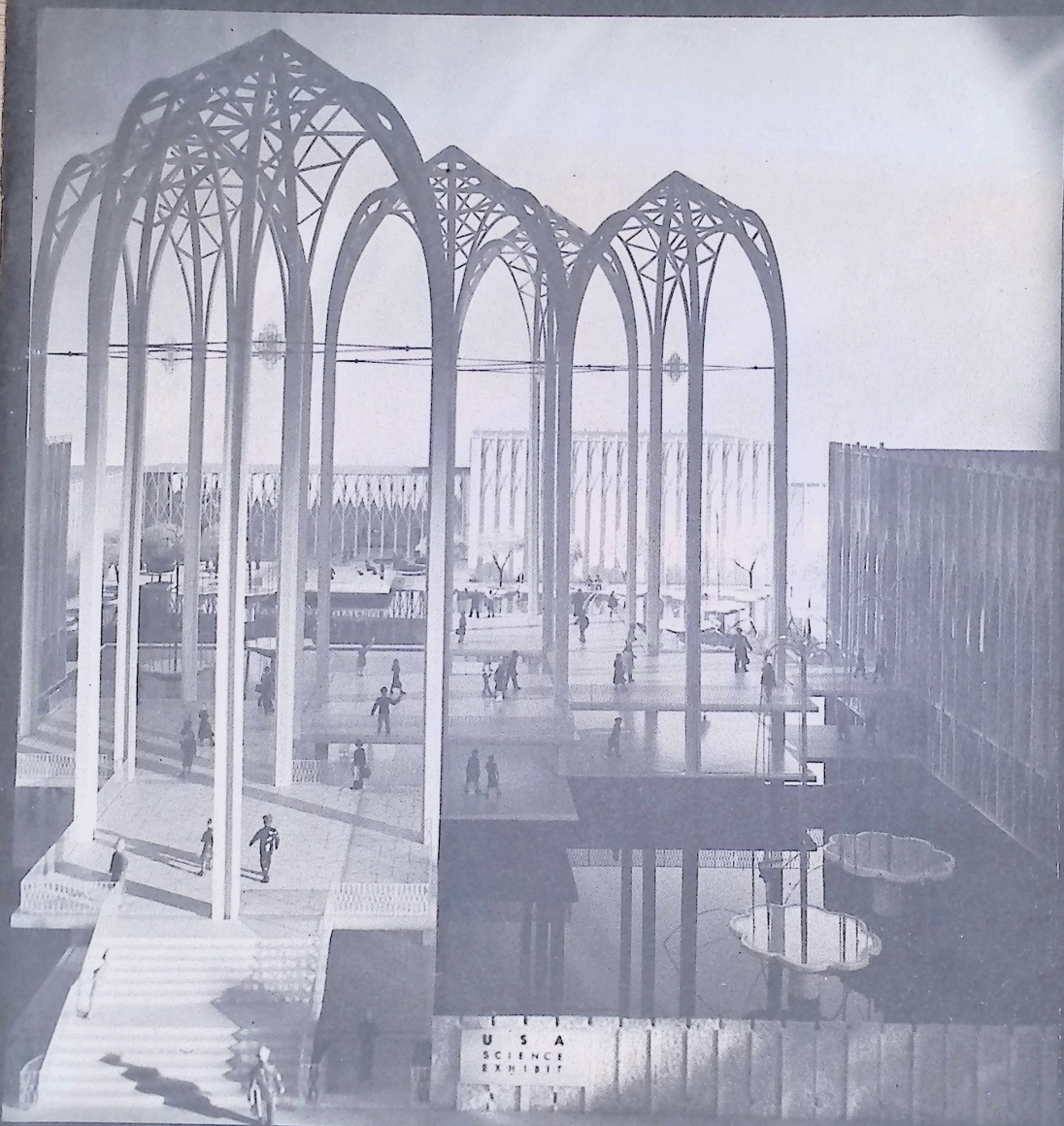
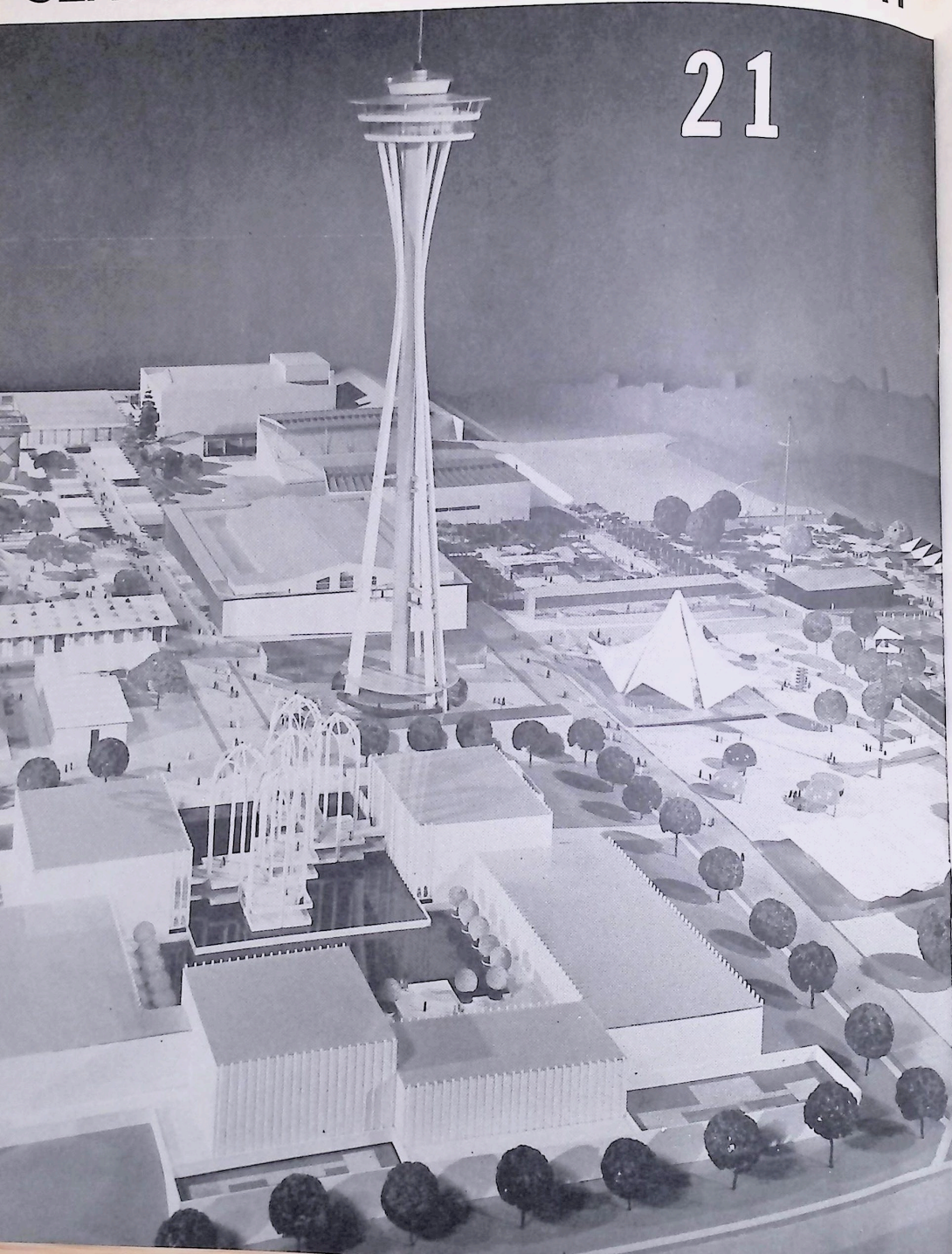


