

The National Parks

A spouting geyser in action and an operating model of the crater of Kilauea are in the exhibit of the National Parks, which includes lighted dioramas of caves, glaciers and canyons in the Parks.

Exhibits of large scale mining operations include a model of a giant gold dredge scooping up the bottom of a jungle river.

Niagara Falls, roaring over its rocky parapet, is shown in an operating reproduction of the cataract which shows the appearance of the crest of the falls at different periods as the water has cut its way back since the discovery of America.

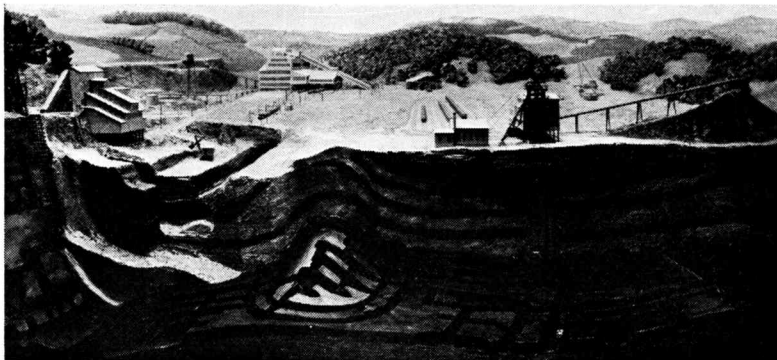
The deep underground network of rivers and streams is illustrated by a working reproduction of the drainage system from Wisconsin, 250 miles north of Chicago, under the city and into Lake Michigan. The effect of past glacial eras in fertilizing soil is shown by comparisons of glaciated and unglaciated areas. Glacial history of the Great Lakes region, exhibited by light effects in a diorama, shows how the outlet has been through various rivers before the St. Lawrence.

MATHEMATICS

From Geology we pass into the next section—this is where we entered the building. We are now in the section of Mathematics, “Queen of the Sciences.” Here is undertaken what never has been attempted before in a popular exhibit—to illustrate and explain the concepts of abstract mathematics by moving object lessons.

In a new set of Dr. Saul Pollock’s celebrated mathematical models we see forms of cubes, cones and ellipses change into other forms and get a visual grip of their relations to each other. Practical applications in everyday life are used as illustrations.

Einstein’s theory of relativity is explained by a series of exhibits understandable by the layman. The Fourth Dimension is another subject rendered intelligible by object lessons.

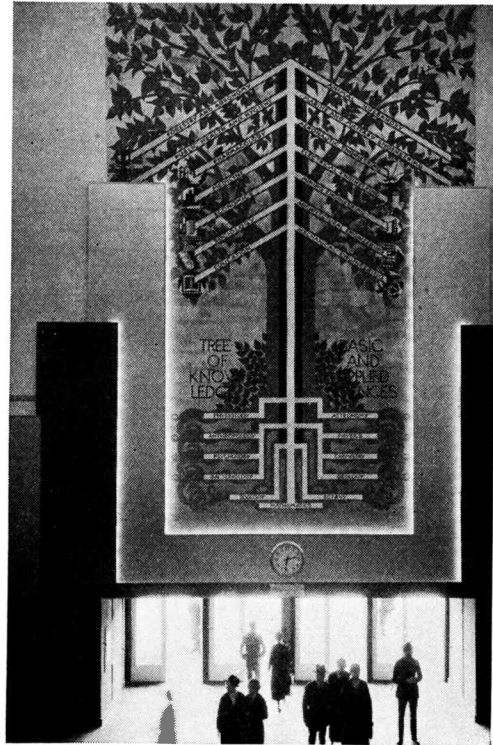


Cross Section of a Coal Mine

The perpetual motion fallacy is shown by six models of famous historical attempts at perpetual motion machines. The machines are made to operate by hidden contrivances to show how this has been done a number of times for purposes of fraud.

How impossibilities may be apparently proved true is shown when before your eyes it is proved that two equals one and that two unequal lines are equal. A new paradox is offered each week.

You may operate Galton's Quincunx, an apparatus that looks like a slot machine game. A mass of small steel balls roll down through intercepting pegs and form various outlines known as "probability curves."



The Tree of Knowledge, by John Norton

The stratosphere flight—with which the Exposition was associated

Airplane Tests

On the balcony a "wind tunnel" shows on various airplane models the application of the theory of aerodynamics.

Stepping on a round platform mounted on ball bearings, you may experiment with the theory of the conservation of rotational momentum. Holding out a dumbbell in each hand as the platform is started slowly revolving, you may speed it up by lowering the dumbbells and slow it down again by raising the dumbbells, repeating the process as often as you like, changing the speed without any additional force being applied, but simply by changing the angle of the weights.

Service of mathematics in the development of radio is shown by historical exhibits of Marconi's original apparatus.

The Stratosphere Flight

The stratosphere flight—with which the Exposition was associated

last year—by Lieut. Commander T. G. W. Settle, U. S. N., and Major Chester L. Fordney, U. S. M. C., is the subject of a special exhibit, the purpose of which is to show the usefulness to practical science of the observations made in the record flight. The instruments used and the records made on the flight are shown and explained.

How mathematical principles are used in gun-fire, in navigation by the position of the stars and in communication is shown here by a United States Navy exhibit. A gyroscopic compass in action has “repeaters” in different parts of the floor showing at all times the direction indicated by the main compass.

From the main Mathematics Section we pass, now, to:

PHYSICS

In the Physics Section a series of exhibits show the generation and control of power.

The exhibits are divided in six groups: gases, sound, electricity, radio, light and penetrating invisible rays.

Operating apparatus shows how the expansion of gases produces the effects of refrigeration. A working model with magnified molecules represented by steel balls shows how the internal pressure in an automobile tire is due to incessant bombardment of the walls by the molecules which have the speed of rifle bullets.

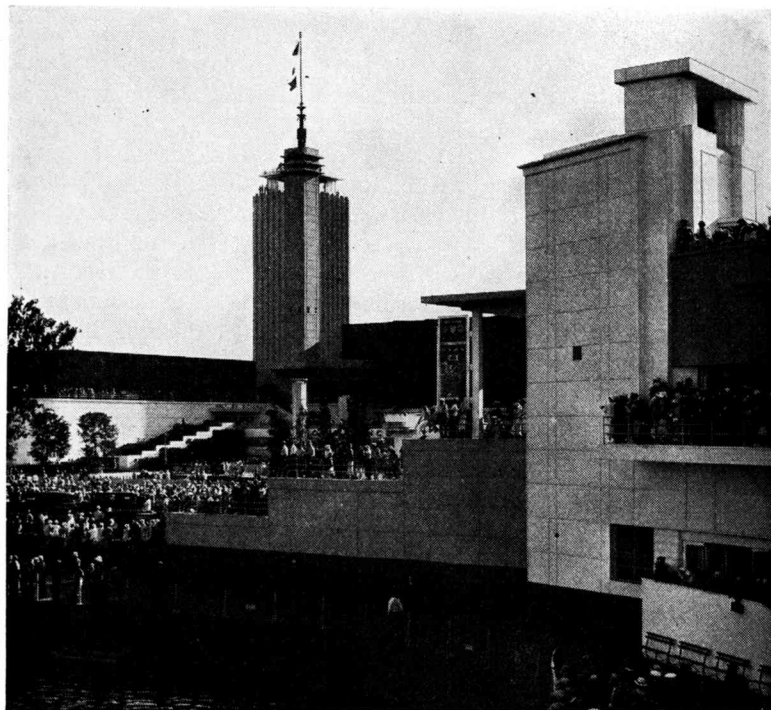
We see an operating steam engine with glass cylinders, showing the working of the expanding steam. A drop of water four inches in diameter illustrates why drops are globular and shows why their shape in falling suggests the principles of “stream line” design.

What sound is and how sound waves travel are shown by operating exhibits. We see a large tuning fork vibrating slowly with a wide stroke. Amplification of the sound is shown by four tubes of different length. We see the image of the vibrating flames within the tubes reflected by a rotating mirror.

That sound is vibration and that the variety of sound is produced by vibrations of different length is shown by a magnified image of the sound-creating edge of a movie film. As the jagged line passes we see that the broken light, which itself is a form of vibration, is changed into sound by the vibration being transmitted to the diaphragm of a loud speaker and we see the light translated into words and music.

Fundamental principles of the electric dynamo, transformer and motor are shown by simplified moving exhibits.

The valve tube, heart of the radio set, is analyzed and explained in detail by exhibits showing the action of the filament, grid and plate.



Hall of Science, Tower and Court

Light Rays

Refraction, or bending of rays of light by means of lenses is shown, and we see how the lens forms an image, magnified or reduced. We see illustrated that light is a vibration. A magnified exhibit shows that the wave length of the vibration is about twenty millionths of an inch. Different colors have different wave lengths. Method of analyzing blended colors into separate wave lengths identifying the different colors is shown.

The electron and the proton, building stones of all atoms, were discovered by physicists. These most minute of all known divisions of matter are invisible but at speeds of 100 to 100,000 miles a second they are called cathode, canal, alpha or beta rays and produce effects which can be seen.

Luminous effects of cathode and canal rays are shown in vacuum tubes, also tracks of alpha rays from radium. Exhibits show the penetrating effects of X-rays, which are produced by cathode rays striking other substances.

THE GREAT HALL

From the Physics Section we now walk into the Great Hall of the building. The treatment of this huge modern interior again

calls on us to give a moment's thought to the decorative methods of the new architecture. The hall is 240 feet long, 60 feet wide and with a ceiling 57 feet high. The geometrical decoration of the wall spaces illustrates the modern idea of having the ornament in keeping with the function of the interior.

Above the north doorway at the balcony level is one of the three large mural decorations by John Norton. What could be more modern and original in conception than the treatment of a "graph" of scientific information as a mural decoration. "The Frequencies of Electromagnetic Waves in Kilocycles per Second" is the title. At the far end of the hall in a similar bay above the south entrance you will see a companion decoration, treated in the same manner, "Dimensions of Natural Objects in Miles."

Framing the center door to the terrace and towering toward the lofty roof is another graphic decoration in scarlet and gold, "The Tree of Knowledge."

Emblazoned on the walls of the great hall as part of the decorative scheme are quotations which epitomize the thought of fourteen great minds on the development of the basic sciences. Besides these quotations are nine axiomatic definitions.

The Clock of the Ages

At your left, as you enter the great hall from this end, you look back a moment at the history of this planet as it is visualized in a remarkable demonstration—"The Clock of the Ages." This is a ten-foot dial representing the advancing geologic periods by compressing two billion years into one revolution of the clock hands in four minutes. Mammals, the dominating life of the present, do not appear until almost the end of the revolution, and man is on the stage only a few seconds.

In the center of this end of the hall you see the gondola in which Dr. Auguste Piccard made the first ascent of 54,000 feet into the stratosphere.

The Periodic Table of the Elements is in the center of the floor at the south end. In this illuminated pedestal, surmounted by a globe which shows their distribution, we see the ninety-three known elements that compose the world of matter. We can see their atomic relation to each other, and this gives the clew to their separation and recombination into different substances, the principles of which we may now watch demonstrated as in the active operations of the chemical laboratory.

CHEMISTRY

We are now in the Chemistry Section where we shall see demonstrated the science of the transformation of matter.

A simple chemical change by separation is shown by metallic mercury being produced from mercuric oxide—a red powder—by heating



The Great Hall in the Hall of Science

in a quartz retort over an electric heater. Silvery mercury drips from the retort tube into a glass jar while the oxygen blows away, presence of the oxygen being shown by a smoldering wick bursting into flame as the oxygen strikes it.

An extensive series of actual chemical operations of this type is shown, illustrating transformations by separation and by combina-

tion. Explanations by placards and by voice make each reaction easily understandable.

A ribbon of iron burns like paper because of a jet of oxygen. A stream of liquid fire is caused by a jet of phosphorus forced through a small orifice and instantly combining with the air. We see potassium dripped into water and bursting into flame. A number of other illustrations show how the atoms of different elements rush to combine with each other. The exhibits show how chemical changes are always accompanied by energy changes—heat or light being liberated or absorbed.

Furnaces at 3400° C.

