SCIENCE NEWS

THE TEMPERATURE OF THE OCEAN

Science Service

THE International Ice Patrol, operating from Halifax, reports that the temperature of the sea covering the 35,000 square miles of the Grand Banks of Newfoundland is 7 degrees higher than normal for the time of year. Similar conditions are found in neighboring waters, icebergs and ice-floes are almost non-existent south of Newfoundland, and wide-spread though temporary changes in the climate of eastern America and western Europe are thought likely to occur in the near future by Lieutenant Edward H. Smith, of the U. S. Coast Guard Service, who reports these phenomenal conditions.

His report is based upon the reports of the Coast Guard cutters maintaining the ice patrol. In it he says:

"The early reports from the patrol this spring are of more than passing interest due to the relatively high temperatures which are being encountered over practically the entire continental shelf south of Newfoundland. The Grand Bank, a submerged promontory of 35,000 square miles, is normally covered by a reservoir of water that is free from outside intrusions, such as ocean currents, from September to March every year. This reservoir has a mean depth of 35 fathoms, or 210 feet. It is cooled by the end of winter to a uniform temperature from surface to bottom. This water mass in March constitutes one of Nature's largest and most accurate thermometers, which registers the severity or mildness of the preceding winter season. Normally this thermometer is chilled by the cold blasts from Canada to a temperature of 30–32 degrees Fahrenheit, but this year the spring temperatures are 37–38 degrees; 7 degrees above normal. When we stop to consider that it takes approximately 3,300 times as much heat to raise a given volume of water one degree as it does a similar quantity of air, we can realize the tremendous amount of heat reserve the Grand Banks possesses this year. This also records the passage of one of the warmest winters this region has experienced in the past ten years.

"The patrol vessel has visited several fishing hamlets along the south coast of Newfoundland and all these places state that the winter of 1923–1924 was one of the mildest within the record of their oldest inhabitants. There has been very little Arctic field ice drifting south of Newfoundland this spring. The Grand Banks and offlying banks to the westward are normally covered by fields during March and April, while this year there were no fields south of Newfoundland during this period. Furthermore, during the months of April, May and June there is an average of 350 bergs totalled south of Newfoundland. This spring there have been only seven bergs and at the present writing, May 4, there is not one. We have no year like it on record."

Commenting on these observations, Lieutenant Smith says that such vast bodies of relatively warm water may be traced across the Atlantic for months and have been known to have immense effect upon the general distribution of atmospheric pressure and so upon weather conditions on both sides of the Atlantic.

"That great heat regulator, the North Atlantic," he concludes, "is passing this spring through an unusual thermal process, undoubtedly of a temporary nature. Its direct effect will most certainly be reflected in multitudinous ways and in far distant lands."

THE PLANET VENUS

Science Service

THE planet Venus, which has been such a magnificent object in the western sky during the past winter and spring, far surpassing in splendor the other planets and brightest stars, will reach her greatest brilliancy on May 24. A few weeks later she will be so close to the sun that it will be impossible to find her in the twilight haze after sunset and on July 1 she will be in inferior conjunction with the sun and pass between earth and sun. After that she will be in the morning sky and late in July the early riser will find her ready to greet him before sunrise. At the end of the first week in August, Venus will again be at her greatest brilliancy and after that will draw farther away from the sun and gradually decrease in brightness as she recedes from the earth.

About a month ago, in the latter part of April, Venus was at her greatest distance from the sun in the western sky, at greatest eastern elongation, as it is called. She was then setting more than three hours after sunset and viewed in the telescope she looked like a little half-moon. After that date she began to draw in gradually toward the sun on the side of her orbit nearest the earth and began to resemble the crescent moon in the telescope. When Venus reaches her greatest brilliancy on the twenty-fourth of this month she will look like the crescent moon at the age of five days. This crescent will gradually grow thinner until at inferior conjunction on the first of July it will disappear and the planet will be invisible even in the telescope.

It may seem strange that Venus should be at her greatest brilliancy when she shows the crescent phase instead of at eastern elongation when half her surface is illuminated and she resembles the half-moon or earlier when she looks like the gibbous moon in the telescope. It must be remembered though that Venus is much nearer to us and so appears larger when the illuminated portion is crescent-shaped. As a result this crescent is greater in area than the half moon or gibbous moon of eastern elongation and earlier which we see when the planet is farther from the earth. As the brightness of Venus is proportional to the area of the illuminated part of its surface its brightness will be greatest when the planet is in the crescent phase. But this crescent increases in size while it narrows in width as Venus draws in toward the sun and it is a nice problem in mathematics to determine just when the area of the crescent is at maximum and when as a result the brilliancy of the planet is greatest. It has been found that this always happens 36 days before and after inferior conjunction.