UNITED STATES SCIENCE EXHIBIT



SEATTLE WORLD'S FAIR
CENTURY 21 EXPOSITION APRIL-OCTOBER 1962
United States Department of Commerce



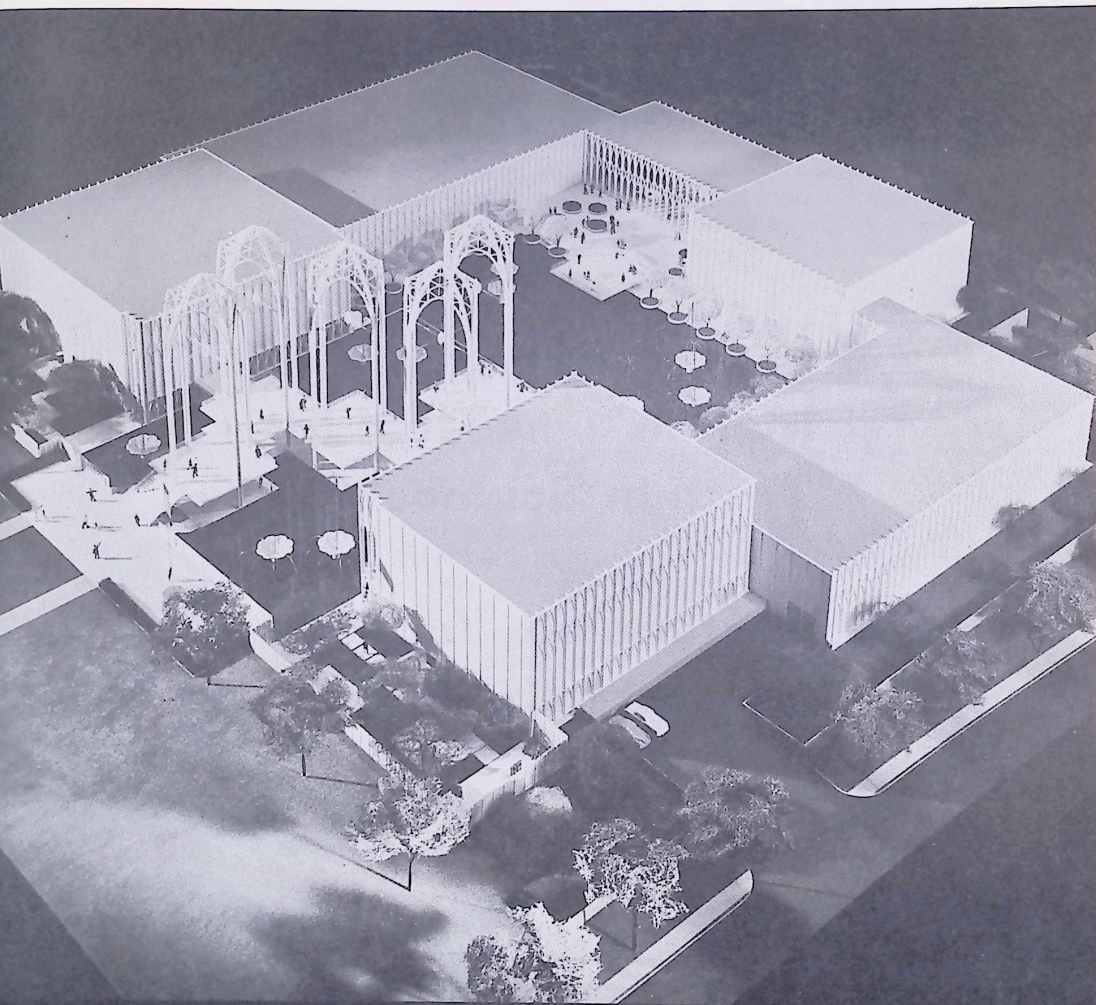
A preview of how man will live, work and play in the year 2000, the Seattle World's Fair will be composed of "The Five Worlds of Century 21".

- * THE WORLD OF SCIENCE - The United States Science Exhibit
- * THE WORLD OF CENTURY 21 - International exhibits projecting man's future way of life
- * THE WORLD OF COMMERCE AND INDUSTRY - 23 acres of exhibits representing domestic and international trade
- * THE WORLD OF ART - set aside for presentations from the great art collections of the world
- * THE WORLD OF ENTERTAINMENT - to feature international performing arts, sports, recreations, amusements and restaurants

THE UNITED STATES SCIENCE EXHIBIT WILL BE PRESENTED IN a permanent Pavilion, consisting of six buildings, designed by Minoru Yamasaki.

The Pavilion will occupy 6 1/2 acres of the Century 21 Exposition's 74-acre site, located within one mile of downtown Seattle.