A battery of electrical furnaces—the principle of which is the same whether they are laboratory bench size or fifty-ton size—shows the use of intense heat, up to 3,400° Centigrade, to induce chemical combinations. Melting lime and coke together to produce calcium carbide is demonstrated. You may safely put your hand inside an induction furnace in which a rod of iron will blaze and drip like melting wax—but your ring or wrist watch would melt off instantly.

Extreme cold produced by the expansion of a gas is illustrated by a series of demonstrations with liquid air. The principle is shown by air being admitted to a partial vacuum in a flask. A rainbow in myriads of minute water drops shows the chill of the expanding air.

Liquid air is produced by air being compressed at 3,000 pounds to the square inch. Suddenly released, it chills to a pale bluish liquid about the consistency of water and at a temperature of 317 degrees below zero.

The demonstrator dips a stick into mercury and then into a flask of liquid air. The mercury instantly freezes hard as steel, and he will drive nails with it. He will plunge a rod of hot iron into the liquid air and the iron will blaze up on account of the concentrated oxygen. A burning stick of carbon plunged into liquid air burns incandescently. When the flask of liquid air is set on a cake of ice the liquid air boils fiercely on account of the comparative heat of the ice.

An elaborate working diorama of a model sulphur mine shows the mill and surface operations, the sulphur deposit 500 feet below the surface and the method of melting the sulphur and bringing it up.

Colloid Chemistry

Exhibits of colloid chemistry show the methods of purification of water and air and of separation of gold from the ore.

A colloid is a substance suspended in another substance, the suspended substance being so finely divided that it is invisible, will not settle and cannot be removed by filtration.



The Periodic Table of the Elements

Contaminated water is shown purified by a solution of alum which forms a jelly-like substance and sinks, carrying the colloidal impurities with it. Smoky air is shown cleared by passing it between electrically charged plates. The colloidal particles become electrically charged, cling to the plates and the air blows out pure.

Gold ore is shown pulverized, mixed with water and oil and churned into foam. The base material sinks while the gold remains colloiddally suspended in the froth which is skimmed off.

A giant talking and gesturing robot, ten feet tall, with a transparent digestive tract, is the dramatic feature of the exhibit of physiological chemistry. In a theatre at the end of the hall, the robot gives a lecture on the chemistry of food and shows food passing through his own stomach and intestines, and being digested.

BIOLOGY

Before we enter the Biology Section, we see at this end of the Great Hall a remarkable moving model showing how trees grow. In this moving exhibit we see a section of a basswood twig, magnified to seven and one-half feet in diameter, representing a branch three years old. The twig adds a year of growth in seventy-five seconds, becoming nine feet in diameter by the accretion of new material.

We now enter the Biology Section, occupying the South Wing of the main floor of the Hall of Science.

At the entrance of the section is one of the most unusual and interesting scientific exhibits. It is the Microvivarium, developed by Dr. Georg Rommert. Actual drops of water are the stage of this exhibition. High power microscopes look through the drops and project on screens the scenes greatly enlarged, so that you may see the ferocious, weird, incredible microscopic living creatures, swimming, eating, making love and fighting in their infinitesimal world.

The Biology Section takes up the story of how life takes form—from the primitive cell to its highest evolution in man. Magnified cells and moving models demonstrate the principles of growth in animals and plants.

Development of the human being from the cell is told in a series of embryological exhibits. Cages of healthy guinea pigs illustrate variations through heredity.

From Fish to Man

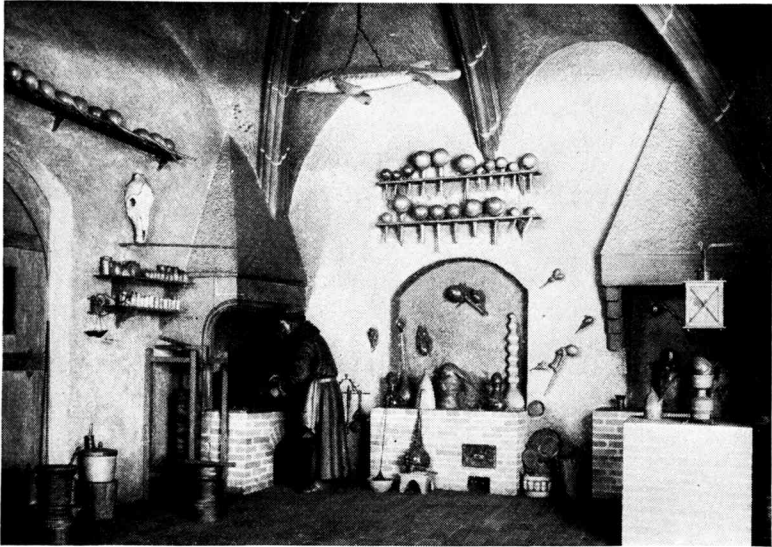
Evolution of the human face—from fish to man—is shown by a series of models in the Paleontology exhibit. Evolution of the horse and other mammals and of the invertebrates also is shown by complete models and comparative exhibits.

A life size model of a man shows the circulation of the blood by means of a magnified heart pumping, the valves working and the red blood flowing out through the arterial system while blue blood is returned by the veins.

The different characteristics that produce high or deep voices are shown by moving models of the chest and throat. The lungs move, the ribs expand and the larynx vibrates.

How plants grow is shown by a moving exhibit of the marriage of plant cells in a magnified dahlia stalk. A pollen grain from another plant drops into the flower, moves down to the ovule and in four stages the united cells produce a living seed containing a miniature plant.

That food elements are produced in plants only in daylight is shown by a moving exhibit of the cell structure of a corn stalk. Circulation through the cells of oxygen, carbon-dioxide and water vapor is shown. At night the plant gains size but food elements are formed only under sunlight by the natural complete influence of all the sun's rays.



The Alchemist's Laboratory

MEDICINE

We now descend to the ground floor of the Hall of Science, to the section of Medicine.

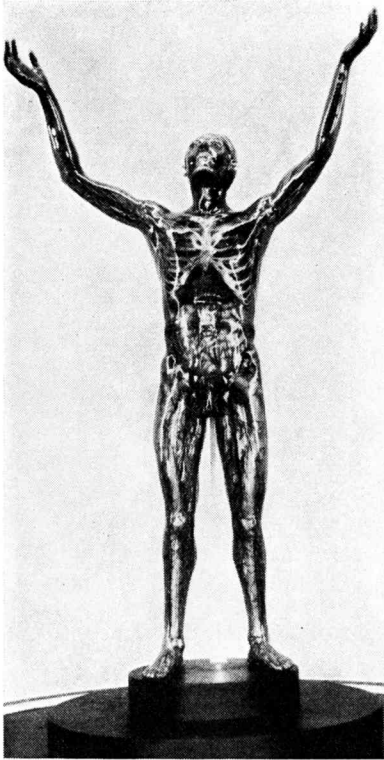
The display of the Medical Sciences visualizes the tremendous advance in the past century in the knowledge of the causes, detection, prevention and cure of human and animal diseases. Scientific medical institutions of England, France, Germany and Italy have cooperated with the American associations. Large additions made to the Medical Section for the Exposition of 1934 include:

The Henry Ford Hospital of Detroit, Mich., shows oxygen therapy in the treatment of pneumonia, and the tannic acid treatment of burns for diminution of pain and more plastic healing.

Methods of medical evidence in crime detection are shown by the medico-legal exhibit of the Institute of Medicine of Chicago.

Water, heat and rest therapy are shown by the U. S. Government exhibit from Hot Springs, Ark., National Park. The Chicago Roentgen Society has an exhibit of the X-ray, including a skiagraph of the entire human body as revealed by the X-ray.

Prevention of the transmission of disease from animals to man and the use of veterinary science in food inspection is shown by the American Veterinary Medical Association. Drills in resuscitation from asphyxiation are shown by the Chicago Rapid Transit Company medical department. Progress in knowledge of human reproduction through the internal secretions and sex hormones are shown in an exhibit by Yale University and St. Louis University.



The Transparent Man

Visitors may use the Teletactor, an instrument for the education of the deaf by vibrations which change frequency and amplitude corresponding to sounds produced by speech.

The Transparent Man

In the Medical Section are a number of the most remarkable exhibits ever prepared by scientists. Outstandingly spectacular is the Transparent Man. This life-size figure is one of only two in the world. It is from the Deutsches Hygiene Museum in Germany and is an example of the patient labor of German science. The figure has a skin of transparent cellon. All the organs of the body are in place and are illuminated in turn, showing their size and position. You walk around the figure and look through it as if you were possessed of X-ray eyes.

The transparent man is a handsome figure in the classic attitude of a suppliant like the statue of the young Antinous. The gradual lighting up of its interior is a spectacle of singular dramatic power as it reveals the organism that is inside every human body. Elsewhere moving models of parts of the body may be operated by the visitor showing the action of joints, operation of the breathing apparatus, circulation of the blood, the larynx in different states and horizontal sections of the body, are shown in a life-size model in eight parts.

The Embryos

A most fascinating exhibit is that of the various stages of the human embryo, shown by the Loyola Medical School of Chicago. This exhibit attracted so much attention last year that it has been given greatly increased space. The display includes an exhibit of actual cross sections of human bodies.

The works of Louis Pasteur, pioneer of bacteriology, and of Robert Koch, who discovered the tubercle bacillus, are shown in commemorative exhibits.

An extensive exhibit of work in bacteriology, and tropical diseases of man and animals is that of the great Wellcome Research Institution of London. The institution shows models of the floating laboratory presented to the Sudan government on the Nile and of the mobile laboratory given the British War Office during the World War.

Progress of hospitals in the past century in America is shown by the American College of Surgeons. The American Medical Association uses dioramas, mechanical displays and transparencies to show the evolution of medical care. The American Pharmaceutical Association illustrates the evolution of medicine dispensing from an old-time pharmacy to actual demonstrations of modern prescription compounding, assays and chemical tests.

History of blood transfusion is shown by the use of actual instruments in the exhibit of the Cleveland Clinic Foundation. Physiological relations of the thyroid, pituitary, suprarenal and sex glands are shown by specimens, models and charts.

The development of abdominal surgery and work on the treatment of pernicious anaemia are among other subjects of exhibits of the Simpson Memorial Institute for Medical Research of the University of Michigan.

Motion pictures, wax models, transparent photographs and charts are used by the Mayo Foundation to illustrate work on goiter, diseases of the digestive tract and of the nervous system. A large electric thermometer enables visitors to take the temperature of their hands and a tremometer enables them to test their nerve steadiness.

Work for Crippled Children

Rehabilitation of the crippled child is the subject of the University of Chicago exhibit. Motion pictures show results of work on acute infantile paralysis. Models and photographs illustrate the possibilities of work on the spine.

Bright's disease is illustrated by specimens of organs and the relations between kidney disease and acute infections are shown by Marquette University and Milwaukee County Hospital.

The American Urological Association presents an exhibit on diseases of the urinary tract.

Questions and answers on maternal hygiene are shown by the Chicago Medical, Dental and Allied Service Women's Association.

The fight against tuberculosis is portrayed by the Chicago Municipal Tuberculosis Sanitarium and the Chicago Tuberculosis Institute.

Care of the teeth and the progress of dental science are shown by the Chicago Centennial Dental Congress. Motion pictures, operating models, specimens, charts and transparencies are used to show methods of treatment and the relation of the teeth to the general health.

Relation of focal infections to systemic diseases is the subject of the exhibit of the University of Illinois and the Illinois Department of Public Health.

The University of Wisconsin presents the history of the pioneer work on gastric digestion, result of the observation 100 years ago of Alexis St. Martin, whose digestive operations were visible as a result of a gunshot wound.

Northwestern University exhibits a collection of rare old prints of early medical subjects and a library of rare medical works.

SCIENTIFIC COMMERCIAL EXHIBITS

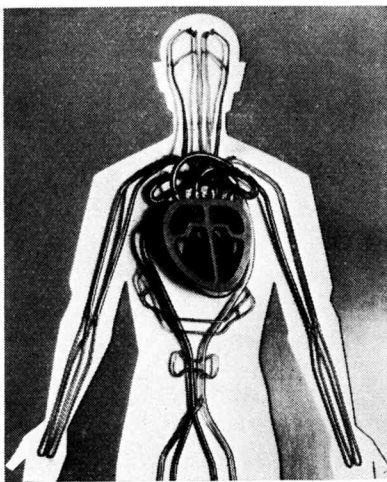
We have seen, now, a virtually complete survey of the progress of medical science.

