

SCIENCE NEWS

THE GOTHENBERG EXPOSITION

Science Service

MANY of the mightiest strides of science through the ages are vividly illustrated in the Tercentennial Jubilee Exposition in Gothenburg which is now open and will continue through the summer. Recent inventions are sharply contrasted with objects serving similar purposes in times even as long ago as the stone age, and in some departments it is possible for the visitor to trace out a complete chain of development in scientific achievement.

Archeology has proved that the region where Gothenburg now stands has inhabited at least 5,000 years ago by the ancestors of the present Swedes. One of the most interesting exhibits at the exposition is a well-preserved skeleton of a man who lived in the Stone Age, 5,000 years ago, and who had evidently met his death on what was then the western sea shore of Sweden. With his skeleton was found a two-edged axe. This crude weapon, which was also a tool, contrasts strangely with the exhibits of modern cutlery, surgical instruments, and delicate tools which have become possible through the unusual refinement of Swedish steel.

From the Stone Age also comes an actual boat which was discovered near Gothenburg. Though made of wood, this boat has, curiously enough, been fairly well preserved through fifty centuries. One can see that it was constructed by burning out the inside of a log, which was afterwards trimmed with a flint axe. This rare relic, certainly one of the oldest marine objects in the world, is item No. 1 in the Navigation Exhibition of the fair, which, according to experts, is the most complete of its kind ever prepared. Four hundred ship models alone are on display, and every phase of navigation is illustrated, whether the propelling power is furnished by oars, sail, steam or oil. Not far away is an actual Swedish marine motor of the Diesel type said to be the largest in the world. This is a four cycle, six cylinder motor, developing 2,000 horse power. It is designed for a new Swedish motor-ship of 10,000 tons.

Up-to-date navigation under steam is represented by the well-known Swedish invention, the de Laval geared turbine engine, and by the Stal turbine engine. Another Swedish invention that has been attracting much attention at the fair is the "vapor accumulator," which is used in many steam power plants in Europe and America. The company which manufactures "accumulators" is now planning to install them on steamships which make short regular trips. Thus a ship may be run by steam, and yet have no firing done on board!

One of the most striking examples of mechanical achievement through a long succession of inventions is illustrated in the Gothenburg exhibition of lighthouses and buoys. In the days of the Vikings night beacons consisted principally of wood fires built on hilltops or conspicuous rocks at times when ships were expected to return. Then came the coal fire beacon, of which the earliest known in Sweden was built in 1202. The coal

was burned in an iron basket hoisted high by means of a long lever. But Sweden had no continuously tended lighthouse until 1635. Then came a long period of steady improvement which in 1904 culminated with the first use of the automatic gas light buoy, invented by the blind Swedish inventor, Gustaf Dalen, called "the Edison of Sweden." These buoys, which guide ships into New York Harbor, and into many other important harbors of the world, can operate absolutely without attention as much as a year at a time, and have an uncanny way of lighting up automatically whenever the sky gets dark, whether the darkness is due to a storm, an eclipse, or night fall. The secret lies in the Dalen valve which is extremely sensitive to light. Another invention of Dr. Dalen, turned out by him after he had lost his eyesight during experiments, is the "aga" light, an electric lamp which imitates daylight.

One of the most prized exhibits at the Exposition is an actual "hot air engine," which was invented and built by John Ericsson, whose fame does not rest solely on the "U. S. S. Monitor" and the screw propeller. This is one of the features in the "Swedes in Other Lands Exhibition."

ECLIPSE EXPEDITION OF THE M'CORMICK OBSERVATORY

Science Service

PLANS have been completed whereby the U. S. S. *Capella* will carry the scientific equipment and two of the scientists of the McCormick Observatory expedition to observe the total eclipse of the sun on September 10 next. The naval vessel will leave Hampton Roads on June 28 and will have as passengers Professor L. G. Hoxton, head of the department of physics of the university, and Allan C. G. Mitchell. The *Capella* will proceed through the Panama Canal and the cruise to San Diego will take a month.

Dr. S. A. Mitchell, director of the Leander McCormick Observatory, who is in charge of the expedition, and Mrs. Mitchell, will leave the university about July 15, and traveling by rail will reach California before the naval vessel.

Permission has been received from the chief of Coast Artillery for the McCormick eclipse expedition to locate on the military reservation at Fort Rosecrans, the coast artillery station on Point Loma. The commanding officer has offered to the University of Virginia observers every assistance possible.

The location on Point Loma will be one of two occupied by the McCormick Observatory party, the other being in the neighborhood of San Diego near the edge of the shadow cast by the moon. At both stations the equipment will be practically identical and will consist of a powerful grating spectroscope with which to investigate the constitution of the heated gases in the atmosphere of the sun and to determine the heights in miles that these vapors extend above the sun's surface.