UNITED STATES SCIENCE PAVILION



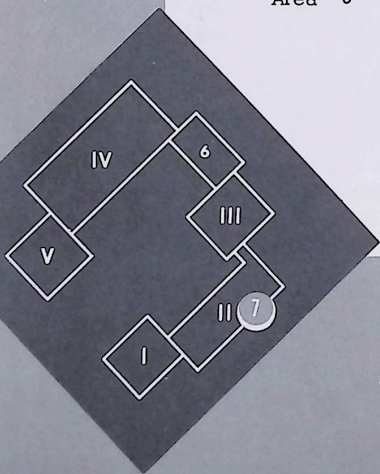
● **THE AIMS OF THE
UNITED STATES
SCIENCE EXHIBIT**

- ▼ **to present the role of
Man in his search for
Truth in Science . . .**
- ▼ **to stimulate Youth's
interest in Science.**

THE THEME OF THE UNITED STATES SCIENCE EXHIBIT

Science has shaped our civilization to a degree beyond all calculation. To see science as a constant search for knowledge and a continuing improvement of methods of verifying what we know about man and his universe, the visitor will pass through five major areas and two specialized sub-areas. Entering through the inspiring arches, which designer Minoru Yamasaki calls "Space Gothic", the visitor will enter:

- Area I The House of Science - a film that will introduce and explain the general philosophical framework in which all scientists must work, and work best.
- Area II Development of Science - exhibits which show the evolution of science from man's earliest curiosity about the phenomena of nature through the development of the tools which aid him in his quest for knowledge.
- Area III The Spacearium - a glimpse of some of the vistas of space to give a feeling of its immensity and the relative smallness of ourselves and our earth.
- Area IV Methods of Science - demonstrations of how answers are being sought in six significant areas of scientific research.
- Area V Horizons of Science - a climax and a conclusion which portrays and projects how the outcomes of science affect and will affect people.
- Area 6 Doing Science - the laboratory where young visitors perform simple experiments with expert guidance.
- Area 7 Science Theater - a small auditorium for motion pictures on science and for lectures and demonstrations which will appeal to people of diverse interests and levels of appreciation.



U. S. SCIENCE EXHIBIT

Commissioner
DR. ATHELSTAN SPILHAUS

Deputy Commissioner
MR. CRAIG COLGATE, JR.

Science Coordinator
DR. LLOYD M. BEIDLER

Design Coordinator
MR. LEONHARD W. NEDERKORN

Industrial Coordinator
MR. ALAN F. REEVES

Information Director
MR. EDWARD J. DEVINE

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ON
SCIENTIFIC THEME, CONTENT AND PRESENTATION

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Department of Defense

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Chief, Division of Research Grants
National Institutes of Health
Department of Health, Education & Welfare

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Department of Commerce

DR. RICHARD H. BOLT
Associate Director (Research)
National Science Foundation

MR. CARL R. CONRAD
Associate, Walter Dorwin Teague Associates
(U. S. Science Exhibit Designer)
New York, New York

DR. JOHN P. HAGEN
Director, Office for the United Nations
Conference
National Aeronautics and Space Administration

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Agricultural Research Service
Department of Agriculture

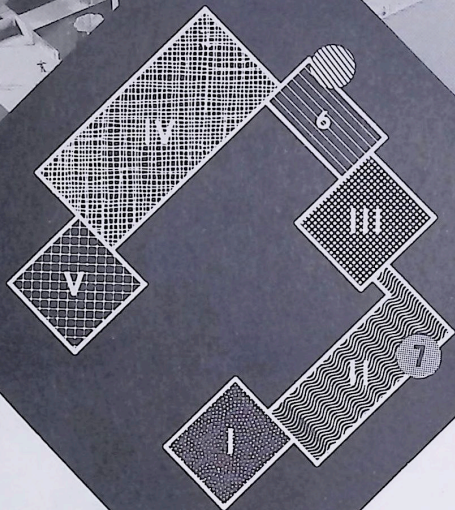
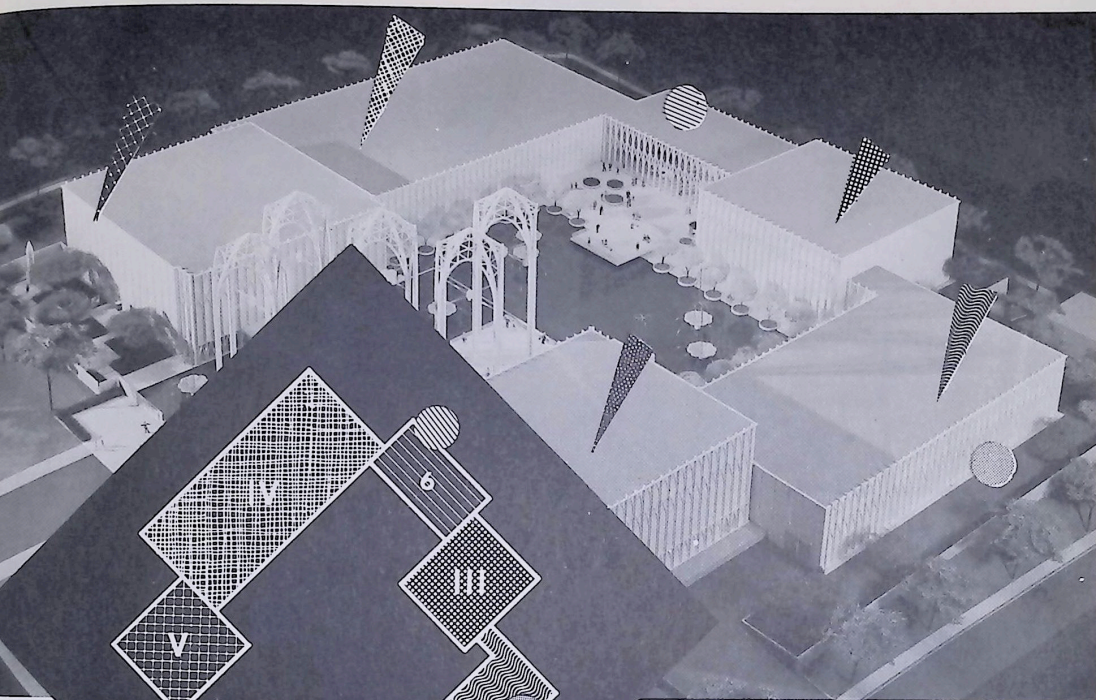
DR. DONALD H. MENZEL
Director, Harvard Observatory
Cambridge, Massachusetts