On this—the ground floor of the Hall of Science—you may look next at an extensive series of collateral exhibits by scientific manufacturers.

You see in a copper-lined welding pit the operations of welding and cutting steel with the oxy-acetylene blow torch.

In a tank of hydrochloric acid a steel wire is shown being eaten away while an alloy wire is unaffected. A special steel lathe tool, heated red hot, is shown in a moving exhibit, cutting down a steel casting hour after hour without losing hardness.

Irradiation of milk to increase its vitamin D content is shown on a revolving stage. Exhibits show uses of sun ray lamps and uses of acetylene gas for farm and home power and illumination.



Mechanical Heart

illustrations of uses of the products in cooking, fireproofing and building.

A model apartment sitting room, bathroom and kitchen illustrates wall panels, tiled floors, doors, ceilings, and windows made of an unbreakable, glass-like by-product of natural gas, unaffected by heat or cold.

The space of the exhibit is air-cooled by apparatus shown in operation.

Another manufacturing exhibit is a large working model of a plant making phosphoric acid products. Molten material pours from the blast furnace and the other departments of the extensive plant are in operation. The exhibit includes

The story of a century's progress in eye-sight protection and correction is told in an optical exhibit. A section of the display is devoted to protection of workers' eyes against industrial hazards. Operation of grinding lenses for optical and scientific uses are demonstrated in another exhibit.

Advancement in amateur and professional photography is shown by exhibits of cameras, lenses for use under all kinds of light conditions, prints and motion picture equipment.



*Modernistic Statue Group in Hall of Science
by Louise Lentz*

Ancient and Modern Drug Stores

Contrast between the ancient mediaeval apothecary shop and the modern pharmacy is shown. There are a number of exhibits of drugs and chemical products, including foods for infants and special invalid foods.

Advancing use of milk products is subject of a special exhibit.

A remarkable enlarged reproduction in colored sculpture relief of the celebrated painting, "The Doctor," by Luke Fildes, R. A., is shown by one exhibitor.

Rare precious metals, palladium, rhodium and others, methods of electroplating, uses of gold for dental and other purposes, are shown.

Sun lamps are displayed in a darkened booth to show their fluorescent effects. Uses of other special ray lamps for individual and group treatment are shown.

Microphone apparatus for the aid of the deaf is shown and demonstrated. There is an exhibit of surgical instruments, and one of mattresses. Embroidered silk shoes, of the kind worn by Queen Elizabeth, brocade knee boots, African sandals, Polynesian and Chinese shoes are among the curiosities of footwear shown in an exhibit of scientific shoes and foot ailment correctives.

Methods of floor, furniture and automobile polishing are exhibited. There is also an exhibit of fire prevention equipment.

OUTDOOR SCIENCE THEATRE IN THE COURT OF THE HALL OF SCIENCE

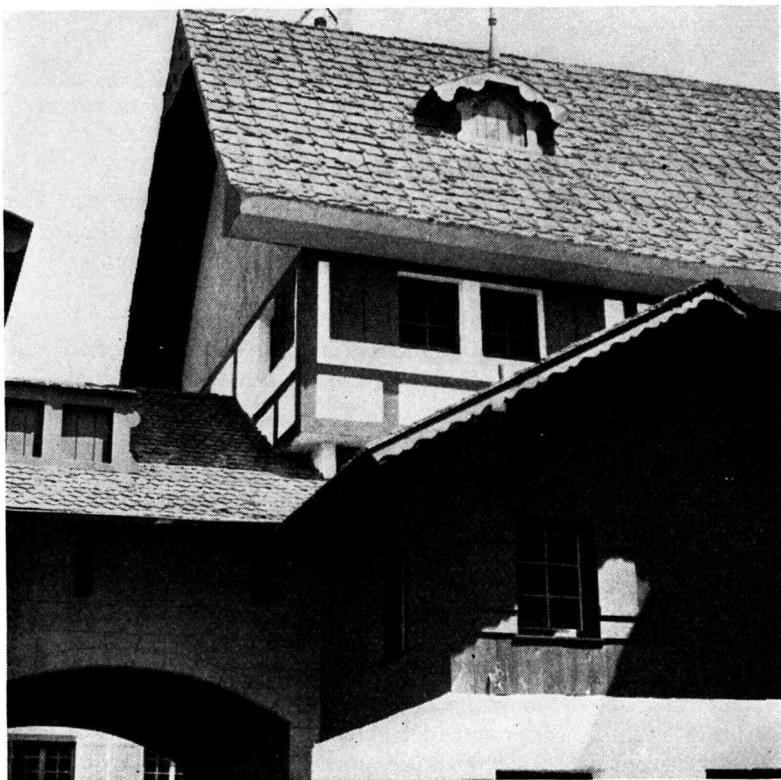
From the great open court between the wings of the Hall of Science, 10,000 persons at a time may witness the performance of seeming miracles on the stage of the Science Theatre. The stage is at the open end of the court with its back toward the lagoon.

The different "acts" show invisible rays and other mysterious powers in action, performing apparently impossible feats of magic. Wireless telephony will repeat from the stage conversations and interviews from airplanes and from distant parts of the world.

The science theatre acts are planned on an educational basis and the principles involved are explained.

ARCTURUS BEACON

As the season advanced last year it was sometimes difficult even for the huge observatory telescopes to pick up the rays of the star Arcturus in its position in the brilliant part of the evening skies in



The Swiss Village

time for the star's rays to be used to turn on the lights of the Exposition. This year the rays of Arcturus will light the Exposition Beacon in the court of the Hall of Science every evening at twilight.

The Beacon is a great torch flaming from the top of an ornamental pillar. A powerful reflecting telescope on the terrace of the Hall of Science picks up the ray, which has been traveling 40 light years from Arcturus, and this ray, amplified, lights the Beacon.

Restaurants in the Hall of Science:

*Triangle Restaurant in North Wing. Also grill.

*Century Grill in North Wing. Also lunch counter.

*Drug Store in North Wing. Lunch counter and table service.

‡SWISS VILLAGE. A typical Swiss mountain village, nestling at the foot of the Alps, populated with native Swiss at their work, sports and amusements. The buildings are reproductions of characteristic parts of the older portion of Berne, capital of Switzerland. Plaster casts of exteriors are used to give exactness to the houses and chalets. St. Bernard dogs, Alpine guides, watch makers, Swiss lace makers and cheese makers are seen. A group of yodelers and Swiss maidens give entertainment in the village square with native songs and folk dances. Background of the village is an Alpine scene of rugged peaks and valleys.

*Swiss restaurant, a la carte, indoor and outdoor tables. Also grill. Floor show and dancing by guests.

18TH STREET BRIDGE ENTRANCE, over Illinois Central tracks and from Columbus Drive. Pay parking space. Taxi stand. Exposition bus stop.

GENERAL EXHIBITS GROUP

GENERAL EXHIBITS BUILDING. This great building, 985 feet long, was designed by Harvey Wiley Corbett. The floor space of the two stories is more than five acres. In each of its four pavilions you will find striking mural paintings of the modern school.

The General Exhibits Building was planned to tell the story of many and varied industries.

New ideas of arrangement and use of striking modern furniture are seen in twelve different sleeping rooms, completely equipped and ready for use, as planned by twelve modern interior decorators.

Demonstration is given of the operation of machinery which fashions 24,000 steel mattress springs in an hour.

Up-to-date factory floor layouts are used in a demonstration of the use of lift-trucks and portable elevators.



General Exhibits Building

Oil Exhibits

Automobile engines, with part of the cylinder walls and housings cut away to show the moving parts, are a central feature of a demonstration of the oil industry. Reproduction of a giant vacuum oil still is shown.

In this exhibit you may seat yourself in an airplane pilot's seat or in a racing automobile driver's seat while a moving picture flows before your eyes as if you were driving the machine.

"Mechanical Wonderland" is a series of more than 200 working models showing how the combinations of wheels, eccentrics, gears and levers are developed into complex automatic movements.

Heavy engineering equipment, electrical machinery, pumps, valves, and light and heavy scales are in an exhibit of machinery for big jobs.

Air conditioning equipment for homes, offices and industrial uses are the subject of an exhibit, which includes oil-burning installations for heating.

In this section of the building we find exhibits of coal transportation, power belting, plumbing equipment, motor lubrication, modern gas, oil, water and gasoline meters. Progress of the canning industry is shown in many types of containers. There is an exhibit of sewing machines. Modern bars for home and cafe service are in an exhibit which includes home and club billiard tables.



Gutenberg's Print Shop

In the world's first print shop, that of Johannes Gutenberg, of Mainz, Germany, in 1438, you see a reconstruction of Gutenberg's own press. You may see in use, casting type, some of his original molds. You will see fine hand printing jobs of pages done on the antique equipment and with Gutenberg's type.

The first printed book page, that of the so-called 42-line Bible, is in the exhibit. Printers, in mediaeval costume, work in the shop and pull proofs on the ancient hand press.

In the exhibit is a facsimile of the original Gutenberg Bibles and reproductions, made by copying Gutenberg's type, of the "Calendar of the Turks," the first printed circular, done by Gutenberg's shop in 1453.

Associated with the Gutenberg print shop you see an exhibit of fine presswork and book binding of the present day.

In an exhibit of rare books bound by hand you will find "Die Niebelunge," a masterpiece of the artistry and workmanship of this craft. With it is a display of beautiful products of fine book making. Artist book binders are seen at work, binding and decorating books, hand-tooling French, Levant and Morocco leather.

Encyclopedias, text books, magazines, French and European publications, and sets of books for children, are among exhibits of publishers.

Paper nails that can be driven into hard wood supply a nail that is a non-conductor of electricity.

Household uses of paper are demonstrated in the House of Paper, in a kitchen which is a model of conveniences.

Photographs by distinguished amateurs and professionals are seen in a Salon exhibition with an historical display of early cameras.

Modern rug weaving is demonstrated on a huge jacquard loom, 9 by 12 feet, at work on a modern Oriental rug.

Porcelain enamel products and their various uses are shown in a cooperative exhibit of the industry.

Business Machines

How the enormous routine of book-keeping, correspondence and office systems is carried on by modern business is shown by business machines.

You see machines that tabulate, sort and file. They can automatically sort out any group of cards from a file of hundreds of thousands in a few minutes. Books and records are kept by machinery. Intricate tasks that would require thousands of eyes and fingers are rattled off at dizzy speed.

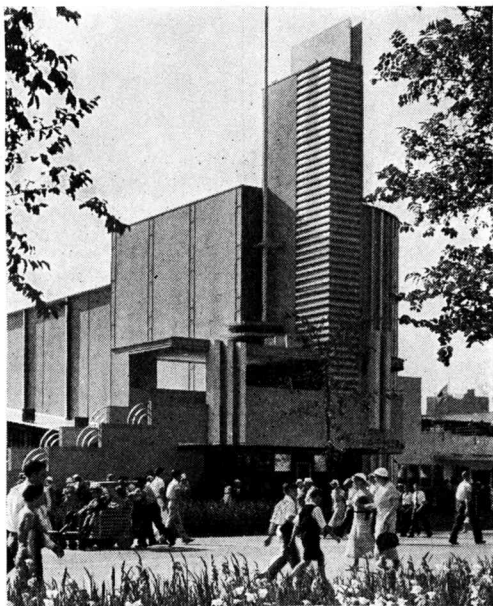
Cash registers of different capacities are exhibited.

Electrical dictating machines, office and home safes, rubber stamps, inks and pastes, magazine pencils and other office supplies have their exhibits.

Education by mail is the subject of an exhibit.

In the Home Work Shop clever workers are making pieces of early American furniture, starting with the plain lumber. You may watch them making ship models, model airplanes, toys and smoking stands.

Safety devices that foil hold-ups of offices or banks are shown in an exhibit of safes. Slow opening combination locks are connected with silent electric alarms. Office protection devices, safe keeping for



A Tower of the General Exhibits Building

files and records, and home safes are shown.

Diamond Mine

†A South African diamond mine in operation, with native laborers, is seen in the \$5,000,000 exhibit of the cooperating diamond and jewelry interests. Thirty tons of diamond-bearing blue clay from the Kimberley mines were brought from South Africa for the mining demonstration. You have the illusion of descending 1,500 feet to the workings where the Kaffirs are toiling. You see the clay brought up on elevators and the diamonds recovered on the grease tables. A compound, in which the South African native workers live, is background for the diamond pit.

