should stress the unity of nature and the fundamental laws that govern it. It should be built around several great general exhibits, all interrelated. One of these should give the visitor a comprehensive view of the cosmos at large, the universe of stars, galaxies and supergalaxies. Another should give the story of the solar system and of the earth. The story of matter and energy should be the subject of a third. Another general exhibit should be devoted to the story of the evolution of life on earth and the possibility of its existence elsewhere in the universe. The nature of life and how it functions, with emphasis on human development and physiology, should be the subject of another. An exhibit showing how a humble monk, Gregor Mendel, observing his peas in his garden, discovered the laws of heredity operating throughout the entire realm of life, from the lowest of bacteria to man, should be the starting point for an exposition of the story of genetics.

All these great exhibits, however, should merely

serve as the background for the story of America's contribution to science and technology, from colonial times to the present. It should show how, building on the discoveries of the past, the American creative mind transformed a virgin continent into a New World which offered the greatest opportunities for the individual to grow in freedom and to attain the highest standard of living in history.

The exhibit should constitute a great pageant of the great names in American science and invention — Franklin, Eli Whitney, Joseph Henry, Fulton, Morse, Bell, Willard Gibbs, Michelson, Millikan, Edison and Tesla, to mention but a few. It should show America's great contributions to the development of the telegraph and the telephone, the automobile, radio, television, and radar; the airplane, the helicopter and the jet plane; its contributions to the science of nutrition, to medicine and to surgery, to agriculture and transportation, to the harnessing of great rivers, such as the Niagara and the St. Lawrence, with scale models of these giant dams.

Two of the major exhibits of American technology should, of course, show our country's outstanding contributions to the Atomic Age and the Age of Space. The atomic exhibit should show the highlights of the great secret wartime development that brought the Atomic Age into being. It should show, among others, a model of the first nuclear reactor built in the squash court at the University of Chicago, the first atomic power plant in history. It should be climaxed with an actual experimental swimming pool type of nuclear reactor, of the type shown by the United States at the United Nations Conference on the Peaceful Uses of Atomic Energy in Geneva in 1955. Such a reactor is absolutely safe and is highly spectacular. The exhibit should also illustrate the great promise of atomic energy as a vast new source of energy for industrial power, and as a most important tool in agriculture, biology, and medicine, which promises to play a major role in the conquest of disease and the prolongation of life.

The exhibit on the Space Age should, first of all, provide a clear explanation of the fundamental principles of the rocket and the principles that maintain a satellite in its orbit. It should display models of the various American satellites placed in orbit, their instrumentation and their purpose. It should also leave room for any new satellites and new discoveries that will be made after the exhibit had been set up.

In addition to providing a comprehensive outline of scientific discoveries and technological developments up to the present, the Fair should also provide a glimpse of the immediate and the more distant future. It should show how atomic energy promises to give mankind everywhere an abundant source of energy for an abundant life, and how that will serve as a vital factor in bringing peace to the world. It would show mankind entering an era in which most major diseases will be eliminated and the average lifespan will be significantly increased.

It should also show that, within the next two decades or so, scientists hope to solve the problem of harnessing the fusion energy of the hydrogen bomb as a limitless source of industrial power, with the oceans of the world providing an endless source of fuel.

Lastly, it should provide a glimpse of what further explorations of outer space will bring in the future. Such a glimpse will make the onlooker aware that we stand on the eve of some of the greatest discoveries ever made, discoveries that may open vast new horizons for mankind.

The exhibit as a whole must avoid giving the impression that science and technology are purely materialistic. Science is the outgrowth of the spirit of man, of his desire to know, to seek the truth. Its technological fruits serve to make man free from exhausting physical labor, to enable him to cultivate his spiritual and creative powers, in short, to make him free. An understanding of science should therefore give us faith in the future, for science, by fostering the free mind, is the greatest enemy of totalitarianism. The old maxim; "And ye shall know the truth and the truth shall make you free" is still as valid as it ever was.