ETNA'S ERUPTION

Science Service

THE recent eruption of Etna was not of the type which sometimes causes marked variation in weather over fairly long periods, Professor W. J. Humphreys, of the U. S. Weather Bureau, stated in reply to an inquiry by Science Service. Although the volcano emitted a great quantity of ashes, some of which have recently been reported to have fallen in the Alps many hundreds of miles away, Professor Humphreys did not think enough, if any of them, had reached into the upper atmosphere to cause weather changes over a period of months.

Volcanic eruptions have sometimes done this. After the famous eruption of Krakatoa in the East Indies in 1883, the winter was unusually cold, and the cold was general throughout the world. Similarly the "year without a summer," as 1816 is known, was preceded by the great eruption of Tomboro in the East Indies. Other eruptions have had similar effects, owing to the shading of the earth from the sun's rays by the fine haze of ashes, floating in the upper atmosphere and carried all over the world.

But Etna is not primarily an explosive volcano. It generally just boils over as it did this time. The explosions are not severe as volcanic explosions go. Krakatoa's 1883 explosion was heard 2,000 miles away. Etna's eruptions are not strong enough to throw any great volume of ashes nine or ten miles above the surface, which would be necessary to get them above the highest clouds from where they might be dragged down into the general circulation of the atmosphere.

THE SUN'S HEAT

Science Service

THE radiation received from the sun was reported to have declined four per cent. below normal by Dr. C. G. Abbot, of the Smithsonian Institution, at the meeting of the National Academy of Sciences in April, with detailed returns then in only until last September.

Dr. Abbot, who at that time called attention to unusual weather conditions occurring simultaneously with this temporary loss of heat on the part of the sun without offering any theory as to the connection between them, declines to be further quoted on the matter, except to say that the observed records of the sun's performance show a deficiency of heat of about two per cent. up until about eight weeks ago. Records are not yet available beyond that time.

At the time of his announcement to the National Academy, Dr. Abbot said that as a result of the sun's variation "we are not to look for anything so simple as a general drop in temperatures all over the world. Oceans, deserts, mountains, clouds and winds make up too complex a system for such simple reactions. Profound departures of some sort from normal conditions, however, we might expect." As a result of his astrophysical studies, Dr. Abbot has also concluded that the temperature of the earth is profoundly dependent on the humidity of the air and to a less degree on the quantities of ozone and carbon dioxide which the air contains.

The hot spell from which the eastern half of the United States has been suffering is due to stagnation and "scorching" of the atmosphere similar to that of a pudding that is not stirred often enough, according to Professor W. J. Humphreys, of the U. S. Weather Bureau. The progress of areas of warm and showery, and of clear and cool weather across the country has been held up, probably by a strong area of high atmospheric pressure far out in the Atlantic ocean, he said. This has resulted in stagnant conditions, and as the sun is now pouring the maximum amount of heat available upon the northern hemisphere the air gets daily hotter and hotter.

The ice patrol off the Grand Banks of Newfoundland reported June 20 that the cold Labrador current was of small volume and weak, but neither Professor Humphreys nor Major E. H. Bowie, chief of the forecasting division of the Weather Bureau, thought that had much to do with the present hot spell. Neither did Major Bowie think there was any ascertainable relation between the wide-spread warm weather in eastern North America and the unusually cold weather in the far west and in Europe.

The facts all agreed upon seem to be that the sun has for about a year been radiating less heat than normal, and that freaky weather has been observed in widely separated parts of the world; but to this the Weather Bureau officials add the qualifying statement derived from years of experience of meteorological fickleness, "the normal state of the weather is abnormal."

ITEMS

Science Service

CONSTRUCTION of the dam across the Susquehanna River near Conowingo, Maryland, is speeding up an archeological investigation of a prehistoric Indian workshop on an island eight miles above that place. John L. Baer, of the U. S. National Museum, who for years has been seeking the solution to the mystery of curiously wrought stones found in such abundance there and elsewhere, has redoubled his efforts because the completion of the engineering project will drown the island. "Banner stones," as the specimens are called, are believed to have been ceremonial objects carried by the Indians. So far they are unknown west of the Mississippi, but in New Jersey they have been found under other Indian material which indicates that they are very old. From the shape of many of these stones, it has been suggested that they probably were intended to represent birds, butterflies, and other forms of flying life which play a prominent part in many Indian mythologies.

EVIDENCES of a vitamin which occurs in green leaves, cereals and fresh meat, and which is necessary for reproductive power in animals was presented by Dr. Katherine Scott Bishop of the University of California. Rats fed a diet which was perfectly balanced and included all other known vitamins were sterile until fed green leaves, cereals or fresh meat. Dr. E. V. McCollum, of the Johns Hopkins University, told of experiments which indicated the existence of a vitamin that affects the growth of bones.