Cutting and polishing of diamonds is shown in a reproduction of a section of Amsterdam, Holland.

In the display of famous gems is the 128.5 carats Tiffany Diamond and the 42 carats perfect blue diamond, formerly one of the jewels of Emperor Maximilian of Mexico.

In other exhibits, modern costume and other jewelry are shown.

Evolution of clock and watch making in the past 400 years is told in an exhibit in which working models illustrate the various improvements. A talking moving picture theatre, seating forty, tells the story of the watch.



The Emperor's Diamond

Present day scientific method of taking the standard time from the stars is explained by lecturers, illustrated by the instruments used for the purpose.

Automatic Machine Makes Tubes

A long range of glittering apparatus making and filling toothpaste tubes shows the tubes starting as metal slugs, the size of a nickel. You see how the slugs are stamped out into long

tubes and the small ends threaded to take the screw cap. The tubes are filled with paste and printed in brilliant colors by automatic process. A mechanical robot explains the operations.

There are exhibits of textiles and women's wear and of trunks and travel equipment.

How shirts and house dresses are made is explained in an exhibit that is a factory unit. Twenty girls, in neat uniforms, are running high-speed power sewing machines around a semi-circle that gives you an opportunity to watch each at her job.

Breeding of silver foxes for their valuable furs is shown in a moving picture. You see the foxes born in captivity in early spring and then transported to 10,000 acres of virgin forest.

In a setting of natural forest background is an exhibit of the furs in their different color phases. A revolving stage shows, on one side, foxes in the woods, and, on the other side, a fashion show of furs worn with various costumes.

Four hundred figurines show the progress of women's ideas of costume from past ages up to now. Forty-four countries are represented. Among the figurines famous women of different times are represented, each dressed as she was in life.

A glass engraver, at work cutting designs, delicate ornament, monograms and other decorations on crystal glassware, is seen in an exhibit of American glassware.

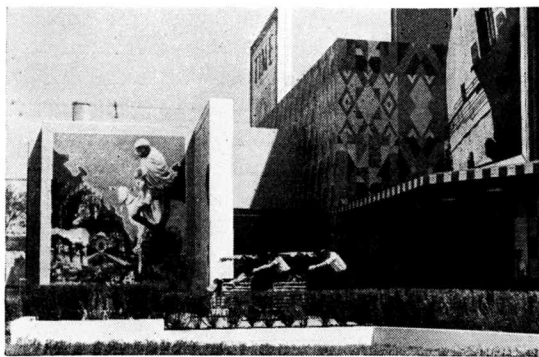
Names of all the exhibitors in the General Exhibits Group will be found in the complete list at the end of the Guide Book.

*Cafeteria in Pavilion 2. No alcoholic drinks.

Exposition bus stop.

TIME AND FORTUNE BUILDING.

Large, lofty ceilinged, air-cooled reading room with many deep, comfortable chairs and 2,000 different magazines from all the world kept on file is maintained by these



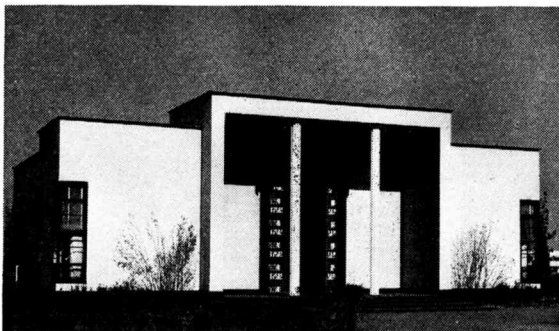
Time and Fortune Building

magazines in their building just south of the Hall of Science on the lagoon side. Two terraces on the lagoon give excellent night view of the Fair and are attractive rest spots.

CACTUS PERGOLA. Rest place beside lagoon.

CHRISTIAN SCIENCE MONITOR BUILDING.

On the lagoon side opposite General Exhibits Building. Air-cooled reading room occupies almost half the 2,600 feet of floor space. In the



Christian Science Monitor Building

foyer a mural painting illustrates the production and distribution of the Monitor. Original stereotype sheets of the first issue are exhibited with a reproduction of the letter by Mary Baker Eddy which authorized the starting of the paper. Other exhibits show the news-gathering and advertising service of the Monitor. Writing and conversation rooms open from the foyer.

CLASSIC MODERN GARDEN. Formal garden, sponsored by Good Housekeeping magazine. Large central pool with four L-shaped pools at the corners, surrounded by shady terraces with numerous benches. A garden house at the south end is illuminated at night, giving a view of the garden as if from a living room.

HALL OF RELIGION

HALL OF RELIGION: Modernistic in design, but distinctly ecclesiastical in its effect, the building was designed by Thielbar and

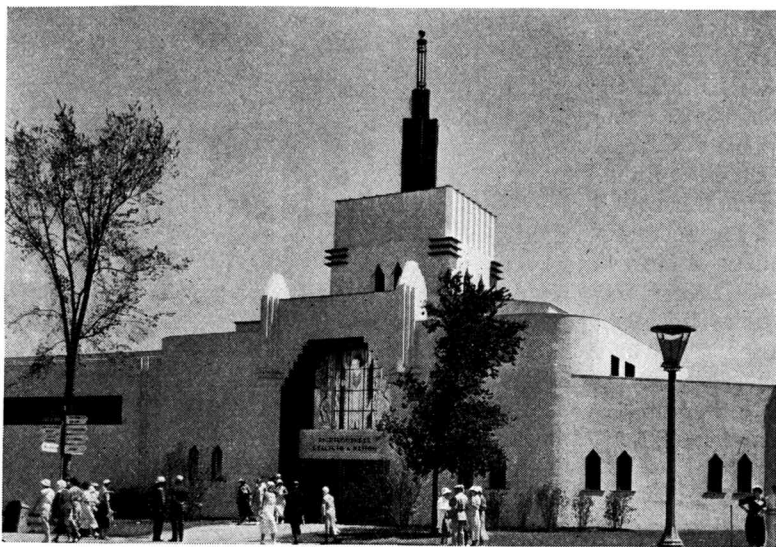
Fugard. The building is 400 feet long and faces east with a beautiful terrace overlooking the lagoon.

Eight large mural paintings surround the entrance rotunda, portraying the aspirations of Judaism, Christianity, Mohammedanism, Buddhism and Confucianism. Greek Mythology, Ancient Persian Religious Worship and the Worship of the American Indian are included.

A lounge occupies the large hall north of the rotunda. Cooperative exhibits of the Presbyterian, Congregational, Methodist and Baptist churches border the room. On the walls are twelve mural paintings representing: Moses, viewing the Promised Land; St. John, viewing the New Jerusalem; Religious teaching in college and seminary, Religious Literature, Education, Peace, Evangelism, Worship, Freedom, Home Missions, Foreign Missions and Philanthropy.

Against the north side of the hall stands an heroic size bas relief of Christ by Lorado Taft.

A small meditation chapel adjoins the rotunda.



The Hall of Religion

Cooperative Publications Exhibit

Modern religious literature of the Protestant denominations is shown in a cooperative exhibit of the publications of the Methodist, Presbyterian, Congregational, Baptist and Disciples churches.

A completely furnished altar stands in the center of the room of the Protestant Episcopal Church of America. Vestments and ritual vessels are shown with historical exhibits.

The exhibit of the Seventh Day Adventists shows the hospital and sanitarium work of this denomination.

Above the National Lutheran Council exhibit is a great mural painting with Christ as its central figure. The motto of the Lutherans passes constantly across the wall in lighted letters: "From century to century the Lutheran Church proclaims her unchanging faith that Christ died for all."

The practical educational program of the Near East Foundation in its emergency relief work is demonstrated by an exhibit of embroideries, rugs, brass, pottery and other work of the students in the Foundation's schools.

In the center of the Jewish exhibit stands a model of the Ark of the Covenant with its scroll. Around the walls are panel paintings representing Justice, Peace, Law, Brotherhood, Sabbath Rest and other Jewish ideals. There is an historical exhibit of antique synagogue vestments.

A statue of Martin Luther is the central figure of the exhibit of the Missouri Synod Lutheran. Mural paintings and charts illustrate the work of the Synod in the United States and abroad.

The Chicago Tract Society exhibits a collection of the religious publications distributed by this organization.

Historic sculpture commemorative of the Mormon hegira to Utah is shown by the Church of Jesus Christ of Latter Day Saints. There is also a model of the Temple in Salt Lake City.

EXHIBIT OF RELIGIOUS PAINTINGS

COLUMBIA COLLEGE CULTURAL EXHIBIT, sponsored by friends of Columbia College, Dubuque, Ia., includes paintings by old masters and other rare objects of art, ancient and modern.

Two portraits of Pope Pius XI head the modern works. One is by Vladimir Shamberk. The other is a replica by Ernst Eindorf of his portrait of Pius XI, painted for the Berlin Nunciature.

The old masters include a "Crucifixion," attributed to Rubens; a "Madonna," attributed to Velasquez; "Human Studies," attributed to Rembrandt; "The Blessed Virgin," of the school of Guido Reni; "Madonna of the Bullfinch," school of Da Vinci; "The Soul of Nature," by Gainsborough; a "Nativity," attributed to Coello, and "The Holocaust," a carving in lava, by Della Robbia. "Androcles in the Lion's Den" is the subject of two studies by J. L. Gerome.

Porcelain and Carvings

Antique paintings on porcelain include a rare "Holy Family" and other works of the Italian school, and a "Chinese Madonna" by a Chinese artist.

Russian icons include rare and elaborate exhibits, one of which is believed to have been a gift by Rasputin to the former Empress of Russia.

Ivory paintings and carvings comprise a group of religious statuettes. A massive Dresden vase depicts Abraham driving Hagar into the desert.

There are mounted shrines in dark oak of Swiss workmanship and a masterpiece in needlepoint embroidery representing, "Madonna, Mother Most Powerful." A mother of pearl carving, of which the original is in the Vatican, represents Romulus and Remus.

Jeweled crucifixes, sacred vessels and reliquaries, carvings in slate and marble, rare works in silver, copper and bronze are included in the exhibit of sacred art objects.

ANTIQUÉ TREASURES

†RELIGIOUS ANTIQUITIES EXHIBITION is at the north end of the building. Here you may see rare and almost priceless treasures of antique art, outstanding among which are a Minoan (Cretan-Mycenean) gold cup, a vase and a ring dating from almost 4,000 years ago, and the Great Chalice of Antioch.



The Minoan Treasures

Elaborate carvings on the golden treasures show them to be products of the Minoan era of Greek culture from 1530 to 1750 B. C. They were discovered in an island tomb in the Mediterranean and are of such rarity that only in the Greek Museum in Athens can similar objects be found.

Their value lies not alone in the metal nor in the beauty of the craftsmanship. The carvings, depicting the sports and

ceremonies of the time, are of great archaeological interest.

The graceful vase, or rhyton, gives two pictures of sporting events. The upper portion shows three powerful bulls being led into the arena by a company of slender youths. Below, two pairs of boxers, equipped with headguards and gloves, are seen entering the ring.

On the cup a body of soldiers and a group of farmers are performing the ceremony of treaty. The slender bodies and plumed hats of the military guards is in marked contrast with the rustic bearing and bulky dress of the rurals.

The ring carries on its engraved bezel a scene from a temple ritual. The high priestess, or goddess, is seen, accompanied by two assistant priestesses. Their costumes show the metal corsets, wasp-like waists and bell-shaped skirts that identify them as Minoans.

The Chalice of Antioch

The Great Chalice of Antioch is one of the earliest relics of the Christian faith.

The Chalice is 7.56 inches high. The inner cup would contain about two quarts of liquid. The outer vessel is of silver, elaborately wrought and standing on a low pedestal. It is made to be a container for the inner cup, a silver bowl of great antiquity.

According to Dr. Gustavus A. Eisen, who was entrusted with the early study and renovation of the vessel, the Chalice probably was executed between years 50 and 90 of the Christian era. The delicate decoration of the Chalice includes two portrait groups of both of which the Christ is the central figure.