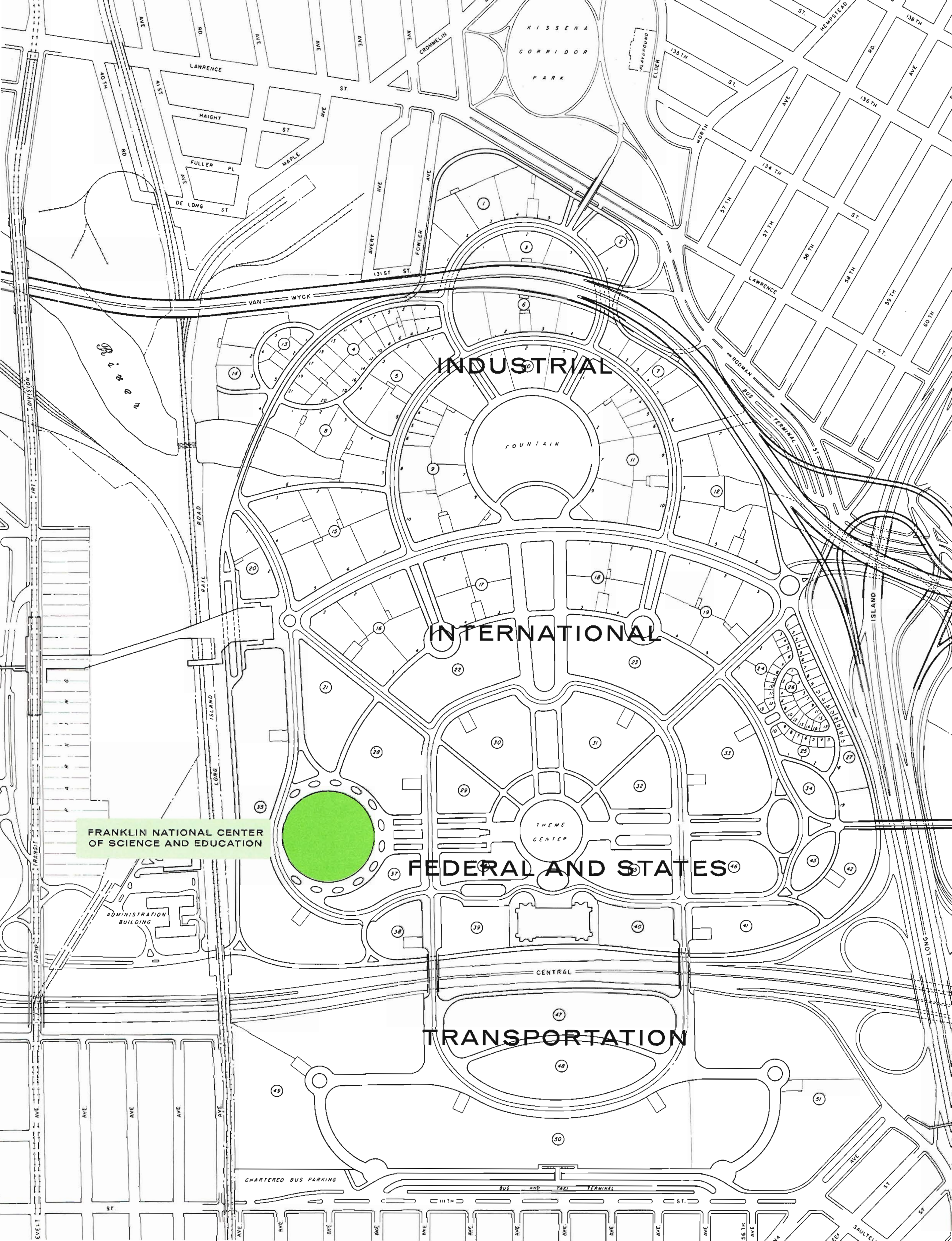
Respectfully submitted

DETLEV W. BRONK

JOHN R. DUNNING

LLOYD V. BERKNER

WILLIAM L. LAURENCE
Chairman



KISSENA CORRIDOR PARK
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THEME CENTER
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FRANKLIN NATIONAL CENTER OF SCIENCE AND EDUCATION
ADMINISTRATION BUILDING
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CHARTERED BUS PARKING
BUS AND TAXI TERMINAL
VAN WYCK
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NEW YORK WORLD'S FAIR 1964-1965