DR. A. E. PARR
American Museum of Natural
History
New York, New York

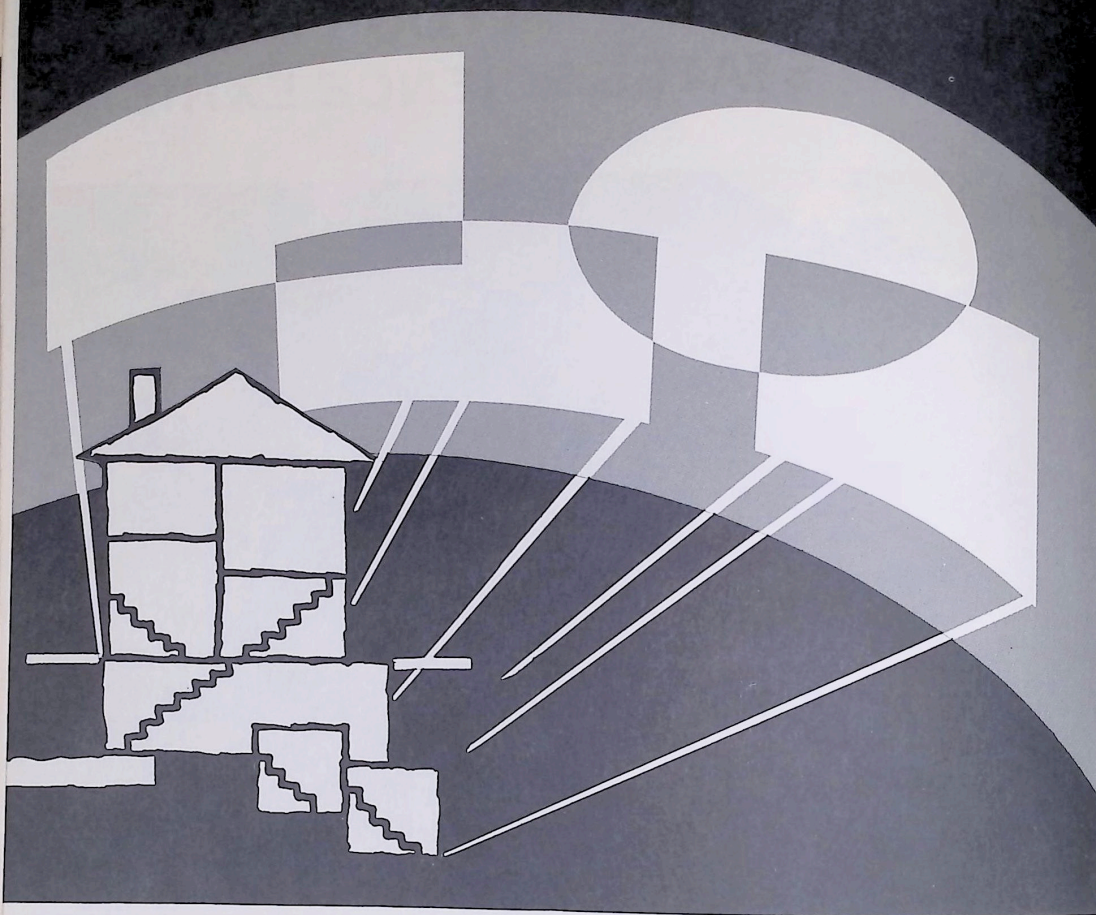
DR. FROELICH RAINEY
Director, University of
Pennsylvania Museum
Philadelphia, Pennsylvania

DR. DAEL WOLFLE
Executive Officer
American Association for the
Advancement of Science
1515 Massachusetts Avenue, N.W.
Washington, D. C.

FLOOR PLAN OF UNITED STATES SCIENCE EXHIBIT



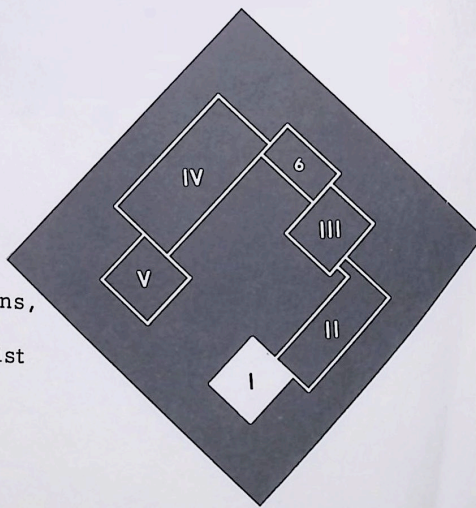
- I The House of Science
- II Development of Science
- III The Spacearium - vistas of space
- IV Methods of Science
- V Horizons of Science
- 6 Doing Science - the laboratory for young people
- 7 Science Theater



AREA I

THE HOUSE OF SCIENCE

A special film, using a unique system of seven synchronized projectors and multiple screens, will introduce the audience to science...the scientist...and the United States Science Pavilion.



AREA I

THE HOUSE OF SCIENCE

...will stimulate and heighten expectation...outline the theme of science...and provide a framework of understanding which will be enlarged and explained later.

PROLOGUE

The film starts with a fully animated sequence in which science is treated allegorically as a constantly evolving structure. Its growth, its pauses, its divisions, its unifications, its increasing complexity and specialization, and its inherent unity is shown.

MAIN BODY OF THE FILM

This is a picture of the "landscape" that surrounds the scientist and in which he works. It is made up of broad cross-sections of his environment, such as: the laboratory; the extensions of his senses; the images these extensions reveal; the instruments for measuring; the notation; the tools for relating his information. Then there is a brief review of the scientist's activity within his "landscape", suggestive of his attitude and approach.

EPILOGUE

This will be closely linked with Area V, and will prepare the visitor for the summations of that Area. The final images are images of humanity, with little of man-made nature, to serve as an introduction to Area II, which opens dramatically with nature in the raw.

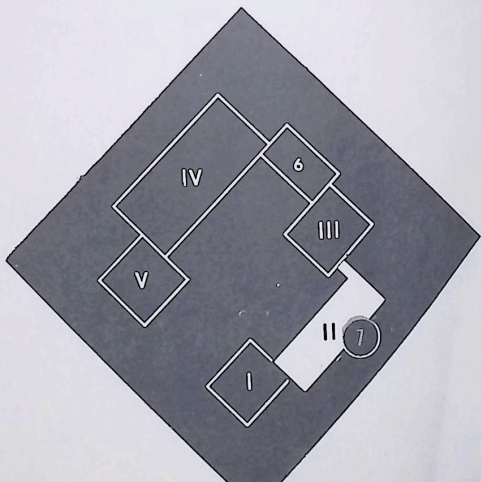
AREA II

DEVELOPMENT OF SCIENCE

A section of exhibits devoted to the aspects of nature which have provoked man's curiosity leads into exhibits that demonstrate the unreliability of man's senses in unlocking the secrets of nature. Area II then describes the development of the tools by which man extends his senses, measures and gives order to his knowledge. In addition, some of the classical experiments in the development of scientific concepts are shown.

AREA 7 THE SCIENCE THEATER

A specially equipped auditorium that will double as a demonstration laboratory and science film center.



AREA II

Area II shows the development of science in several stages. The first depicts dramatic aspects of the natural world --lightning, stars, waves, seasons, spores--which have always aroused man's curiosity.

The second shows the unreliability of man's senses by means of illusions, including touch deceptions and false perspectives. As a real sense limitation, the Doppler effect leads into other limitations of band width, speed of response, and scale.

The third section treats measurements from subatomic particles to astronomical distances showing nuclear counters and scalers, microscopy, organic measurements, stellar observations and spectroscopic analysis.