One group shows Jesus as mature yet young man, beardless, dignified, clothed in a toga. Below him are Paul and Peter; above, at left and right are James and Thaddeus. Behind Paul is an old, wrinkled man, St. Andrew, brother of John.

The other group shows Jesus as a boy, holding in his hand the scroll of the law on two staffs. Matthew, Mark, Luke and John sit around him and behind Matthew is St. James the greater, brother of John.



The Chalice of Antioch

Surrounding these treasures is a collection of religious treasures of the ages, including mural paintings, stained glass, carvings, statuary, religious portraits, embroideries, vestments, religious vessels and ecclesiastical furniture.

"Last Supper," Carved in Mother of Pearl

‡In a room at the south end of the building a miniature carving in mother of pearl of "The Last Supper" is exhibited. The carving is 30 by 35 inches. It was executed about 200 years ago by an Armenian lapidary, Ivaz Khanbeyan. It represents Jesus and the disciples at the table. Above and behind them is represented the scene of the Resurrection. In order to exhibit the delicate details of the figures the carving is shown under a magnifying glass.

*Restaurant, indoor and outdoor tables. No alcoholic beverages.

RESTFUL GARDEN

AMERICAN RADIATOR & STANDARD SANITARY MANUFACTURING CORPORATION. Displays of plumbing, heating and air conditioning equipment, housed in kiosks scattered through a Spanish garden. The restful setting of sunken and formal gardens, cascades, pools, shrubbery and statuary is a glow of colorful light at night.



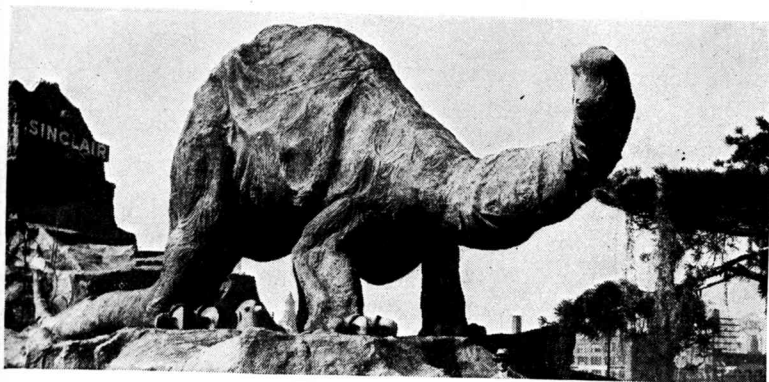
American Radiator Garden

Exhibits of heating, air conditioning and sanitation for all types of buildings, including the largest ships, Pullman cars, etc., are shown. Modern metal wall finishes in kitchens and bathrooms and plumbing fixtures of the newest design are displayed. Among the featured items is the Neo-Angle bath, combining every bathing luxury in a single bath, and a complete line of bathroom furniture.

A completely furnished cottage displays the correct heating and sanitary equipment for the modern home, including a hot water heater and an incinerator.

SINCLAIR MONSTERS

SINCLAIR PREHISTORIC MONSTERS. Giant prehistoric monsters. On the heaped up reddish brownstone hillside of the age of reptiles the forty-ton brontosaurus swings his long neck, jerks his huge tail, clashes his jaws and emits life-like screeching grunts. In a pool a glaring-eyed trachodon, bigger than a hippopotamus, splashes with his huge clawed foot. He is watching a fight between a three-horned triceratops and a tyrannosaurus, most ferocious creature that ever lived, with crocodile jaws and hind legs like a kangaroo. Near



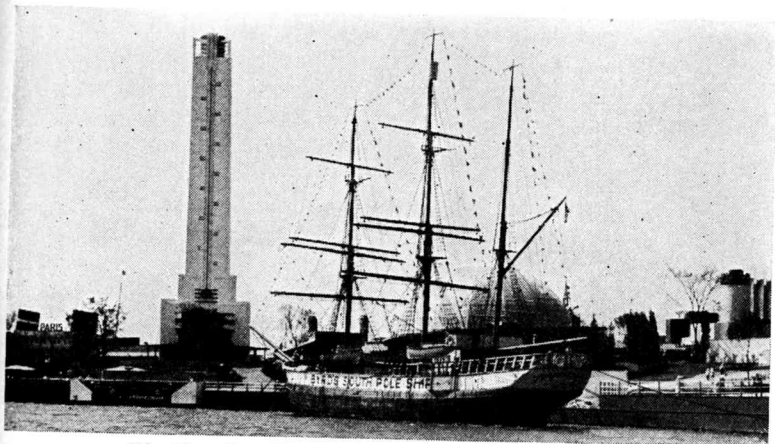
The Brontosaurus

them a stegosaurus, large as an elephant, browses on prehistoric vegetation. Visitors pass through a cave in which are seen explanations of the connection between the age of monsters and the origin of oil deposits.

THE THERMOMETER

HAVOLINE THERMOMETER. The 227-foot high thermometer is the largest in the world and the only one of its kind in existence. In the building which forms the base of the thermometer is a pleasant lounge for visitors.

The thermometer itself is a triangular tower, 218 feet tall, with a thermometer scale on each face. The mechanism by which the colored neon gas tubes of the scale are operated is an ingenious amplification of the power of the infinitesimally small movement of expanding mercury under pressure in a bulb exposed to the outside temperature. As the mercury expands into a capillary tube it



The Havoline Thermometer Tower and Byrd's Ship

actuates electrical power which lights successive sections of the neon tubes up the tower sides.

The tower is sponsored by the Indian Refining Company, an affiliate of the Texas Company. In the lounge will be found explanations of the uses of the various products of the company and its subsidiaries.

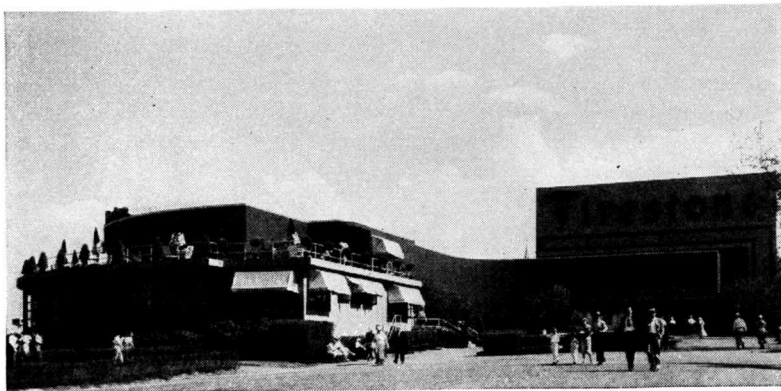
BYRD'S SHIP

†BYRD SOUTH POLE SHIP, the barque, "City of New York," in which Admiral E. Byrd, with eighty-two men, established his base camp, "Little America," on the Ross Ice Barrier from which he first flew over the South Pole, is moored in the South Lagoon on the mainland side. Below her decks, in the hold of the vessel, in the space occupied as sleeping quarters and mess hall on the first Byrd Antarctic Expedition, is a reproduction of "Little America," exactly as it was found by Admiral Byrd on his return to Antarctica in January of this year.

The reproduction of "Little America" on "The City of New York" is 28 feet long by 12 feet wide and was made exactly to scale by the Museum of Natural History of New York. Remainder of the space below decks is filled with a collection of relics of the Byrd Expedition, scientific instruments, food, clothing, and specimens of all the bird and animal life of the Antarctic Continent.

FIRESTONE TIRE FACTORY

FIRESTONE BUILDING. Here you see the most modern type of automobile tire factory in full operation, turning out complete tires ready for your car. Beginning with the bales of crude rubber as they are received from the Firestone plantations in Liberia, Africa, the whole process is carried out, including a demonstration of the exhaustive wear and resistance tests used to determine the best methods of tire construction.



The Firestone Building

The crude rubber is first "masticated" in mixing machines in which are added the additional ingredients needed for tire rubber. Next is the "gum dipping" process by which the tire cords are impregnated. Next the cords are coated on both sides with rubber under pressure in the "calendering" machine. Following operations in the building of a tire educate the visitor in the complex scientific process, last operation of which is the vulcanizer from which the finished tire emerges for inspection and wrapping.

Varieties of tires produced by Firestone are shown in an exhibit hall, together with the tubes, brake-lining, spark plugs, batteries and other automotive products of the company.

†AQUATIC SHOW: Exhibitions of swimming, diving and aquatic sports in an indoor pool. Men and girl champion swimmers give the show.

WALGREEN DRUG STORE. Complete modern drug store.

*Fountain lunch and cafe service.

THE HUB. Store of Henry C. Lytton & Sons, with men's and boys', women's and misses' wear, accessories and sporting goods for sale.

*CENTURY GRILL. Also lunch counter.

*MAYFLOWER Doughnut Restaurant. Tables and lunch counter.

We now turn back, in this guide to the Exposition, and go through Northerly Island from north to south, including the lagoon bridge features, before proceeding further south on the mainland.

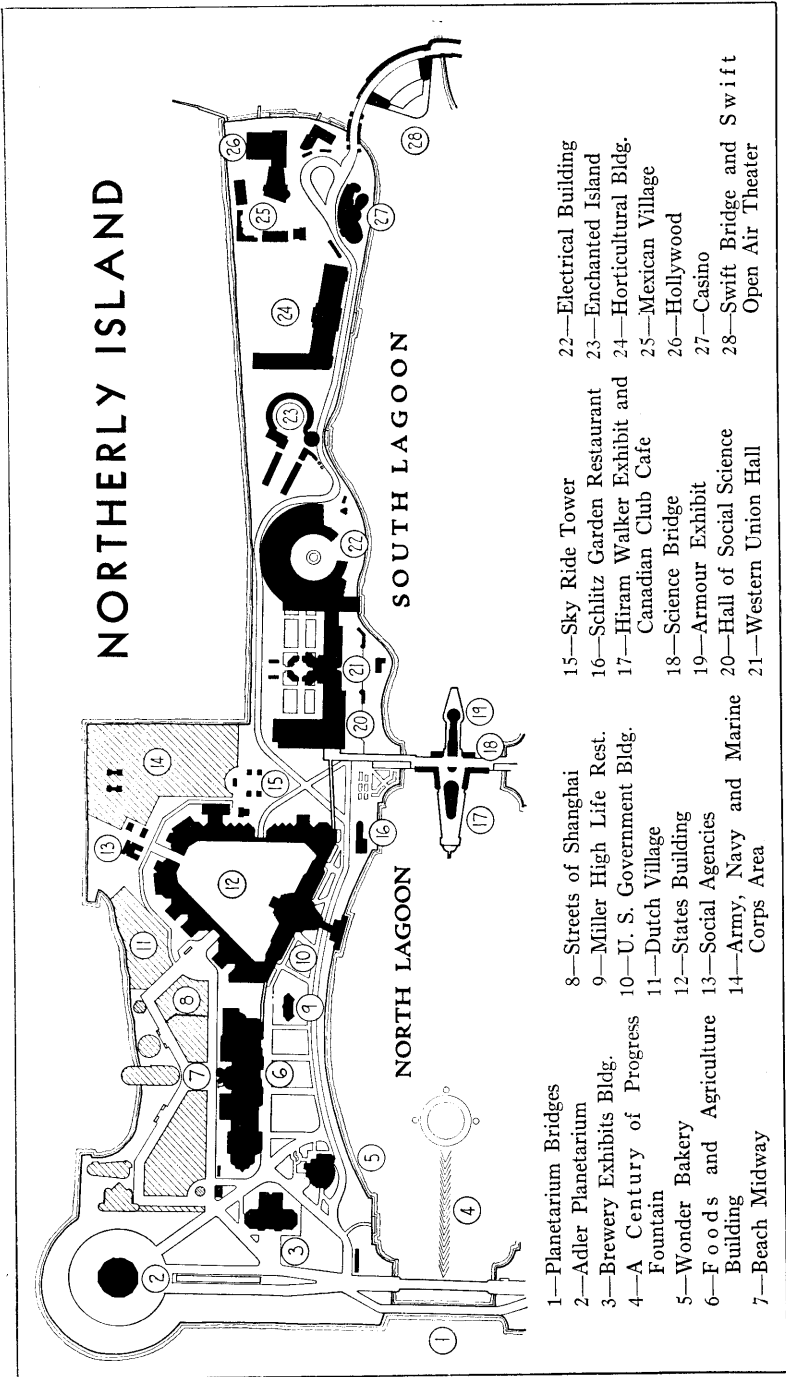
A CENTURY OF PROGRESS FOUNTAIN

Largest fountain ever constructed, extending 670 feet south from the Planetarium Bridge into the center of North Lagoon. Through its outlets flow 68,000 gallons of water a minute, enough to serve a city of 1,000,000 inhabitants. With a Niagara-like roar, the fountain may be heard a half-mile away. Flow of the world's next largest fountain is only 14,000 gallons per minute.