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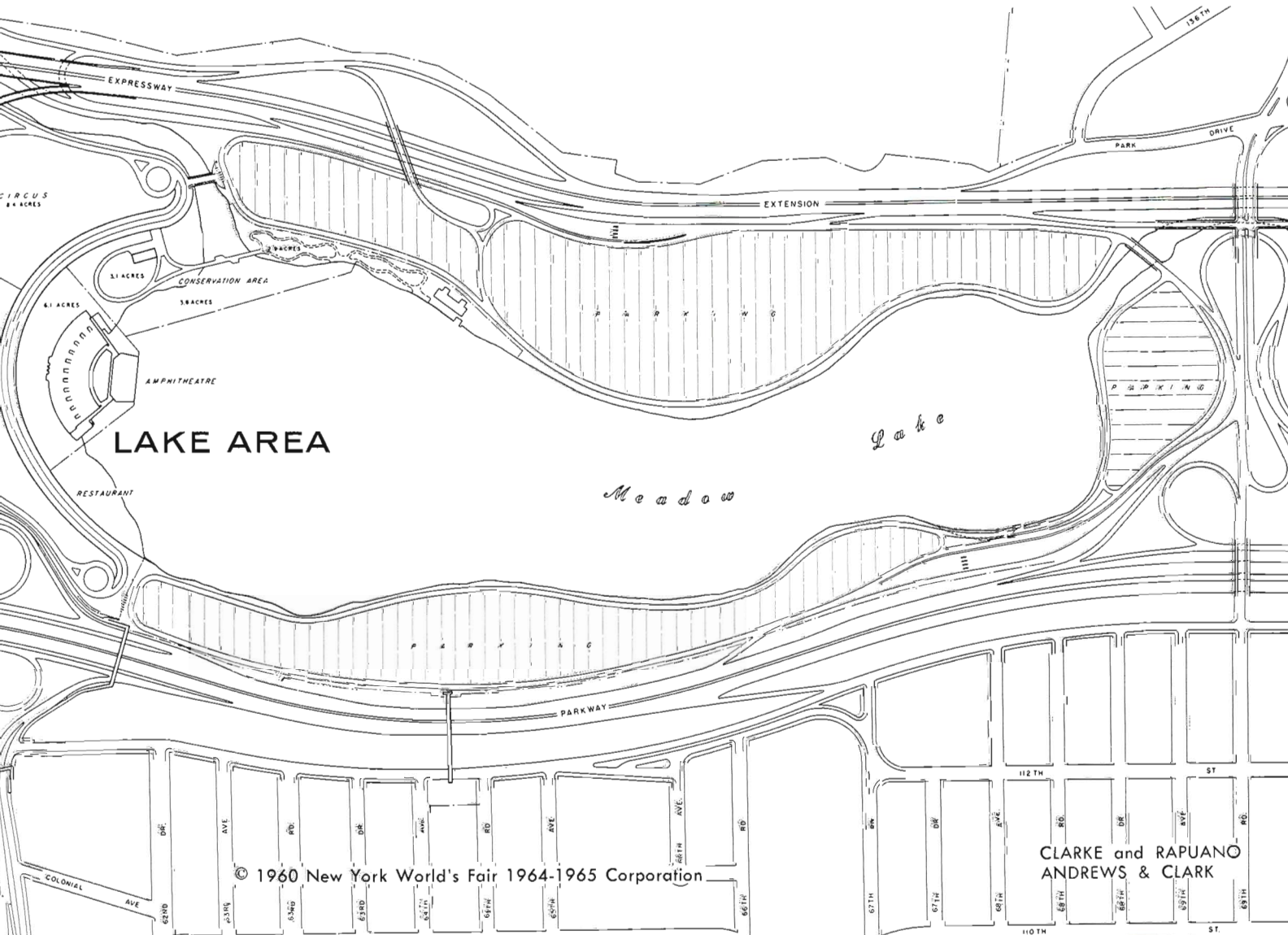
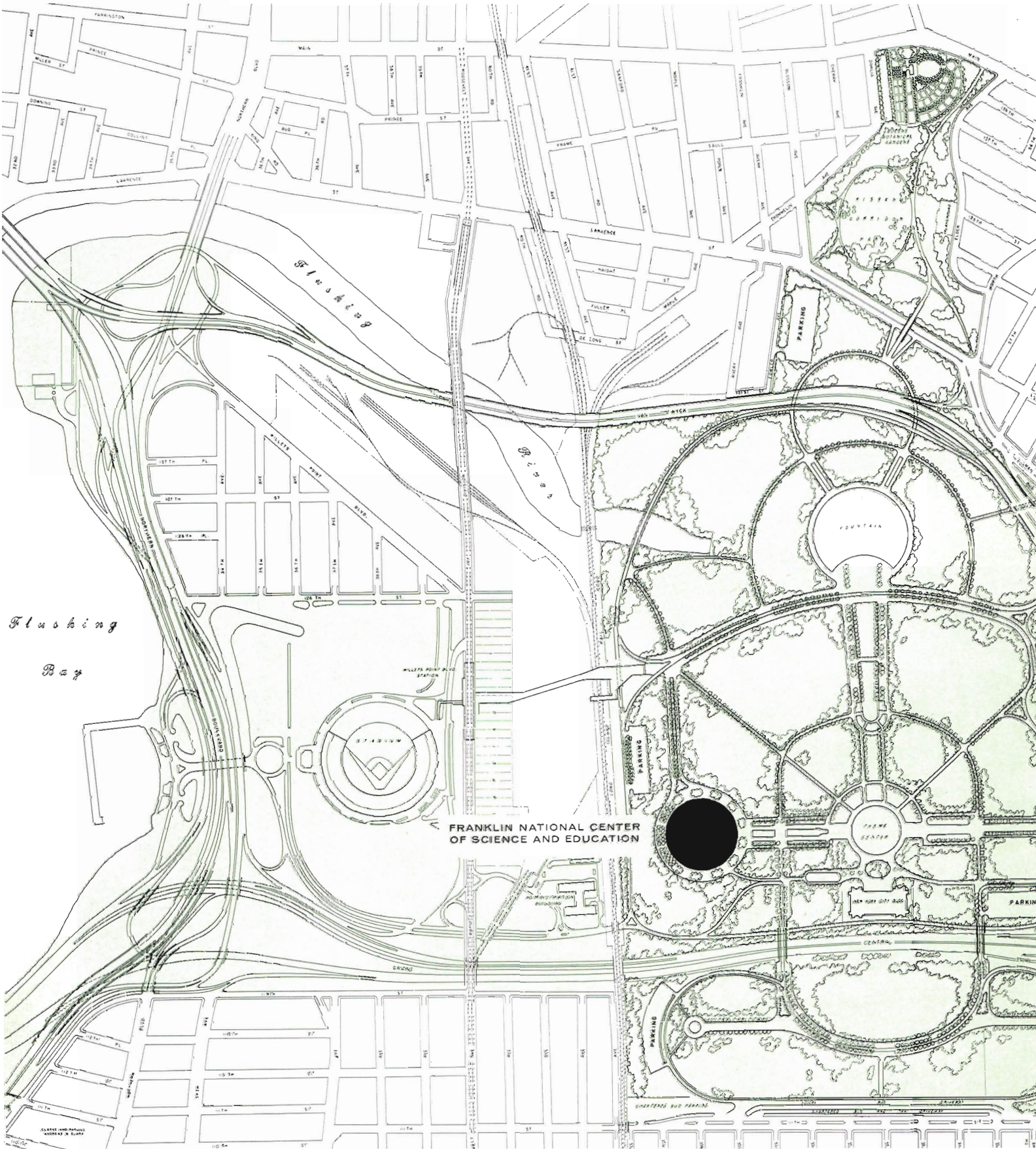