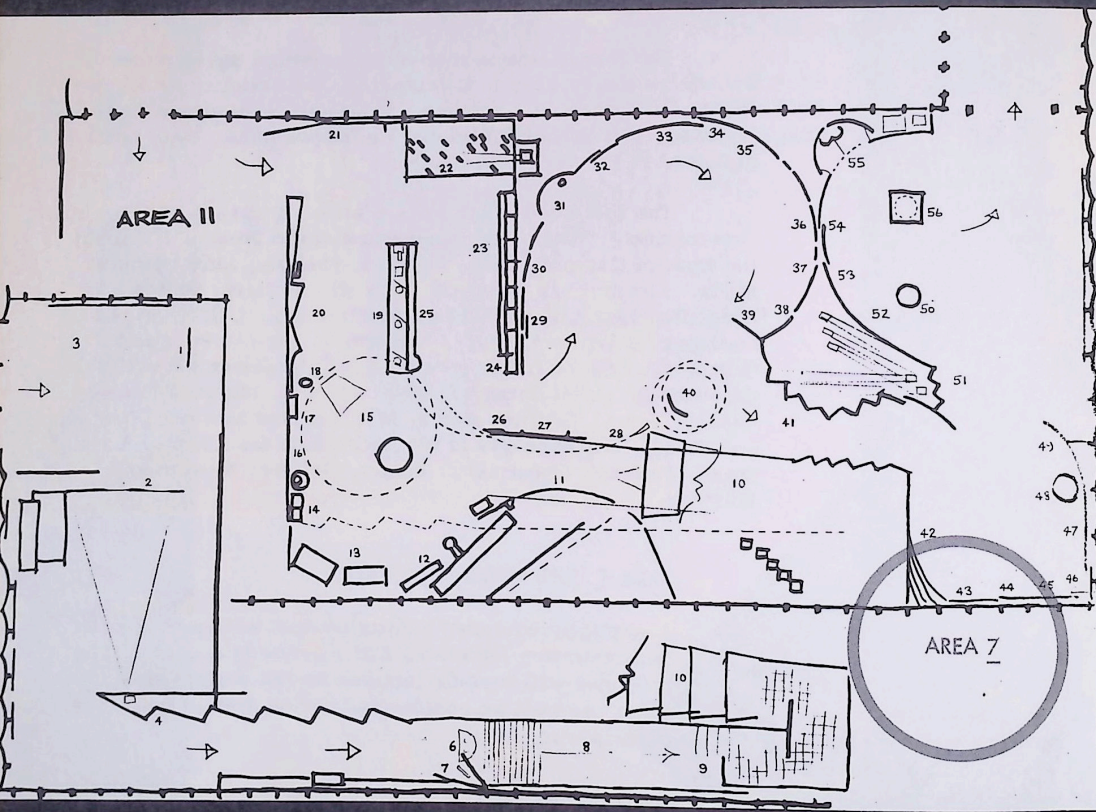
The fourth section traces mathematical development through numbers, counting, recording, manipulation, Euclidean logic, the Pythagorean theorem, inductive development of an equation, and exponential decay are emphasized. This section closes with the modern computer.

The last section presents a series of classical scientific developments. The electromagnetic story is presented through the work of Galvani, Volta, Oersted, Faraday, Maxwell and Hertz. Atomicity is developed through Lavoisier, Dalton, Avogadro, Mendeleev, and in a parallel way, J. J. Thompson, Roentgen, Becquerel, Curie, Rutherford, Planck, Bohr and Chadwick, leading to our present list of fundamental particles. Genetics is traced through Darwin, Mendel, Morgan, Muller, Beadle, Tatum, Griffith, Avery, MacLeod and McCarty, Watson and Crick. Our concepts of the macrocosm are followed through Brahe, Ptolemy, Copernicus, Kepler, Galileo, Newton and Einstein.

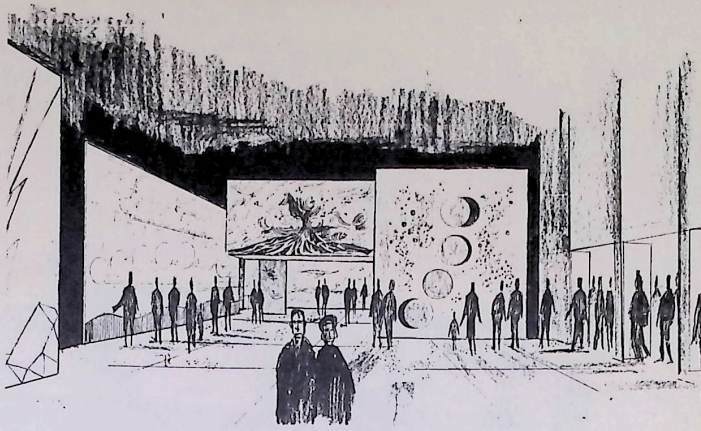
AREA 7 THE SCIENCE, THEATER

A specially equipped auditorium that will double as a demonstration laboratory and science film center. The programs will include lectures on the professional level, as well as popularized demonstrations of classic experiments.

FLOW PATTERN AREA II



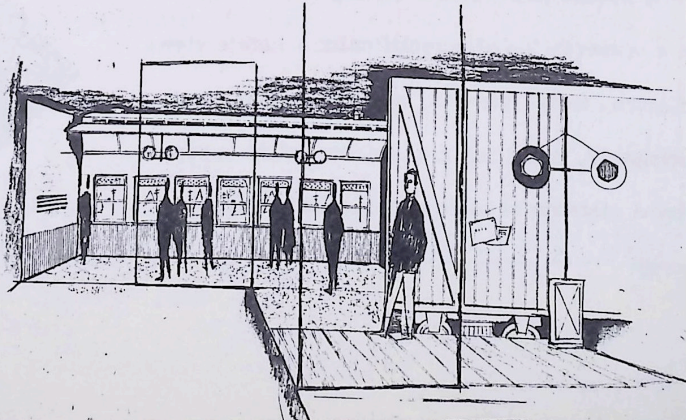
Rear screen motion picture:
The Birth of a Volcano