As Venus will be in line with earth and sun at inferior conjunction on July 1 Venus will be most brilliant on May 24 when she is visible in the west after sunset and on August 6 when she will be found in the east before sunrise. At and near the time of greatest brilliancy Venus may be easily seen in broad daylight and also like the moon she casts a strong shadow.—*Isabel M. Lewis.*

THE FOOD SUPPLY

Science Service

"THE question of food will be the dominant one to be met by the ingenuity of man in future ages," J. B. Kincer, of the U. S. Weather Bureau, predicted in an address before the American Meteorological Society. Warning his co-workers that America is the world's last food frontier and pointing out the dependence of food upon favorable climate, he discouraged beliefs that the geographic distribution of rainfall can be changed through the influence of cultivation or otherwise than by nature's own slow processes. Mr. Kincer said in part:

"Man must sustain himself from a very small portion of the earth's surface. Three fourths of it is water and of the remaining land a very large percentage is unsuited for profitable agriculture. In the western half of the United States, southern Russia, western China, and over vast areas within the tropics, limitations to intensive production are imposed by scanty moisture, while in the northern portions of the Northern Hemisphere, and in the higher elevations of middle latitudes, the limiting factors are low temperatures and the short growing season. More than one half of the land area of the globe receives less than 20 inches of precipitation annually, and only about one fourth receives those amounts which are best suited for agricultural purposes, namely, between 20 and 50 inches. Of this fourth, moreover, large areas are unsuited for cultivation, because of roughness, such as mountain sections, or because of low temperatures in more northern localities and high elevations, which leaves a very small percentage available for food production.

"Outside the temperate and tropical zones, the temperature conditions are generally unfavorable for plant growth, and of the 52,000,000 square miles of land within these zones, only about 20 per cent. is potentially arable, a little more than half of which is, at the present time, cultivated or used for pasture. The world's food supply from cultivated crops is now produced on approximately 7 per cent. of the land.

"In recent centuries, the population of the world has increased rapidly. The question of sustenance for the multiplied millions has been taken care of by migration to less densely populated countries, principally the Americas, and by importation from foreign lands of plenty. By this process the unoccupied arable land of the world has been gradually occupied until to-day very little remains in regions with healthful climates. North America now leads the world in production of many food crops, yet but yesterday, as world history goes, it supplied food for only a handful of the Red Men of the forest. To-day the United States, with only about 5 per cent. of the world's population, produces about one seventh of its cattle, one fifth of its wheat, one fourth of its oats, one third of its hogs and three fourths of its corn.

"It is true that our production, by the utilization of all available resources, such as irrigation in the West, and intensive culture in the East, comparable to that practised in the older and more densely populated countries, could be greatly increased. It has been estimated that we could feed between three and four hundred millions of people, but with the millions knocking at our door for admission, and our own natural increase in population, it is easy to vision the time, especially if we have unrestricted immigration, when this country itself would have to look elsewhere for food. The Americas are the world's last food frontier. When they shall have reached their maximum production, if populations continue to increase as in the recent past, a serious situation will be presented."

PAPER MADE FROM WOOD SHAVINGS

Science Service

DR. ALFRED TINGLE, former research chemist for one of the leading pulp and paper mills of Canada, has brought to perfection in University of Oregon laboratories a new process for producing paper pulp from wood in which shavings and similar "cull" material of the ordinary paper pulp mill may be included to give a satisfactory pulp for making a heavy grade of dark paper. All danger of overcooking smaller pieces of wood waste while larger pieces remain uncooked is avoided in Dr. Tingle's method.

Another important feature of the new process, according to Dr. Tingle, is that it can be carried on with a much simpler and less expensive plant than is needed for any other form of pulp.

The application of Dr. Tingle's digestion method, which he believes may prove applicable to northwestern fir wood and at the same time prove cheap enough in operation to use in connection with waste products, is expected to be of great importance to the lumber industry. When the new process is applied to high-grade spruce chips the product may be considered, for many purposes, a competitor with draft pulp.

Dr. Tingle's process involves a double treatment of the wood. The chips or shavings are first digested under pressure with a solution made from lime and sulphur. The product is then crushed to a fine, soft pulp in a suitable acid liquor. The "spent acid" from the manufacture of ordinary sulphite pulp may be used for this purpose. The washed pulp can then be made into a very good grade of paper which, research chemists believe, will compare well with that made from kraft.

BRICKS FROM PRESSED DIRT

Science Service Correspondence

A COMPRESSED brick made from ordinary dirt and suitable for house construction has been developed by two French engineers working under the auspices of the National Committee for Scientific Research and Invention.