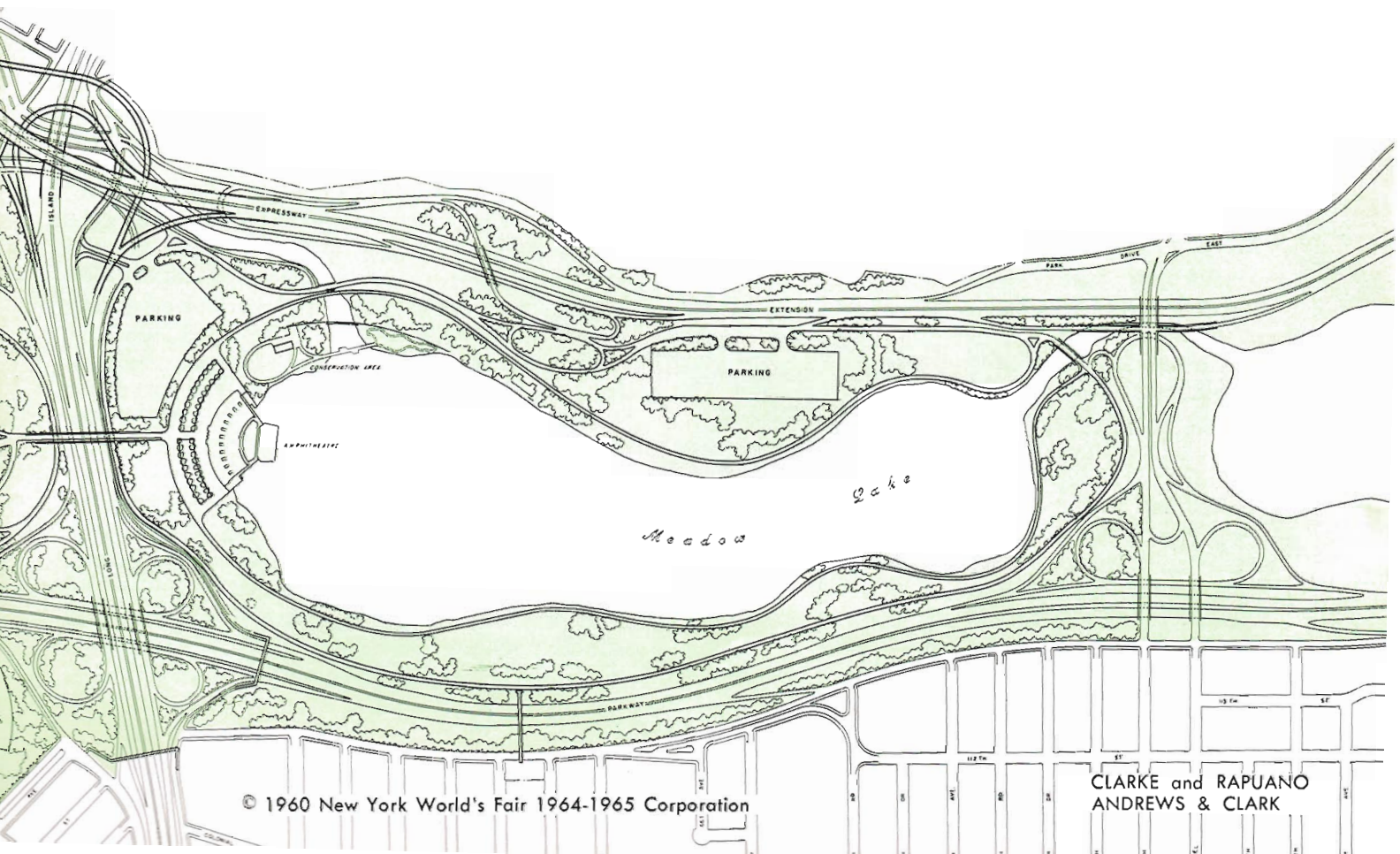


