SCIENCE NEWS

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THE PLANETARIUM

WITH the vanguard of the thousands of American tourists who will visit Germany during the coming months now reaching Berlin, the planetarium is attracting large crowds. Many of the Americans wish to see in operation this device that reproduces the night sky on a white dome, and which will soon make its debut in the United States when one is installed in Chicago.

Since the first planetarium was erected in 1924 in Jena, on the roof of one of the buildings of the Carl Zeiss optical works, its manufacturers, fourteen other German cities have installed them, including Munich, Berlin, Hamburg, Hanover, Dusseldorf, Barmen, Leipzig, Stuttgart, Nuernberg and Mannheim. One has been installed in Vienna; Mussolini has ordered one for Rome, which will be opened this fall; while the Soviet Government has also ordered one for Moscow.

The planetarium is a huge instrument, consisting of a long cylinder, with two spherical ends. Imbedded in the spheres, and also along the cylindrical parts, are a number of lenses, 119 in all. These act as magic lanterns to project the images of the naked eye stars, the Milky Way, the sun, moon and planets on the white cloth-lined dome. So realistic is the effect that when the room is darkened and the visitor has become used to the dim light, the stars appear as in the actual night sky. The visitor does not seem to be in a 90-foot dome, but under the stars themselves on a cloudless night.

The mechanism of the machine, all controlled by the lecturer from a single switchboard, will enable it to reveal the stars as seen from the North Pole, the South Pole, or any place between. The "great year," of 26,000 ordinary years, can be duplicated in a few minutes, and the heavens shown as they appeared thousands of years ago. Five thousand years ago our present pole-star was not in that prominent position, but it was occupied by the star we call alpha Draconis. At that time also, the Southern Cross was visible from the present latitude of New York. This can be shown with the planetarium. When desired, the names of the constellations can be flashed on the sky in the proper places, as if on huge electric signs!

The phases of the moon as it spins around the sun, along with the earth, are displayed. So are the motions of the planets. These can be speeded up so that the events of a year take place in a few seconds. The sun speeds across the dome with Mercury and Venus looping around it. The alternate forward and backward motion of Jupiter and Saturn, hardly visible in reality because of their slowness, become immediately apparent. Yet so accurate is the mechanism that, if the planets are shown as they would appear 5,000 years hence, Mercury, the fastest moving of them, is out of its proper place less than the diameter of the full moon.

Most of the German planetariums are operated by the school boards of the respective cities, but for general visitors an admission charge of one mark is usually made. Despite this, the popularity of them has been so great that in the four years since the first one more than a million paid admissions have been recorded in Germany. This has gone far towards paying the cost. The instrument itself sells for about $40,000, and the cost of the building is from about $150,000 upwards.

By this time next year, Chicagoans will be able to see, without leaving the city, the first planetarium in the western hemisphere. Max Adler, former Sears-Roebuck official, has just given $500,000 to the city for one of these instruments and the building to house it. An island in Lake Michigan, near the Field Museum, has been selected as the site. Mr. Adler will shortly leave for Germany to study the instrument at Jena, home of the Carl Zeiss optical works where it is built, as well as other German cities, and will personally supervise its erection in Chicago.

RECENT INDIAN MOUND-BUILDERS

THE last traces of the old idea that the mound-builders were a mysterious ancient race who vanished before the coming of the Indians have been very effectually destroyed by the discovery in Joliet, Ill., of a mound filled from bottom to top with the skeletons of buried Indians, each skeleton provided with funeral gifts of European manufacture as well as the more usual stone, bone and shell objects of native workmanship. Professor Fay-Cooper Cole, of the University of Chicago, states that so far as he is aware this is the first wholly post-European mound discovered in this country.

The mound is one of the so-called Fisher group, which have been subjected to excavation during the past few years by George Langford, a factory executive of Joliet. The other mounds have yielded Indian relics of pre-European date, one of the cultures represented being very primitive and possibly very ancient. A few articles of white man's manufacture were found near the top of one of these larger mounds, linking the history of the Indians of this region with that of French Colonial trading in the Mississippi Valley.

The mound which Mr. Langford has just finished exploring had been given a somewhat superficial going over by an earlier group of amateur diggers, who found a considerable number of silver objects, including a crucifix, several spoons, bangles and other ornaments. It was thought that everything had been removed, but when Mr. Langford dug into the mound again he discovered that the previous excavation had done little more than remove the surface. He found burials with European and Colonial funeral gifts throughout the mound and down into the ground to a depth of five feet beneath its base.

The finds include a couple of brass pots in excellent condition, one of them with a close-fitting lid, a pair of scissors, a large number of knives bearing a French trademark, several silver spoons and quantities of beads, but-

tons, pins and other trinkets. Brass seems to have been a favorite metal; every skeleton had some brass object with it. These modern mound-builders unquestionably did a lot of business with the French traders.