In the process perfected by MM. Waligorsky and Carriere, ordinary subsoil earth containing five to eight per cent. of clay is compressed by tremendous pressure. The resultant bricks have a pressure resistance of 600 pounds per square inch.

Walls are coated with a protective mixture which makes them impervious to moisture. The committee states that the new bricks are only recommended for low buildings. Their chief value will be on the farm where outbuildings and walls can now be built with materials found on the premises.

The committee is trying to duplicate the results obtained by a German engineer named Hecht who uses a mixture of other ingredients. To greasy, slippery earth is added either foundry waste, coke ashes, or other cheap porus substances. Pine needles are kneaded into the mixture which is placed in moulds, compressed by hand and allowed to dry in the open air. The bricks formed are considerably larger than the ordinary variety, thus reducing the labor of brick-laying.

Two workers and an assistant working at Gross-Lichterfeld are able to make 200 to 225 bricks in an eight-hour day, equivalent to 1,300 bricks of the ordinary size.

Once they are dry these blocks are sufficiently hard to be laid the same as other bricks. A special mortar has been prepared. Laboratory tests show a resistance of 64 pounds per square inch for blocks four weeks old. Age makes them more resistant. Outside walls are made 9 to 12 inches thick, inside separating walls only 5 inches. Only one-story buildings are constructed but they are dry, warm in winter and cool in summer.

THE CHICAGO MEETING OF PHYSICIANS

Science Service

TEN thousand physicians are expected to attend the coming annual meeting of the American Medical Association which will assemble on the Municipal Pier, Chicago, from June 9 to 13. They will come from all parts of the United States and Canada and from nearly every foreign country.

The practical side of medicine in its relation to the great health problems of the day will be emphasized at this meeting although many of the 300 papers which will be presented before the 16 sections will deal with advanced theoretical problems. But such subjects as the treatment of diabetes with insulin, the treatment of heart disease, the hygiene of swimming, the treatment of gas poisoning, electric shock and lead poisoning will be among the leading topics of discussion.

In surgery, especial emphasis will be laid on progress in surgery of the nervous system and of the gall bladder, although practically every field of operation on the human body will be discussed. One paper will tell of the removal from the lungs of such substances as nails, tacks and buttons in 117 cases. The use of the new anesthetic, ethylene, and other modern anesthetics will be discussed by two sections. The problem of cancer will be treated in all its phases, from the earliest diagnosis to the treatment of advanced cases by high voltage X-rays.

The second floor of the municipal pier is being made over to accommodate the doctors and the exhibits. The exhibits will cover all the fields of medicine and surgery and will illustrate nearly every sort of diseased condition commonly met. State and national health associations will have statistical and public health displays. The United States government will be represented in three exhibits, given by the Departments of Agriculture and the Interior, and by the Public Health Service. A special motion-picture theater, in which the latest progress in medical science will be depicted, will run continuously for five days.

ITEMS

Science Service

THE first tube transmitter to be used in this country for fog-signal purposes has been put in service on the Ambrose Channel Light Vessel at the entrance of New York harbor. This transmitter was installed after a series of satisfactory tests, indicating freedom from directional distortion, lessened interference and increased efficiency. Tests for night effect showed practically no distortion due to this cause affecting the use of the signals for navigational purposes. Radio fog beacons transmit a signal which when received by a radio compass receiving set allows the operator aboard ship to locate the direction of the transmitting station. The radio compass consists essentially of a loop antenna which receives signals more effectively in one direction than in another.

THE fabled performance of the old woman of the nursery rhyme who was able to "sweep the cobwebs out of the sky" has a scientific parallel in the ability of aviators under some conditions to brush small clouds out of the sky by repeatedly flying through them. A fair sized summer cumulus of fair weather cloud may sometimes be obliterated by about 20 flights through it. While there is no adequate explanation for this effect, it is thought to be due to a combination of the stirring effect of the plane and especially of the propeller, the carrying into the cloud of warmer, unsaturated air, and the warming of the air in the cloud by the compression effect of the swiftly moving plane. The method works only when the clouds are about stationary in size, and fails when conditions are such that they are growing rapidly.

THAT fish, contrary to popular superstition, are not frightened or killed by heavy gunfire, is reported by an observer for the California Fish and Game Commission who was on the U. S. battleship *Idaho* during fleet battle practice off the California coast. The heaviest guns of the fleet were fired at intervals for hours and over a large area of the ocean, yet during the thick of the firing no fish were seen to jump from the water as frightened fish do, nor was a single dead fish found afterwards. It is explained that the vibrations of the air produced by sound above water are not transmitted to the water to any appreciable extent. Severe shocks under water, such as those due to mine explosions, kill fish, but they are apparently little affected by detonations above the surface.