CLARKE and RAPUANO
ANDREWS & CLARK


Flushing
Bay
FRANKLIN NATIONAL CENTER
OF SCIENCE AND EDUCATION

FLUSHING MEADOW PARK AFTER FAIR



CLARKE and RAPUANO
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ADDENDUM TO THE REPORT OF THE SCIENCE COMMITTEE

EDUCATION EXHIBIT

As stated in the report of your Committee on the United States Science Exhibit, the National Center of Science would "be above all a revolutionary type of educational institution as well as a new form of entertainment."

On further consideration, and in the light of the valuable report of the Committee on Education headed by Dr. George N. Shuster, and including Dr. John H. Fischer, Dr. John W. Gardner, Dr. Fred M. Hechinger and Dr. Joseph E. Johnson, it appears that the educational potentialities of such a Center would be greatly enhanced by the incorporation of a special exhibit that would tell in dramatic form, *largely through color motion pictures and closed circuit television,* the inspiring story of the development of the American educational system, from the beginning to the present, with a glimpse into the future.

Such an exhibit would *not require a special building,* as one large hall, in the form of an attractive and spacious auditorium, equipped with a modern stage and screen and decorated with murals giving the highlights of the story of education in America, would adequately serve the purpose. Such a Hall of Education should form an integral part of the Science Building. The Center could thus be named the "Franklin National Center of Science and Education."

The educational section of the Center should *avoid any semblance of static museum-type exhibits.* The development of the educational system in America is one of the glories of our land, a story of great human interest that can be told in colorful and dramatic sequences in which the highlights covering a period of more than three centuries could be re-enacted and made to live again. The story should tell how from the very beginning the "things" our forefathers "longed for, and looked after was to advance learning and perpetuate it to our posterity." It should tell not only the American people but the peoples from all parts of the world who will visit the Fair, and in the years to come, that the ideal of universal education for all, and not only for the privileged few, was fostered in our country from the beginning; that this ideal became a keystone of our democratic way of life, which gives every individual an equal opportunity to develop to the fullest possible extent all the innate talents within him. It should show that only in America has this ideal been fostered, and is still being fostered, not for the purpose of creating robot-like servants of the State, but to give every individual an equal opportunity to rise to his highest dignity as an individual; to give life a higher meaning; to inspire to the fullest measure a devotion to the higher values of existence; to instill in every citizen love of God, of country and of his fellow men.

The spirit of American education, that might well be expressed in an inscription on one of the walls of the proposed Hall of Education, could best be illuminated by the inspiring passage from New England's First Fruits, published in 1643, telling the story of the founding of Harvard College in 1636, a bare sixteen years after the landing of the Pilgrims:

"After God had carried us safe to New-England, and wee had builded our houses, provided necessaries for our liveli-hood, rear'd convenient places for Gods worship, and settled the Civil Government: One of the next things wee longed for, and looked after was to advance Learning and perpetuate it to our Posterity; dreading to leave an illiterate Ministery to the Churches, when our present Ministers shall lie in the Dust.

"And as wee were thinking and consulting how to effect this Great Work, it pleased God to stir up the heart of one Mr. Harvard (a Godly gentleman and a lover of learning, there living among us) to give the one half of his Estate (it being in all about 1700 £) towards the erecting of a Colledge; and all his Library: after him another gave 300 £. Others after them cast in more, and the publique hand of the State added the rest; the Colledge was, by common consent, appointed to be at Cambridge (a place very pleasant and accommodate) and is called (according to the name of the first founder) Harvard Colledge."