One of the most remarkably well-preserved specimens is a combination pocket compass and sun-dial in a brass case. The "floating" compass card swings freely on its pivot, the glass cover is unbroken, and the gnomon of the sun-dial can still be turned on its hinge.

A change in the type of burial may possibly be due to European influence. All the adult skeletons in this post-European mound lay flat on their backs, heads west, feet east. This resembles the white man's method of burial. All the other deep burials at the Fisher site, whose funeral gifts do not include European objects, were turned over on one side and drawn up into a crouching position, as primitive peoples are wont to sleep in cold weather.

ARCTIC EXPLORATION AND THE "ITALIA"

GENERAL NOBILE'S *Italia,* now down in the Arctic, was too small and slow for serious Arctic exploration, and German authorities warned him against using it. This is the opinion of Dr. Walter Bruns, general secretary of the International Society for the Exploration of the Polar Regions by means of the Airship, generally known as "Aeroarctic." The society is particularly interested, as several of its members are with the Nobile expedition. Also, Aeroarctic is itself planning extensive polar explorations next year in the *LZ–127,* the gigantic Zeppelin now nearing completion at Friedrichshafen. This ship is six times as large as the *Italia,* and even larger than the American *Los Angeles.*

"In spite of its great sympathy towards the undertaking," said Dr. Bruns, "the Aeroarctic has had, from the very beginning, serious concern regarding the expedition. It was pointed out to Nobile that, after the wonderful flight of the sister ship *Norge,* too distant a goal for a new expedition this year should, before all things, be avoided for this very small type of airship. We know from our Berlin conferences with General Nobile that, because of the small size of the airship, the mass of the necessary reserves of ballast (in case the ship were covered with ice), and the polar equipment requisite for a possible forced landing, had to be reduced greatly on account of the great distance.

"The small speed (about 53 miles per hour) of the airship required that General Nobile spend the month of April and the first half of May, the most precious time for polar work, awaiting favorable meteorological conditions. Already the flight to Nicholas II Land (Leninland) had demonstrated that it was really too late for further undertakings because of the prevalence of summer fogs. In addition to the unpromising meteorological conditions, General Nobile had to fix the base of his operations at Kings Bay in the Arctic itself, owing to the small radius of action of his airship. This again made him not only dependent upon the general weather conditions but also upon the local storm phenomena (winds, snowstorms, etc.) which are often very troublesome. The snow even penetrated the hangar and made it very inconvenient for the airship in its shelter.

"The very favorable flight to the Pole justified the hope that the return trip would likewise be propitious. Under good weather conditions, the journey from Kings Bay to the Pole and back is no great undertaking for an airship. This, however, is not the case, in view of the small speed of the *Italia,* as soon as a moderately strong contrary wind arises, as apparently took place on the return trip. That General Nobile on approaching Spitzbergen met with strong adverse winds is, from a meteorological standpoint, not strange, since the region of Spitzbergen is in the area of storm paths which take their course from the North Atlantic along the Norwegian Coast and only gradually die out in the inner Arctic, *i.e.,* become less dangerous for flights.

"Our society has, therefore, as is generally known, held firmly to the opinion that the solution of Arctic problems should not be attempted with too small an airship. In order to be independent of the especially unfavorable storm conditions of Spitzbergen, one should, before all else, establish his base for Arctic exploration as far distant as possible from the Arctic. For this reason we plan for next year's expeditions, anchorages in Leningrad, and perhaps at Murmansk in Kola, and at Nome in Alaska. We wish also, in spite of the very great cruising radius of the new Zeppelin-airship which may be three times that of the *Italia,* to establish anchorages on both sides of the Arctic in order to be approximately independent of meteorological factors during our journeys covering several days."

TUBERCULOSIS

THE need for careful supervision of tuberculosis patients discharged from sanatoriums as cured was described as an economic as well as a sociologic need by Dr. H. Longstreet Taylor, of St. Paul, in the presidential address before the annual meeting of the National Tuberculosis Association which opened in Portland, Oregon, on June 17.

Every relapse doubles the original cost of the care of the patient, a burden that generally falls on the community at large, said Dr. Taylor. A third period of treatment, the "cure to end the cure," was recommended as having but trifling cost compared to that of caring for relapses. Figures from the Metropolitan Life Insurance Co. showed that of 896 patients who had this after-care, 80 per cent. were at work seven years after discharge from the sanatorium. On the other hand, a survey of unsupervised patients in New York City revealed that 52 per cent. had suffered relapses within one year after leaving the sanatorium.