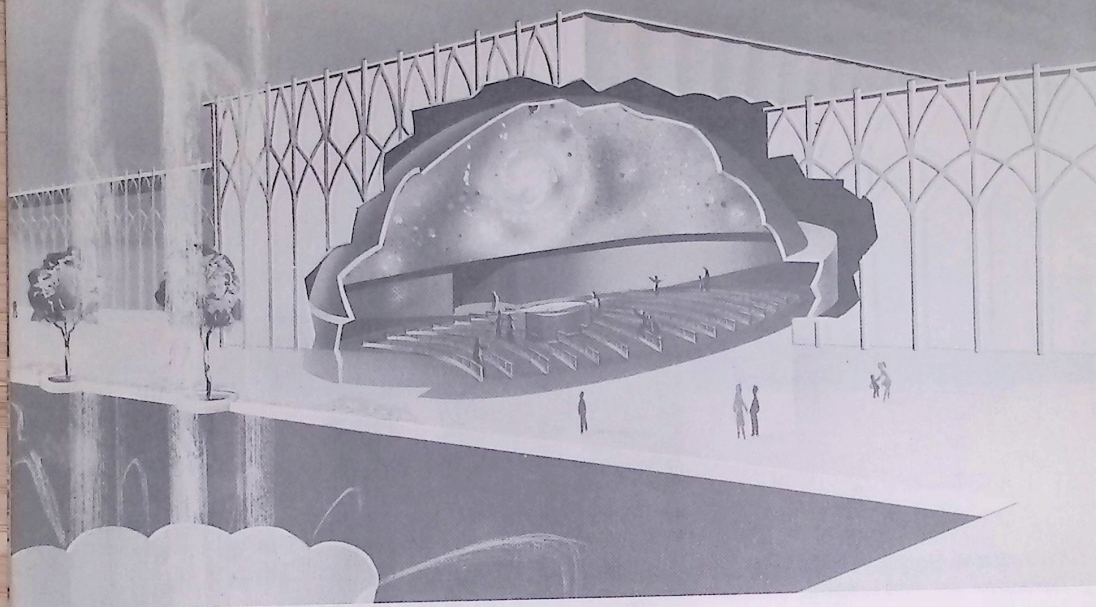


Two-dimensional visual
illusions on overlapping
panels



Doppler effect--a visual
railroad grade crossing
setting for stereophonic
presentation of passing train.

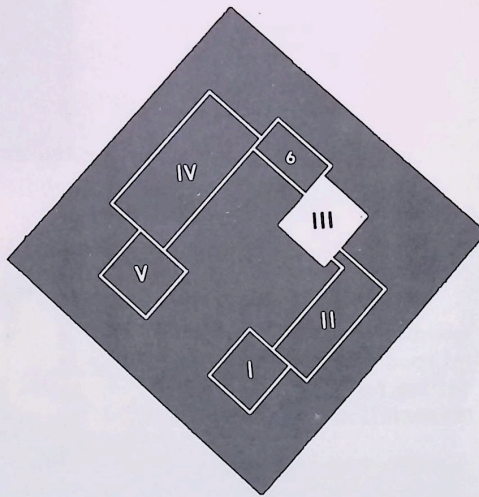




AREA III

THE SPACEARIUM-- VISTAS OF SPACE

The Spacearium will provide a vivid experience--with a feeling of participation--in a presentation of scientifically accurate views of earth, moon, planets, sun, our galaxy, and ultimately, many galaxies as they might appear from a platform capable of transcending time and space.

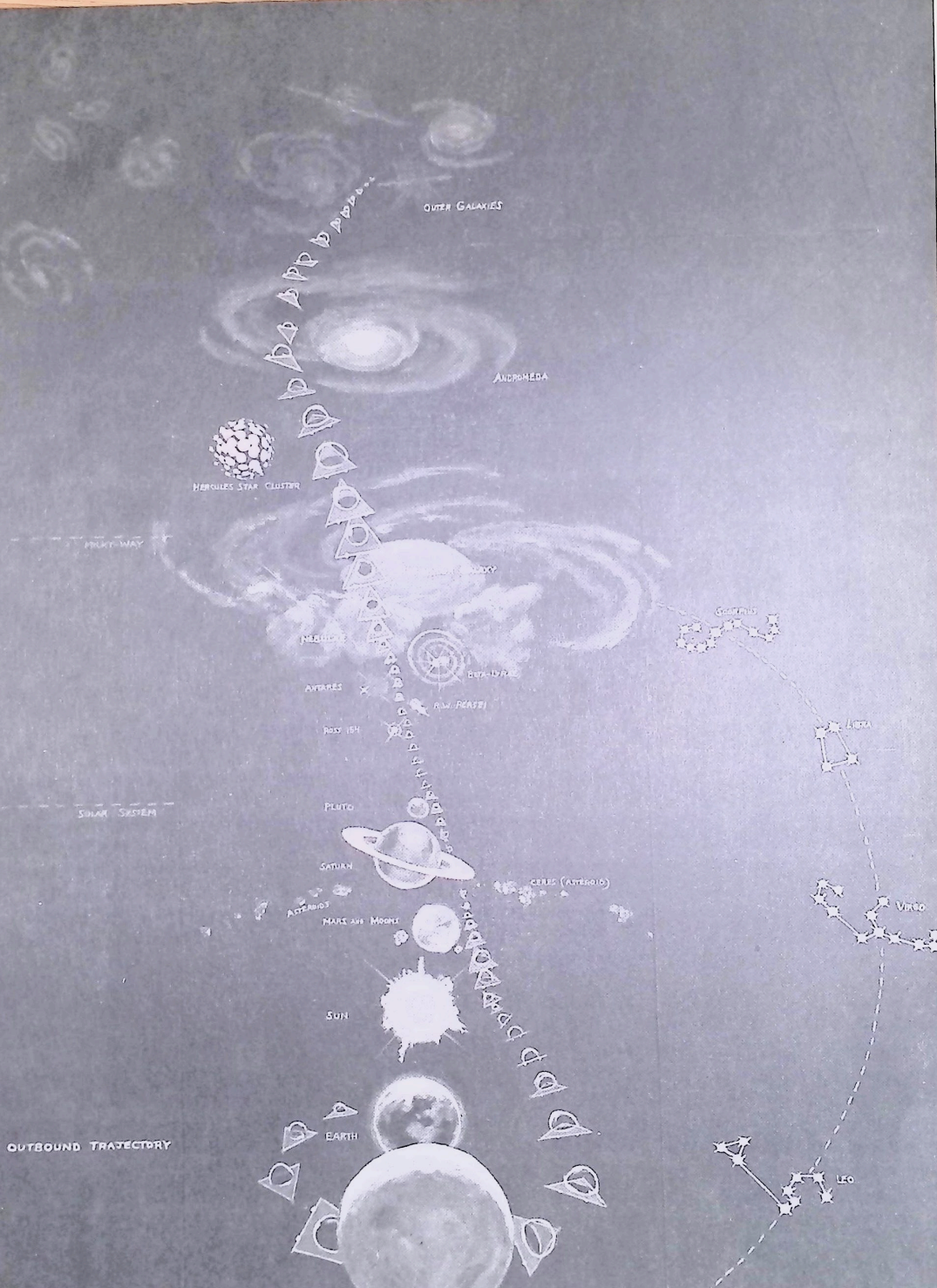


AREA III

THE SPACEARIUM - VISTAS OF SPACE

To give the visitor a feeling of the immensity of space and the relative smallness of our place in the universe, an imaginary ride through the heavens is planned--spanning 2 billion light years in a ten minute journey. From the vantage point of a timeless, spaceless platform, the audience will get closeups of Moon, Sun, Saturn, Pluto, the Milky Way, a globular cluster, the Andromeda nebula, and a supernova. With today's emphasis on space and the "conquest" of space, this film may be the highlight of the fair for many visitors.