This inspiring story could well be dramatically re-enacted in a color motion picture, to be written by one of our leading dramatists. The film would show the Pilgrims in solemn conclave at a Town Meeting which may well have followed the funeral of one of their ministers. They would be shown discussing the need for the advancement and perpetuation of learning, revealing their "dread of leaving an illiterate ministry," and their despair because of the lack of funds with which to accomplish their purpose, when a young minister among them, John Harvard, rises to announce his magnificent gift.

The story could then go on to tell the early struggles of the young college for survival, how the students paid their tuition with products of the farm — cheese, milk, eggs and vegetables, which the faculty lived on. It could show actual classrooms of the 17th Century, the methods of teaching, student life, their games and their pranks. The story could unfold the role played by Harvard in the Revolutionary War, in the Civil War, in World War I and II. Leading actors could re-create some of the great teachers and personalities of Harvard during its three centuries, making them live again in their classrooms. Interwoven through the story should, of course, be the landmarks showing the growth of Harvard from a tiny "Colledge" of one small building to one of the world's great institutions of learning, with outstanding graduate schools in Medicine, Law, Business, the Arts, the Sciences and the Humanities.

Similar inspiring, intensely dramatic stories could be told of our other great universities — Yale, Princeton, Columbia, to mention but a few. Many of these dramatizations already exist. For example, during its recent fund drive, Harvard produced a splendid motion picture, "From the Age that is Past," shown so far only to a limited audience of alumni, which should prove highly interesting to the public at large.

Another dramatic and colorful story could be told of the development of our great Land-Grant colleges and universities, showing President Lincoln signing the Land-Grant Act in 1862 and explaining its purpose; the development of our great State Universities; the establishment of our great institutions of learning for women; the world-famous institutes of technology, such as M.I.T. and Caltech; our great research centers, such as the Rockefeller Institute; the unique Institute for Advanced Study, at Princeton; our gigantic National Laboratories, serving groups of universities, at Brookhaven, N. Y., Oak Ridge, Tenn.; and Argonne, near Chicago.

By means of closed circuit television, the visitor at the Center would be permitted to enter classrooms in several of our leading universities, showing education in action. He could be made a participant in some of the students' extra-curricular activities, watch rehearsals and actual performances of their dramatic societies, debating teams, glee clubs. He could sit-in at a typical "bull-session" among undergraduates and made to feel as one of them.

One of the special features of the education exhibit could be a re-enactment of some of the memorable football games of the past, bringing back to life, or restore the youth of, some of the legendary names in football history. This feature of the exhibit should, of course, show present day athletic activities, illustrating the fact that American education is designed to meet the needs of the whole man, body, mind and spirit.

A major part of the exhibit should be devoted to a dramatic presentation of the development of the elementary school, the high school and the kindergarten, with living subjects playing their respective parts in the proper environment. This group of exhibits, all in color motion pictures, should bring back to life the original red school house, with all the trimmings. It should show the teachers and the children in the dress of the period, and the manner in which the three R's were taught. It should graphically depict how this little red school house gradually developed over the years into the modern elementary school and high school. These exhibits also should show typical classrooms in action, with living actors playing the part of the teachers and real children acting as the pupils. Whenever possible actual modern classrooms should be entered by means of closed circuit television.

One of the major aims of this exhibit would be to illustrate the development of the art of teaching from its crude beginnings to its modern advanced techniques. This could be done by showing classrooms at various periods in our history and the methods used in teaching certain subjects.

The exhibit could be climaxed with a present-day version of the meeting of the Pilgrims that led to the founding of Harvard. In the modern version we would have (in color motion picture) a group of distinguished educators, including the presidents of a number of our leading institutions of learning, expressing their fears for the future and affirming once again that "the things we long for, and look after, is to advance learning and perpetuate it to our posterity." In this sequence should be outlined, in the words of the educators, the great problems now facing American education, stressing the fact that we are now engaged in a fateful struggle for survival that requires the training of our best minds, through a system of universal education designed to meet effectively the great challenge of our day.

Respectfully submitted

WILLIAM L. LAURENCE

Chairman, Science Committee.