SCIENCE NEWS

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MAGNESIUM

THERE will never be a shortage of magnesium. An inexhaustible supply of this metal is on hand. Its "ore" is ocean water. New manufacturing plants are now extracting from the sea far more of this strategic material than is obtained from all other sources in the United States. Thirty million pounds is the expected total production this year, and 90 million pounds next year, as against only seven million pounds in 1939 by the old methods. Introduction of the new method increased the figures at once to twelve million pounds (nearly double) in 1940.

Dr. R. H. Harrington, metallurgist in the General Electric Research Laboratory, in an address to the G-E Science Forum stated that "Even though the concentration of magnesium in sea water is quite low, there are about four and a half million tons of magnesium in a cubic mile of sea water. Thus only one cubic mile of sea water will furnish 90 million pounds of magnesium metal each year for 100 years!"

Three years ago Germany was the main producer of magnesium and was using it plentifully as an "Ersatz" or substitute. Now we are doing the same.

Magnesium is only two thirds as heavy as aluminum. Its principal use is as a component of aluminum alloys. Magnesium alloys themselves are in a number of ways inferior to aluminum alloys, but nevertheless can be substituted for them in a multitude of small parts, housings, cases, plates, gadgets, etc., where severe conditions are not encountered. This is true both for defense and for non-defense industries. They are superior, on account of their lighter weight, for rapidly moving parts.

PIERCING FOG

THAT yellow light is no better at piercing fog than the light of an ordinary tungsten lamp is shown by experiments recently carried out by Dr. Matthew Luckiesh, research physicist and Franklin medalist, and L. L. Holladay, of the Lighting Research Laboratory of the General Electric Company, Nela Park, Cleveland, and reported in the *Journal of the Optical Society of America.*

The so-called fog-lamps, consisting of yellow lenses which absorb from 20 per cent. to 35 per cent. of the tungsten-filament light must contribute something to the seeing to offset the loss due to less light. No satisfactory tests have been published, but the present investigation makes it more than unlikely that they have any advantage. Similar fog-piercing claims have been made for the new sodium lamps. In this case there is no loss of light by colored filters, for the light is inherently yellow and practically monochromatic. Yet even this lamp showed no significant superiority over the tungsten lamp in fog-penetrating qualities.

The two lamps of equal intensity were tested side by side in clear weather, moderate fog, dense fog, mist and snow. They were tested by day and by night. Also a pair of lamps of low intensity and a pair of high intensity were used. Many experienced observers made many readings on a Luckiesh-Moss visibility meter at a distance of 1,000 feet. No significant differences showed in the averages.

The report explains that the fog-penetrating power of a light does indeed depend on its color or wave-length, as has been generally known. Thus blue light, which is of short wave-length, penetrates fog less than red light, which is of long wave-length. The sodium lamp emits yellow light that is practically of a single wave-length. This wave-length is about midway between those of the red and blue lights. Hence the fog-penetrating power of the sodium light is just about middling.

The white light of the tungsten filament contains all the colors from red to blue. It is true that the blue rays are cut down by the fog, but the remaining red rays have a fog-penetrating power superior to the yellow light of the sodium lamps. This evens the score.

SURVEY OF FOOD RESOURCES

THREE FOURTHS of the world's 2,000,000,000 people depend so heavily on potatoes and cereal crops for food that their bodies are likely to suffer damage from the ill-balanced diet.

So it appears from an impressive survey of what the world is accustomed to eating in such comparatively good times as the years before 1939. Dr. Merrill K. Bennett, of the Food Research Institute, Stanford University, has reported the survey to the *Geographical Review.* He finds low income levels to blame for a great deal of the world's monotonous diet habits. And he declares that the only hope for improving human nutrition lies in a world-wide and economic peace, as well as a military and political peace, after the present war.

It is pointed out that "The United States, with 130 million people, is conspicuously the largest national group in the world to enjoy a diet composed of cereals and potatoes to as small an extent as thirty to forty per cent." All the other six countries that have national diets of this standard have together only about 85 million people. These are: Switzerland, Sweden and the United Kingdom in Europe; Canada, Australia and New Zealand.

Asia, excepting Japan, lives on eighty to ninety per cent. cereal and potato fare, in terms of calories. So does a great area of Africa, and also European Soviet Russia. The Americas and Australasia probably have no national groups accustomed to this degree of monotony. Japan is in the class of having a diet from seventy to eighty per cent. in the grain and potatoes class.

Southern Europe and most of South and Central America eat sixty to seventy per cent. cereals and potatoes;

the rest of Europe ranges from forty to sixty per cent. A really liberal diet, according to one American nutritionist, would contain only twenty-one per cent. of this food.