A succession of powerful arching jets leads from the bridge to the water-dome at the south end, 40 feet high and 200 feet in diameter. Three single sprays around the dome throw water 75 feet into the air.

Submarine lights extend the entire length of the fountain, coloring the water green, red, amber, blue or white. Thyatron tubes control the play of light.

Back of the fountain, on the lower level of the bridge, a bank of 40 powerful searchlights can be operated either automatically or manually from a control room in the base of the bridge. The floods of light in changing colors pour above the fountain and blend in the air with spectacular effect. A similar aurora illumination is at the south end of the grounds.



NOTHERLY ISLAND

SOUTH LAGOON

NORTH LAGOON

- 1—Planetarium Bridges
- 2—Adler Planetarium
- 3—Brewery Exhibits Bldg.
- 4—A Century of Progress Fountain
- 5—Wonder Bakery
- 6—Foods and Agriculture Building
- 7—Beach Midway
- 8—Streets of Shanghai
- 9—Miller High Life Rest.
- 10—U. S. Government Bldg.
- 11—Dutch Village
- 12—States Building
- 13—Social Agencies
- 14—Army, Navy and Marine Corps Area
- 15—Sky Ride Tower
- 16—Schlitz Garden Restaurant
- 17—Hiram Walker Exhibit and Canadian Club Cafe
- 18—Science Bridge
- 19—Armour Exhibit
- 20—Hall of Social Science
- 21—Western Union Hall
- 22—Electrical Building
- 23—Enchanted Island
- 24—Horticultural Bldg.
- 25—Mexican Village
- 26—Hollywood
- 27—Casino
- 28—Swift Bridge and Swift Open Air Theater



The Wonder Bakery Building

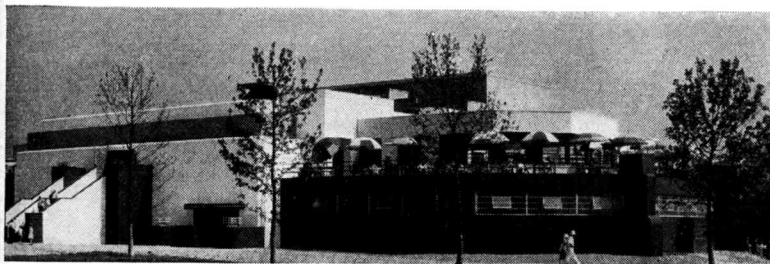
WONDER BAKERY

WONDER BAKERY BUILDING. Demonstration of a modern bakery in operation is given in this building by the makers of Wonder Bread. The story of scientific bread-making is told, beginning with the automatic weighing, measuring and mixing of the ingredients. Mixing machines knead the dough. Loaf sections are weighed and cut and then go into the travelling ovens where they move forward continuously in mechanically regulated heat. Endless belts bring the finished loaves out of the ovens. The loaves move on conveyors to slicing machines and then the sliced loaves are wrapped automatically in moisture-resisting paper, sealed, labelled and loaded into trucks for quick distribution while fresh, without, at any time, being touched by hands.

Dioramas and exhibits show other details relating to scientific bakery food production.

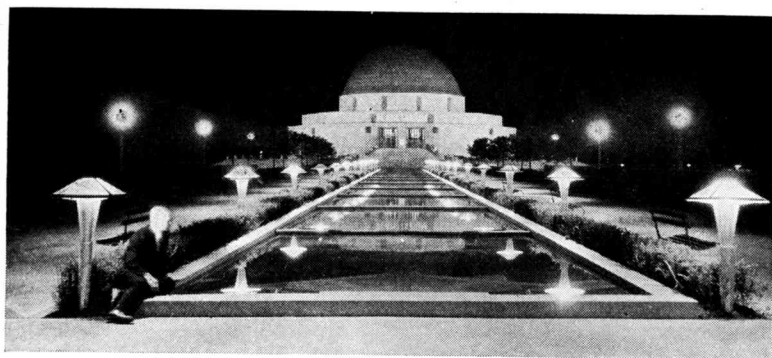
The Clavilux, or color-organ, which plays color effects on a moving picture screen to produce emotional effects similar to those of music, is an entertainment feature of the building.

*Bakery restaurant and cafeteria. Indoors and outside terrace. No alcoholic drinks.



The Brewery Exhibits Building





The Planetarium and Terrazzo Promenade

BREWERY EXHIBITS BUILDING

BREWERY EXHIBITS BUILDING. The story of beer, from grain in the fields to beverage in the glass, is told by exhibits in this building. Pictures, dioramas and working models show the many industries that cooperate in the process.

We see how the grains are harvested and malted, how the hops are prepared. The ancient art of brewing, which was well established in Babylon 6,000 years B. C., is explained and modern brewing equipment exhibited.

There are displays of barrels and bottles to hold the beer, and of bottling machinery to transfer it from the vats to the bottles. Other exhibits show brewery trucks, bars and tavern furnishings, pitchers and glasses.

Adjoining the exhibit hall is a large rathskeller where beer and foods cooked in the German manner are served. A cafeteria occupies the entire second floor, both indoors and the surrounding terraces.

*Rathskeller. Indoor dining room and outdoor tables, specializing in German cooking, a la carte. Orchestra.

*Cafeteria. Second floor dining room and terraces.

PLANETARIUM

†**ADLER PLANETARIUM** and Astronomical Museum is a permanent scientific institution which, by its location on the promontory at the northeast corner of Northerly Island, is included in the Exposition grounds. It supplies the Astronomy section of the basic science exhibits, supplementing those in the Hall of Science. An intricate scientific mechanism, the Zeiss Planetarium projector, provides the spectacle of the heavenly bodies as seen from the Earth. It is the first one to be erected in the United States and one of only a few in existence.

The hourly lecture-demonstrations during the period of the Expo-

sition will show the daily motion of the sky with sun, moon, planets, and stars rising and setting, whirling about the pole; will show the annual motion of the sun with the months swiftly passing and the planets tracing their intricate paths; and finally, there will be an alternative course, either taking the audience to the southern hemisphere to see the southern sky with the Southern Cross, or toward the North Pole to view the Midnight Sun, experience the six months' day and six months' night with the aurora playing above.

Should you arrive during a lecture you may occupy the time in the museum halls by examining the celebrated collection of ancient and modern astronomical instruments. The Planetarium is under the direction of Dr. Philip Fox.

TERRAZZO PROMENADE

TERRAZZO PROMENADE. Approach to the Planetarium from Planetarium Bridge. The esplanade, of brass-stripped terrazzo mosaic, consists of two promenades, each 19 feet wide, between which is a series of shallow fountain basins, each basin in mosaic design depicting a month of the year. The promenade is built by the National Terrazzo and Mosaic Association to remain permanently in its place.

FOODS AND AGRICULTURE BUILDING

FOODS BUILDING. This building, 658 feet long, is an example of the most modern type of exhibit building. Architects are E. H. Bennett and Arthur Brown, Jr.

Displays of foods, both in their raw state and ready for the table, of farm machinery, food manufacturing processes and food distribution, are seen here.

INTERNATIONAL HARVESTER BUILDING

FARM MACHINERY HALL, at the north end of the Agricultural building, exhibits the latest types of tractors, cultivators, corn pickers and other farm machines. A series of dioramas, accurate copies of antique machines and motion pictures depict a century of farm history.

A mechanical cow that moos, moves, breathes and continuously gives milk, is part of the dairy exhibit. A twine-manufacturing demonstration uses transparencies and machines in slow motion to show every operation from the time the hanks of fiber are received from Yucatan or the Philippines until the 8-pound balls are ready for shipment to American grain growers.

A driverless radio-controlled farm tractor is demonstrated in an outside plot just west of the building.

THE FOODS BUILDING

Entering the main exhibit hall, we learn how breakfast food is made. Working machines carry the grain from its raw to finished state. Other features tell the story of biscuits and cereal foods.

A canning demonstration shows the housewife how to can her food at home in tin. Pressure cookers and sealers are also shown. An exhibit of honey and other bee products features a hive of real bees working under glass. A series of photographs of tuna fishing is background for a display of canned tuna and sardines.

Various ways to preserve fruits and vegetables, meats, poultry, game and fish, by pressure cooker, oven, hot water bath, cold pack and open kettle, are demonstrated. A new method of coffee manufacture is demonstrated.

Sugar and salt are the subjects of adjoining exhibits that show how little most of us know about the things we use at every meal. A nine-story open front model of a sugar refinery is one item in an exhibit that tells the history of sugar manufacture. Greatly enlarged crystals of table salt are seen behind a large magnifying glass with transparencies showing other uses for this salt on either side.

A new fruit-flavored pectin is made while we watch, and samples are distributed. Prune juice as a beverage is featured in a display of prunes and apricots, fresh and packaged.

Automatic Soft-Drink Bottling Plant

Beneath a crystal waterfall, a bottling unit demonstrates the completeness of automatic production. Bottles in rows go through five baths in caustic soda solution and four rinsings and are then conveyed to two revolving fillers. As they travel around the smaller circle, each gets a shot of syrup and steps aboard the larger circle to be filled with carbonated water, capped and taken away on the conveyor.

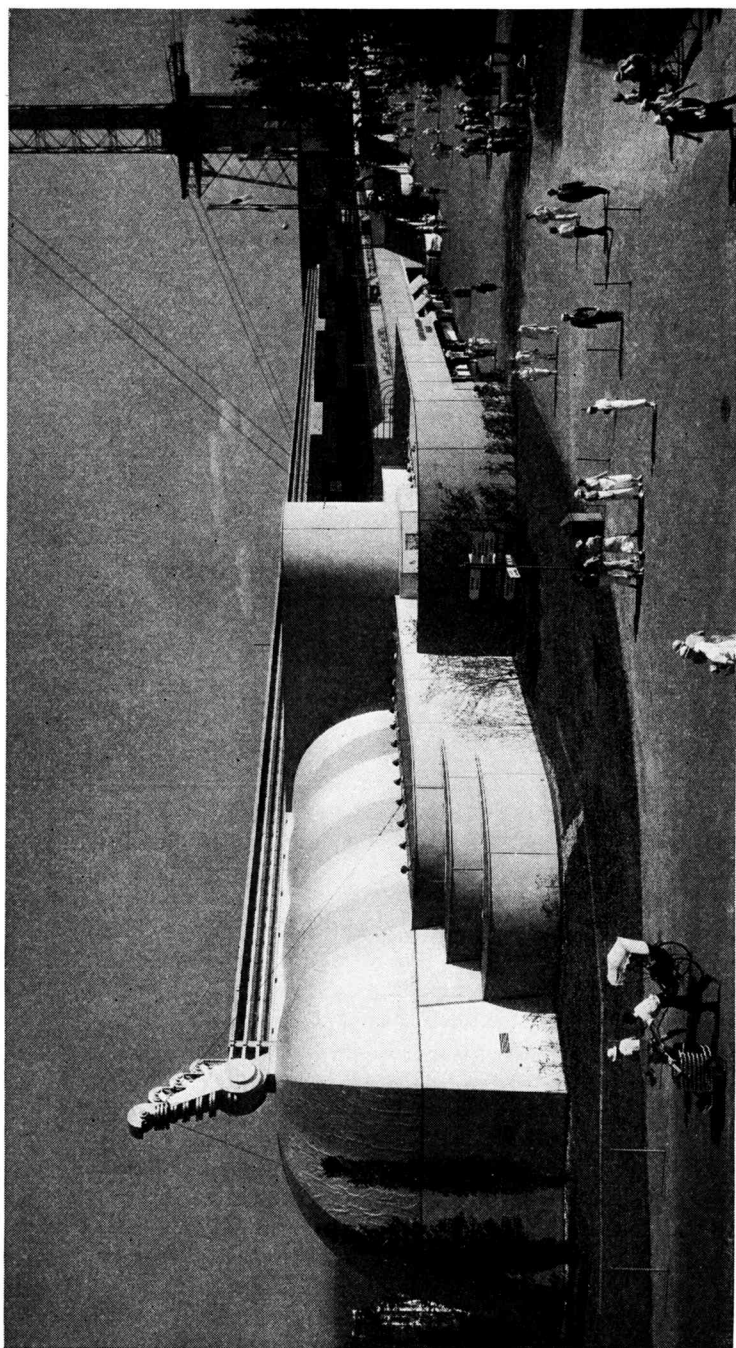
The unit fills 148 bottles per minute and is tended by three inspectors—a man who examines the bottles for chips as they come out of the washer, and two girls who look through magnifying lenses at the passing parade of filled bottles.