Of 148 cases of pulmonary tuberculosis during the last seven years in which surgery was used, 41 per cent. were cured and 33 per cent. improved, Dr. William H. Thearle, of Denver, reported to the meeting of the association. By this method of treatment, known as thoracoplasty, part of the ribs are cut away. The lung collapses, so that it is completely at rest and thus has a chance to heal. The results with this method of treat-

ment were characterized as "brilliant" by Dr. Thearle. However, proper selection of cases for this procedure is of great importance and further progress along this line will depend on the degree of cooperation between internist and surgeon.

The task of the industrial physician in determining whether or not a worker contracted tuberculosis as a result of his occupation, and was thus entitled to compensation, was described and difficulties pointed out to members of the association by Dr. John B. Hawes, 2nd, and Frank Kiernan, of Boston. In eleven of 76 cases considered by the Industrial Accident Board of Massachusetts during the last two years, there had been direct exposure to tuberculosis for many years through another member of the family.

Present training for public health work is of three types. The first is the standard nurses' training, the second supplements the nurses' training with a period of training in social work, the third adds to the training of nurse and social worker such academic and cultural training as may be obtained by a regular college or university course and finishes with specialized training for research in social health work. This last type is still in the experimental stage and all the types are constantly undergoing change and improvement, members of the association were told by Dr. Philip A. Parsons, of Eugene, Ore.

Light is a valuable factor in the cure of tuberculosis, but it must not be considered as the sole agent. There are other and more important ones, such as diet, rest and fresh air, Dr. Clarence L. Hyde told members of the National Tuberculosis Association at their meeting. "Heliotherapy is much more than a bath in sunlight," said Dr. Hyde. Treatment with artificial lights, while it may reproduce the rays, can not equal actual sunlight treatment which is accompanied by changing air currents, differences in atmospheric temperature and humidity, and constant variations in the sunlight itself. These features all have importance in the value of sunlight treatment. A method of using an open flame carbon arc, which Dr. Hyde considered the most satisfactory substitute for sunlight, was described.

ITEMS

A HOUSE without a single sliver of wood in its construction is being built in Gary, Ind., for the president of a local steel company. The framework is made of angle-irons with a complete system of diagonal bracing. Both bolting and electric welding is used to fasten the steel together. Concrete is used in the foundation and for the floors, while stairs, sills and interior trim are all steel.

THE quantity of water underground, beneath the crust of the earth's surface, is nearly one third the total volume of the oceanic waters, according to estimates of Dr. Chester A. Reeds, of the American Museum of Natural History, who has just completed investigations of buried rivers and caves. The earth's ground water extends to great depths, perhaps six miles, and has been accumulating for countless ages. This great mass of water percolates slowly through the porous and jointed rocks to form great systems of underground drainage, creating such beauty spots as the Mammoth Cave, in Kentucky, and the Endless Caverns, in Virginia. In the limestone regions, where so many of these unfamiliar streams are found, the formations of huge stalactites, stalagmites, columns and stony curtains in the cavernous depths remind one of the artistic handiwork of ancient artisans on the Renaissance palaces.

WHETHER or not flowers will reproduce may be traced to the size and general appearance of the pollen grains, according to a report to the western division of the American Association for the Advancement of Science. Miss Laura E. Shaw, of the University of Southern California, separated pollen grains into four groups according to size and found that the third group, containing grains of from three to four thousandths of an inch and comprising half of the grain studied, gave the highest percentage of germination, the rate being 75 to 80 per cent.

FOOD is digested, absorbed and made available for doing the body's work just as effectively when liquid petroleum is added to the diet as when inert laxative oil is not taken with the food, according to a report to the American Medical Association by Dr. Alfred B. Olsen, of Battle Creek Sanitarium, who reported experiments on dogs and human beings.

THE hard-worked liver diet is to have an assistant in curing patients of pernicious anemia. Ultra-violet rays which have been used both with and without the liver have caused a marked improvement in the condition of these patients, according to Dr. David I. Macht, of Baltimore. An increase in hemoglobin and number of red blood cells resulted from the use of these rays. The toxic effect of the blood serum, which is believed to be a causative factor in this disease, decreased.

WHEN the rogues' gallery of plants causing hay fever has been checked over, the paper mulberry tree which flourishes in back yards and vacant lots has always been pronounced innocent. But now, Dr. Harry S. Bernton, specialist in this disease, has reported the first cases in which hay fever was traced to the baleful pollen of the paper mulberry. Three cases have been found by Dr. Bernton in the past two years.

MEASLES, whooping cough, digestive ailments and other diseases attack more boys than girls under 10 years, according to a survey made by the U. S. Public Health Service. However, after the boy is 10 years old, unless he breaks a collar bone or suffers other injury in the course of his more venturesome activities, he will spend less time in bed sick than his sisters of the same age. This bears out the previous morbidity and mortality experience of health officers which gives male infants a handicap over girl babies, but reverses the condition during adolescence and maturity.