To illustrate for Americans the monotony of such diet, Dr. Bennett shows that an American man who lived on eighty per cent. cereals and potatoes, and consumed 3,000 calories of energy value a day, would have just 600 of those calories in foods other than grain and potatoes.

One liberal serving of beef or chops would alone use up the 600. Or instead, he might add these to his day's ration of one pound of white potatoes and one and one quarter pounds of flour or meal: an apple, half an ounce of sugar, an ounce of bacon, half an ounce of vegetable oil, an ounce and a half of dried beans, half a pound of cabbage. These would add up to 600 calories.

Religious taboos and other psychological factors may keep some countries in a groove of eating an ill-balanced diet and suffering the consequences in malnourishment, but Dr. Bennett concludes that the chief reason for this condition in the world is poverty. Nations, like families, he says, presumably eat mainly cereal foods and potatoes because they can not afford variety.

ACCIDENTS IN INDUSTRY

THE cause of the repeated accidents of some workmen has been identified as the attitude of the accident victim himself by Dr. Alexandra Adler, of Boston Hospital and the Harvard Medical School.

That the accident-producing attitude is different in different workers and in different nationalities was shown by a study of a hundred industrial workers in Europe and a hundred applicants for workman's compensation in Massachusetts.

In America, over a fourth of the accident-prone workmen were over-fearful. That fear of accidents can produce them was demonstrated by a test on soldiers quoted by Dr. Adler in her report to the *American Journal of Psychiatry*. Half the soldiers on a cross-country ride were told that a ditch lay ahead of them. The other half were not informed. Three fourths of those who fell into the ditch were from among those who had been warned.

More than 23 per cent. of the American accident-prone workers had a fatalistic attitude that they were sure to be unlucky. Nearly 20 per cent. had a longing to be pampered and were happy while being nursed after an accident. Over 13 per cent. had a revengeful attitude toward parents or educators. In these, Dr. Adler considers that the repeated accidents are a sort of substitute for suicide.

These were the attitudes most frequently to blame for accident repetitions among the American workers. Among the European workmen, a revengeful attitude was responsible in 56 per cent. of the individuals. Alcoholism accounted for 12 per cent. (as compared with only 3.3 per cent. among Americans), the "unlucky" attitude for 10 per cent. and the longing to be pampered for 6 per cent.

Aside from the alcoholics, only eleven individuals could blame disease or mental deficiency for their repeated mishaps.

ITEMS

THE newly discovered Dutoit comet, first sighted from the southern hemisphere observatory of Harvard University at Bloemfontein, South Africa, has now been picked up by an astronomer in this country, Dr. George Van Biesbroeck, of the Yerkes Observatory. His data indicate that the comet is now in or near the constellation of Capricorn, which is almost due south and half-way from horizon to zenith at 9 P.M. Since it is now of the eleventh magnitude, there is no immediate likelihood of its becoming visible to the unaided eye. Sixth magnitude is about the lower limit of naked-eye visibility for astronomical objects. The Dutoit comet has also been reported by a Belgian astronomer, Dr. M. Delporte, of the Observatory at Uccle, near Brussels. Dr. Delporte's dispatch was relayed to Harvard through the international clearing house for astronomical information at Copenhagen, which continues to function despite the war.

A SHORTAGE in surgical and dental instruments threatens the country, according to the *Journal* of the American Medical Association. To avert it, the Office of Production Management has extended to the manufacturers of such goods "highest civilian preference rating" in connection with orders placed for materials for their manufacture. The rating includes also materials needed for the production of spectacle frames. The hospital apparatus and equipment and the surgical implements and supplies covered by the priority program include adhesive plasters, anesthesia apparatus and supplies, biologicals, antitoxins and serums, clinical thermometers, diagnostic instruments, hospital laboratory equipment and supplies, hospital operating room equipment, hypodermic syringes and needles, surgical and dental instruments, medicinal chemicals, rubber hospital sundries, hospital sterilizers, surgical dressings, x-ray equipment and medical and dental supplies.

A NEW generator, that kills bacteria and other microorganisms with very short sound waves, has been built at the University of California at Berkeley. The device, developed by Professor A. P. Krueger, consists of a nickel tube within a magnetic field, activated by electrical impulses. The tube is first elongated, then contracted by the alternate pulls of the magnets. So rapid is this oscillating motion that the nickel tube emits sound waves with a high frequency of 9,300 cycles a second. The tone is deadly to bacteria and viruses. Staphylococci, bacteria that cause boils and carbuncles, were subjected to this penetrating sound. The bacteria were all killed. Bacteriophage, a virus disease of bacteria, was also destroyed, and the cellular secretion from which bacteriophage is formed was made permanently inert. The generator was developed in the intensive study of bacteriophage carried on for the past fourteen years. Dr. E. J. Scribner, research associate, and B. B. Brown, technical assistant, aided Professor Krueger in his new sonic studies.