The special film technique to be employed in the Spacearium will use a single lens and a hemispheric screen to create a viewing area of 360° horizontally and 160° vertically. The overhead screen, tilted somewhat to present a point of reference, will surround the audience to complete the feeling of participation and to heighten the illusion of reality.



OUTBOUND TRAJECTORY

OUTER GALAXIES

ANDROMEDA

HERCULES STAR CLUSTER

MILKY WAY

MILKY WAY

MILKY WAY

ORION ARM

AVICENNA

SAGITTARIUS ARM

KUIPER BELT

ANTARES

SUN

PLUTO

SATURN

CERES (Asteroid)

ANTARES

MARS AND MOONS

SUN

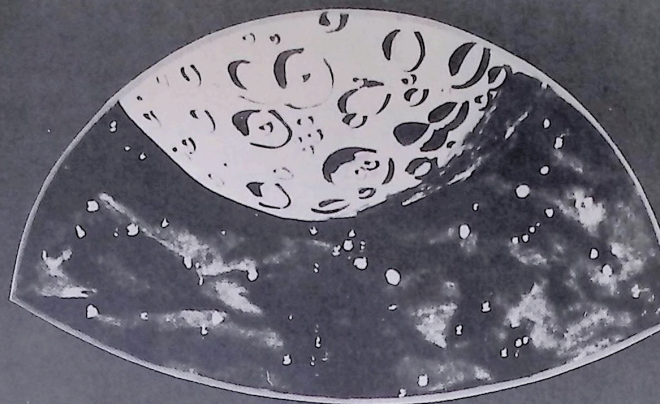
EARTH

LIRA

VIRGO

LEO

"One-quarter of a million miles from Earth, pock-marked with craters, ringed with jagged mountain peaks, the moon's landscape is made up of vast deserts and yawning cracks and crevices! Here there is no water, no air, no sound. Mid-day temperature exceeds that of boiling water; the night is far colder than any place on Earth. Between day and night there is no intervening twilight.



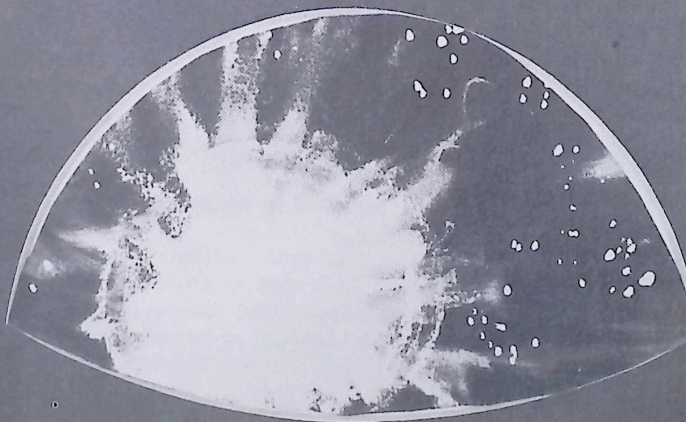
"Mighty Saturn, eight hundred times the volume of Earth, 250 degrees below zero, is master of nine moons.

"Saturn's small core of rocks and metals is overlaid by great masses of solidly frozen ice, hydrogen, and helium; its atmosphere includes crystal fogs of methane and ammonia."



"SUPERNOVA!"

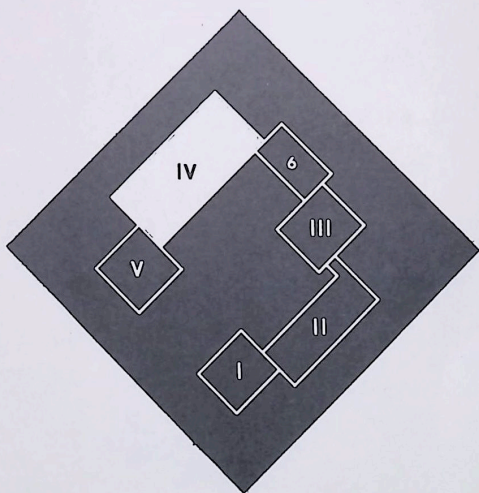
"We have just witnessed a supernova--a cosmic atomic explosion of a star, the sudden collapse that creates a brilliance brighter than all the stars of its galaxy combined. Such sights rarely occur within man's vision, but the resulting shell of gases will be manifest for thousands of Earth-Years."



AREA IV

METHODS OF SCIENCE

The methods of today's scientists are indicated by examples of the work now being done to solve questions in six significant areas. In the process, the scientist is shown at work in many environments and using much equipment that is far from the traditional concept of the laboratory and its apparatus.



AREA IV

METHODS OF SCIENCE

This area will attempt to show how scientists set about asking and answering questions about the natural world. It will contain a series of exhibits of research in progress that will give the visitor some idea of research methods and techniques used to obtain information in diverse projects. The point made is that the laboratory of today's scientist is anywhere he chooses to work-- and the most important ingredients in his experiments are his own imagination and logic.

The projects shown will be grouped into six major areas, representing some of the different kinds of research being done today:

- * What is the nature of our surroundings?

Balloon astronomy, radio astronomy, the fields around the earth, formation of raindrops, ocean currents, the interior of the earth, ice ages.

- * What are our sources of energy?

Controlled fusion, direct energy conversion, closed ecological systems.

- * What is the structure of matter?

High energy physics, nuclear shape, structure and forces, cosmic rays, high temperature reactions, diamond growing, super-conductivity, polymer research.

- * What is life?

Origin of life, genetic synthesis, transmission of genes, radiation effects, synthesis of protein.

- * How do man and other organisms function?

Viruses, factors in cancer, firefly light, cellular forces, tissue regeneration, tissue transplantation, plant growth, the workings of the eye.

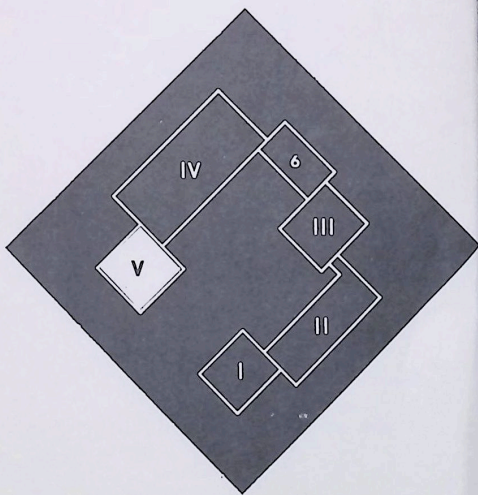
- * What is the nature of behavior?