Gaily covered murals of hop pickers at work in the Bavarian hop fields cover the walls of an inviting lounge.

WILSON COMPANY EXHIBIT, ROOF GARDEN AND TERRACE

A mechanical bacon slicer with a capacity of 1,000 pounds an hour is shown in action. Girls in spotless uniforms wrap and pack the bacon as it flows from the machine.

A display of packing house products includes soap and cosmetics, gelatine, insulating materials, glue and tallow, as well as animal and poultry foods. Above this exhibit are a second floor terrace restaurant and a third floor roof garden.



THE FOODS AND AGRICULTURE BUILDING

Under a dome in the center of the building a scientific demonstration shows the effect on the human system of coffee in different conditions. Packaged coffee and other food products are exhibited.

Demonstrators illustrate a simplified method of making fancy-shaped patty shells, waffles and similar dainties. Glass coffee makers and a visible high-speed electric broiler are shown. There are demonstrations of a stain remover. A new type of cooker, developed in Germany, is seen in operation.

In a spacious lounge, visitors may rest or examine a collection of old books on the subject of food production.

Foods from Foreign Lands

Fish from Alaska, olives from Spain, pineapples from Hawaii, fruits from California, beef and dairy products from all parts of America, gathered for distribution to the world's dinner table, are shown with an illuminated world map. There is a recorded voice accompaniment and seven dioramas of farm and fishery scenes. Smartly uniformed girls demonstrate the art of packing stuffed olives into glass jars.

Jars of almost every conceivable kind of preserves, from apple jelly to rattlesnake meat, are displayed in an exhibit of home canned foods entered in the 1933 International Home Canning Contest. Jars from every state in the Union and from nearly every foreign country are included.

In a glass oven, central feature of a candy-making demonstration, nut-meats are baked like potatoes and when done are taken out and buttered, also like potatoes. This process replaces the customary method of boiling nut-meats in grease. Across the aisle, girls show how easy it is to make ice cream and gelatine desserts at home. We may watch food being cooked in a new type of pressure cooker.

"Untouched by human hands," Philadelphia cream cheese is manufactured, wrapped and packaged by automatic machinery. The display is enclosed in plate glass so that every operation is clearly visible. Nearby is an exhibit of models showing the latest developments in automatic merchandising machines.

Grain is literally shot from guns in an action display of the manufacture of a cereal breakfast food. A colored mammy making pancakes and a kilted Scotch lassie baking scones, demonstrate two uses of cereal products.

Story of Spices

At the top of the next exhibit is a huge reproduction of a bottle of salad dressing. Into it on one side march natives carrying spices, and out of it on the other side come mammoth salads, sandwiches and other foods that may be prepared with the dressing. Fifteen dioramas, cut into a map of the world, show where and how the

spices are obtained. In a lounge at the back, pictures painted in oil on velour depict the story of spices and other foods.

Maple sugar from tree to table is the subject of a display of maple sugar products. A scientific display shows the farmer how to test his soil for acidity or the presence of phosphates, so that he may know how to treat it to secure the maximum productivity.

ILLINOIS AGRICULTURAL BUILDING

Efficient farming is the theme of the exhibit of the agricultural department of the University of Illinois. A forty-foot relief map shows a typical quarter section farm 100 years ago, 50 years ago, and today. The farm of a century ago included sixty-one acres of timber and twenty-one of swamp. Fifty years later, the farm had been ditch-drained but the soil was being worked out. In its present state the land is tile drained, the stream straightened, fields laid out in equal sizes for crop rotation, and buildings planned for business-like operation.

Contrasting rows of small, feeble corn and tall, luxuriant plants show the benefit of fertilization. A model cattle feeding area is shown, with recommendations for the crops and space required for beef growing. An uneconomical, muddy hog field is contrasted with the grass pasture and clean buildings required to rear swine profitably.

Restaurants in the Agricultural Building:

*Swedish Produce Lunch Counter. Scandinavian foods and beverages.

*Wilson Terrace, on the second floor, and Wilson Roof Garden. Steaks and chops are specialties.

*Polly Grill. Lunch counter.

*Billboard Grill. Indoor, self-service, featuring plate lunches and hot sandwiches. Lunch counter.

*MILLER'S HIGH LIFE RESTAURANT. Table d'hote and a la carte service. Indoor dining room and outdoor tables. Sea foods a specialty.

BEACH MIDWAY

MIDWAY. Amusement center of the Exposition, where brilliant color mingles with blaring sound to form a fitting background for the happy faces of carefree merrymakers. Here, along the wave-lapped shores of Lake Michigan, are gathered together all the time honored features of the carnival, modernized with myriad improvements from the laboratories of science and dressed in the latest creations of modern art.

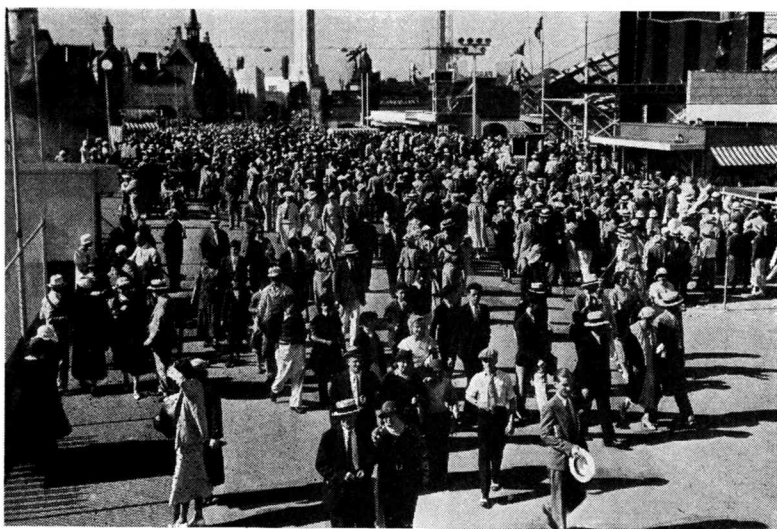
Here, too, are thrilling rides, "dangerous, daring and death defying" if the seductive shouts of the barkers are to be believed. But every feature is equipped with the most modern safety devices.



The Beach Midway

†At the entrance stand two Ferris Wheels. Nearby is the Forte Slide where mats are provided for the journey down a spiral causeway around the outside of a towering cone.

†Around the Auto Scooter we may bump others from their course and attempt to keep from being bumped ourselves. In King Solomon's Temple is a model of the original temple and a lecturer



Along the Midway

explaining its marvels. Here are also housed the Mechanical Circus, a miniature three-ring circus, complete from elephants to clowns and all mechanically operated; and the Freak Animal Show, comprising some 30 animal monstrosities.

†If you can hit a target with a baseball, you will drop the Swanee River Boys into a pool with a fierce-looking mechanical alligator. A Shooting Gallery with moving targets is near.

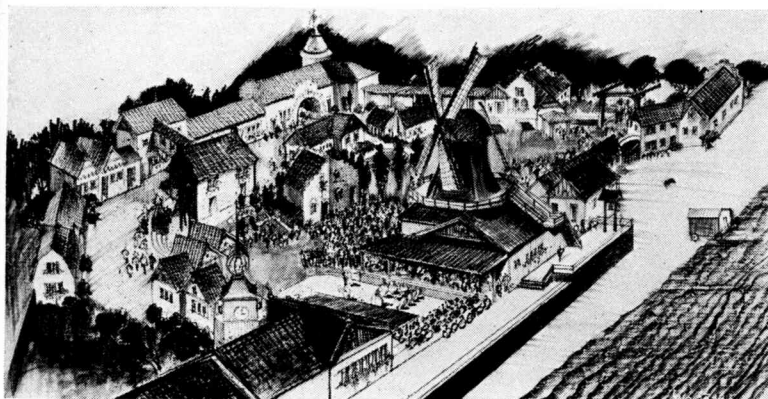
†At the Animal Fair, 500 lions, tigers, monkeys and other animals and reptiles are exhibited in their native settings. No bars interfere with your view of these jungle beasts, which are behind a wide moat. Frank ("Bring 'em back alive") Buck and a corps of native helpers will describe the animals. Many of them were actually captured by Mr. Buck, and have been seen in his motion pictures.

†Children may guide the Winston Racer automobiles around a curving walled track. Near are the galloping chargers and glittering chariots of the Carousel.

Down Lost River

†A trip down the Lost River takes us in an explorer's boat to the world of a million years ago. Through a waterfall we go straight into a mysterious jungle. The 80-foot brontosaurus is the first of a host of animated prehistoric animals we encounter during the journey.

†The Torture Show exhibits man's ingenuity through the ages in devising ways of punishing his fellows. The World Beneath—an illusion show—takes us for an imaginary excursion into the bowels of the earth.



The Dutch Village

†The Bug Ride is a wavy trip inside a canvas caterpillar over a circular track. The Catapult, a flat ride, spins us around and around in our round basket car. The all-steel frame of the Cyclone Coaster insures perfect safety during its breath-taking dips.

†In the Motordrome motorcyclists defy death by riding up the side of a steep wall.

Villages

†DUTCH VILLAGE. Realm of windmills, dykes, tulips and canals. This reproduction of a typical Netherlands fishing village contains a large windmill in full operation, a canal running through the streets and a drawbridge such as is seen only in Holland.

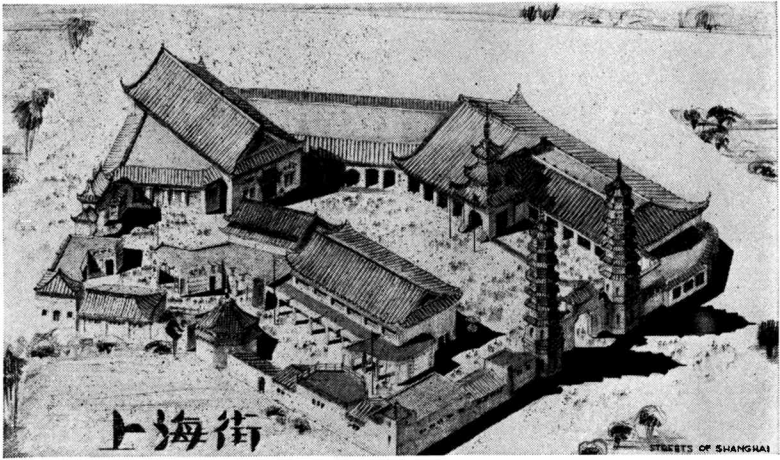
Visitors may first view a Holland farm house with its immaculately kept cow-stable opening into family living quarters. Here they can see trim tile-lined mangers for the cattle and appointments that seem good enough for human guests.

Out of doors, the eye meets a riot of colors—rich blues, vivid greens and magenta, with red tile roofs and shutters of brilliant hue. Red-coated Edam cheeses are manufactured and marketed by villagers in boats floating through the canals of the picturesque community.

*Dutch restaurant. Table d'hote and a la carte. Indoor and outdoor. Orchestra and dancing by guests.

†STREETS OF SHANGHAI. Pagoda towers, eight stories high and painted in brilliant hues, mark the entrance to this colony of typical Chinese buildings of bright Mandarin red, jade green, loud Chinese yellow, blue and gold.

The streets of shops and theaters are lighted by thousands of bright-colored Chinese lanterns. Within the shops are rare silks, jades, bronzes and porcelains, sent from San Francisco's "China-



The Streets of Shanghai

town." Visitors may watch a noodle factory in full operation and learn how bean sprouts, indispensable ingredient of Chinese cooking, are grown.