Salmon navigation, bird imprinting, monkey affection, genetic effects on behavior, drug effects on behavior, animal learning, individual differences in learning, verbal behavior in humans, computer learning and human learning.

AREA V

THE HORIZONS OF SCIENCE

Science is more than an end in itself--it is an integral part of our culture. Science plays an increasingly vital role in shaping our lives, not only through the technology which flows from its applications, but also through the decisions it demands of us.



AREA V

THE HORIZONS OF SCIENCE

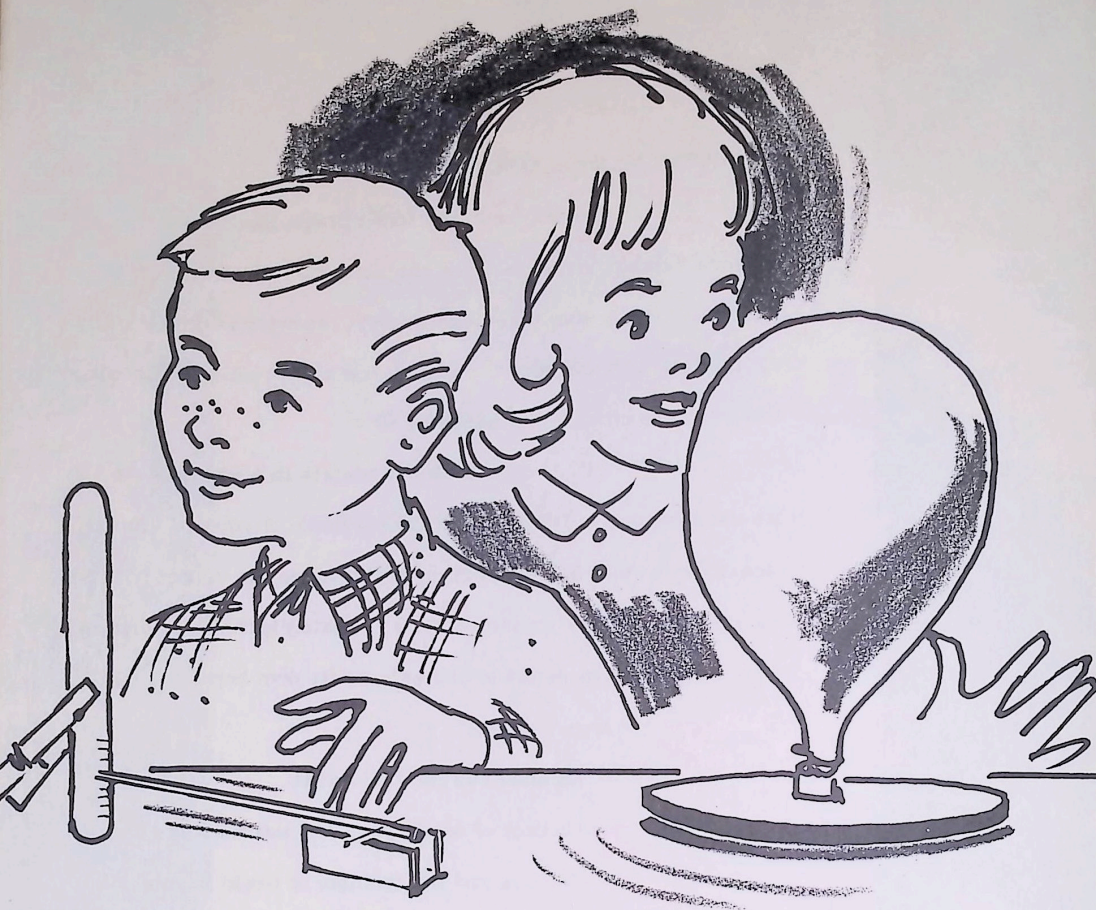
The visitor in his tour through the United States Science Exhibit has so far seen the activities of science. He has seen how... sometimes excitingly... sometimes dramatically... the bits of knowledge are placed one upon another to develop the structure of modern science.

But science does not operate in a vacuum--and its uses cannot be left solely to professional minds and institutions. This final exhibit is designed to leave the visitor with a single impact--how science and its resulting technology can be used by society to increase and enlarge its own horizons.

Area V treats:

- * Science and the individual
- * Control of man's physical surroundings
- * Science and the problem of world population
- * Man's concept of his place in an increasingly scientific and technological world.

While few of us are scientists, all citizens have a responsibility to understand something of their work. Our world will be shaped to a considerable extent by collective decisions on how society will use the findings of science.



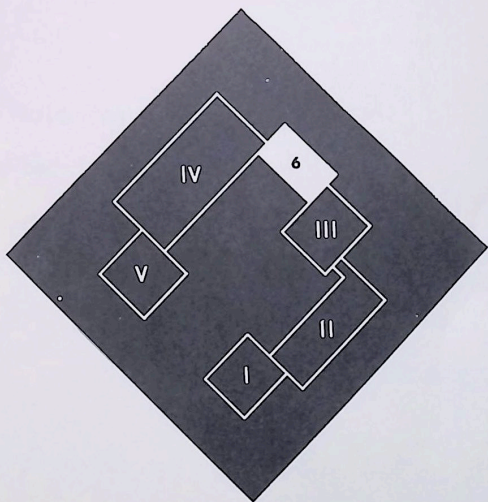
AREA 6

DOING SCIENCE

A laboratory for young people

Here, young people do some science.

Through exciting experiments, they are led to the discovery of important concepts, relationships and laws.



AREA 6

DOING SCIENCE

The young people's laboratory is designed to build upon interest created in other parts of the Science Pavilion. After viewing examples of scientific activity, youngsters are invited to conduct inquiry themselves. By participating directly, they experience the thrill of discovery and perhaps glimpse the beauty of truth. It is hoped that the DOING SCIENCE area may contribute to the career decisions of a few young participants. All, whatever their life's work is to be, will attain some deeper understanding of science and its workings.

In the DOING SCIENCE laboratory youngsters work in groups on experiments of their own choice. They are guided to ask a vital question and undertake an experiment to seek out the answer. Some of the experiments are simple and direct. Others provide opportunities for careful observations and the development of subtle relationships. Some apparatus is assembled by participants from familiar materials. In some experiments they employ professional equipment. Guidance is provided by a special staff.