Native merchants and craftsmen are seen at work. Every employee of the village is garbed in native costume to keep the Oriental atmosphere intact.

An art gallery displays old Chinese masterpieces and a model of a temple to Confucius. In booths, Chinese artists will sketch portraits of visitors.

*Chinese restaurant, indoor and outdoor. Table d'hote and a la carte. Also cafeteria. Orchestra and dancing by guests.

Other Midway restaurants:

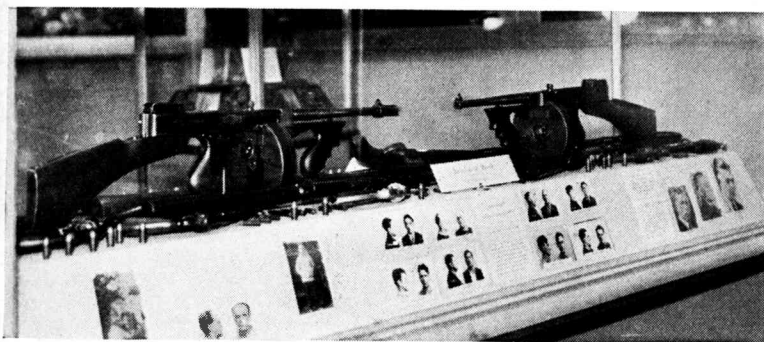
*MIDWAY BEACH CAFE—a la carte. Indoor and outdoor. Orchestra, dancing by guests, 6 p. m. to closing. Floor shows, 9 p. m. to closing.

*MEXICAN NIGHT CLUB. Mexican orchestra, dancing by guests and a floor show of Mexican talent.

U. S. GOVERNMENT BUILDING

U. S. GOVERNMENT BUILDING. Together with the connecting States building, the Government building is a striking example of the new architecture. Designed by Edward H. Bennett, the structure consists of a central dome surrounded by three pylons representing the three branches of government: Executive, Judicial and Legislative.

Here Uncle Sam reports to the public on what the Federal Government is doing for its citizens.



Used by Post Office Bandits

Entering the building by the central ground floor entrance, we find the alcove of the Post Office Department on the left. Displayed statistics show its growth. Starting with 75 post offices in 1789, the number increased to 10,127 in 1833 and is 47,642 at this time.

An enticing gold brick, worth—if genuine—\$30,000, lies on a velvet cushion to show how the Post Office hunts down swindlers using the mails. Card painting and embroidery outfits sold by “earn money at home” swindlers, and samples of form letters with which they refuse to accept any of the work done, are part of this instructive display.

Tragedy underlies the exhibit of quack remedies stamped out of existence by the Department.

Machine Guns and Dead Letters

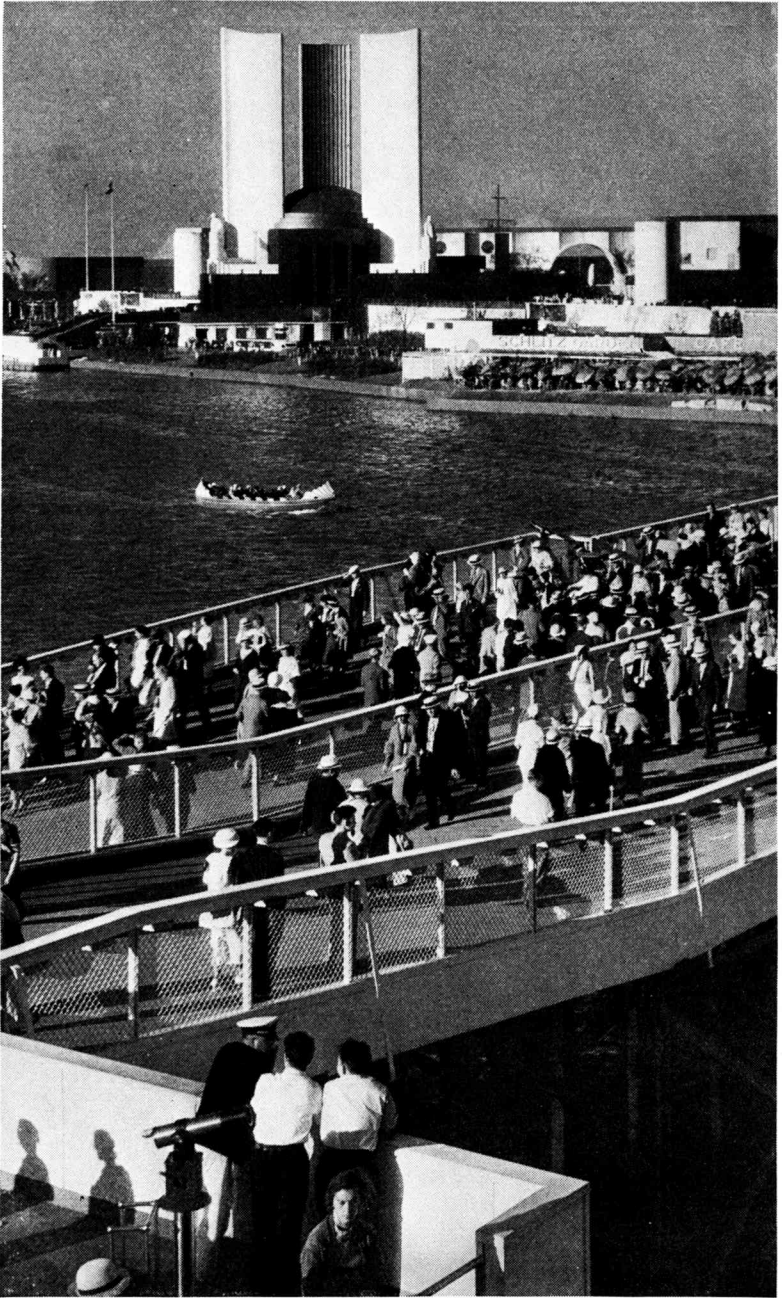
There is a case of machine guns and revolvers with rogues' gallery portraits of mail-car bandits captured and convicted. Figurines of Christ on the cross between two thieves, all enclosed in a quart bottle, are part of a museum of strange articles found in packages in the Dead Letter Office.

The Great Seal of the United States, reproduced in colors, is the central figure of the State Department exhibit. A collection of historic documents includes the peace treaty with Great Britain signed in 1783, and the treaty with Germany.

Three murals shown by the Office of Education portray the school of yesterday, today and tomorrow.

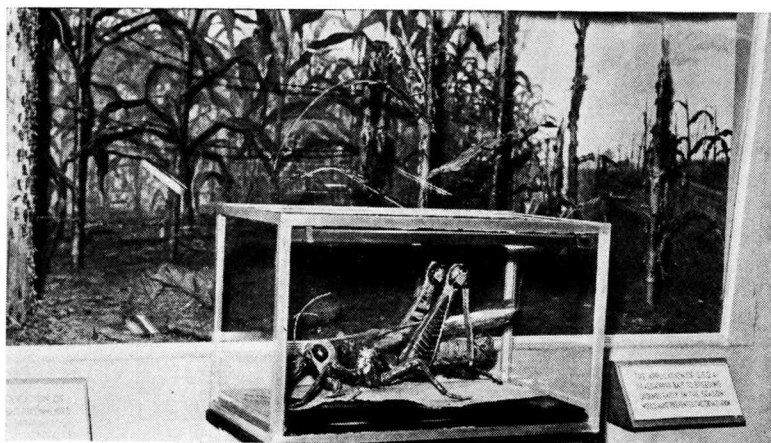


In the Game Conservation Exhibit



U. S. GOVERNMENT BUILDING FROM SCIENCE BRIDGE

[76]



The Farmer's Foe

Western yellow pine logs, four feet thick, with a quarter hewn out to form benches with backs, invite visitors to rest in the space of the National Parks Service. There we see a glacier—the Nisqually—on the side of Mt. Rainier in a lifelike diorama.

A model of Boulder Dam in its mountain setting, shows surplus water from the lake rushing down through the dam's spillways and spurting out in jets into the canyon below.

Baskets and trays, rugs, pottery and jewelry are shown in the Indian Affairs exhibit to illustrate the arts and crafts of the Indian school system.

In the Hawaii exhibit is the entrance to a grass hut. Large coconuts are piled near a wooden mixing trough, polished glistening brown by use and with two grotesque carved heads for handles.

Game Conservation

Deer and wild fowl, in a natural forest background, illustrate game conservation. A model of a forest in a continuous rainstorm shows the great sponge formed by the earth and root mass underground preserving the water.

The Department of Agriculture occupies a large space to exhibit the high lights of its important work. Before a natural size cornfield, with real stalks and ears, are grasshoppers so thick they hide the wood on the fence posts, ready to move in and destroy the crop.

Soil chemistry, terracing and contour ploughing to control erosion, how to pack apples, food inspection, agricultural engineering, how to breed and feed animals, dairying, economics of marketing, price analysis, standards of products and management of income, are subjects of exhibits.

Measure the Weather

Stop at the weather map and try the apparatus on the table.



Making Money

Touch a button and lights show the direction of the wind while the anemometer records its force. Touch another button and read the intensity of the solar radiation at the moment.

How the government helps its unemployed citizens in their search for work is demonstrated in a model office of the U. S. Employment Service, which was established in 1933.

Here we see how the applications of unemployed men and women are handled, and the efforts made to find suitable jobs for them. The workings of a central clearing house through which each employment office is kept informed of labor conditions in all parts of the country, are shown, as are the special veterans' and farm placement services.

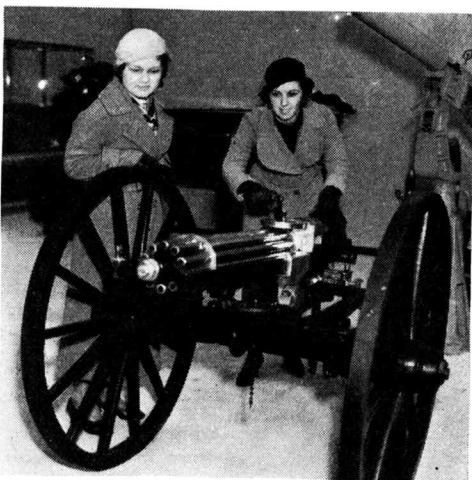
Other Department of Labor exhibits show how the department supervises alien immigration and naturalization, mediates labor disputes, collects and distributes information on all subjects connected with labor, and otherwise fosters the welfare of wage earners.

Exhibits of the Children's Bureau show the government's activities in behalf of child welfare, through supervision of orphanages and juvenile courts, control of employment of boys and girls, and studies of the causes and treatment of children's diseases. The Women's Bureau demonstrates its work.

Brilliant blue and white panorama of pictures of merchant vessels in the Shipping Board exhibit is background for the figures that 83.8 per cent of our foreign trade was carried under the American flag in 1833. In 1903 the proportion was down to 9.6 per cent and now it is 34.7 per cent.

The Veterans Administration exhibits baskets, leather work, silver, tableware, carvings and

other work of patients in occupational therapy. Maps and statistics tell the story of the work.



The Gatling Gun

How Airplanes Are Tested

Working model of the largest wind tunnel in the world, that at Langley Field, Virginia, which can test a full sized airplane, is in the show of the National Advisory Committee on Aeronautics. A working model, twenty feet long, shows the operation of the 2,040 foot tank at Langley Field used to test a plane's behaviour in water.

Wood cuts of the Government Printing Office in 1861, when it was established by Congress, are contrasted with half-tone illustrations of its modern work-rooms and machinery today in the exhibit of this department. Displays of ink and papermaking, fine book binding and typography are shown.

The U. S. Army exhibit is purely of peace projects of the Army Corps of Engineers. Diorama relief map of the bend of the Mississippi river at Carruthersville, Mo., shows various types of embankment, concrete dikes, pile dikes, rip-rap bank and grassed levee.

Large model of a lock dam on the Ohio river uses real water. A center of interest is a huge relief map of the proposed Nicaragua canal.

Playful pink and green lizards, six inches to a foot long, scamper around a section of desert reproduced by the Smithsonian Institution.

Rare volumes and Braille books for the blind are shown by the Library of Congress.

The exhibit of the Bureau of Prisons simulates a prison cell, with bars and heavy doors enclosing its space. Models and photographs show how Uncle Sam cares for his involuntary guests.