SCIENCE NEWS

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THE UNITED STATES INCH

THE inch has lost two millionths of its former size. Though the shrinkage in length is not legal, industry of this country at a meeting of its representatives with the American Standards Association in New York decided to use a new ratio between the American inch and the millimeter in order that the precise measuring of both England and the United States be done on the same basis. Their new definition says that the inch is exactly 25.4 millimeters long instead of 25.40005 millimeters. This is a difference of about one eighth of an inch in a mile.

Adoption of the new ratio is the second and last step necessary to put precision measuring of industry of England and the United States on the same basis, H. W. Bearce, co-chief of the Division of Weights and Measures of the U. S. Bureau of Standards, told *Science Service*. The first and most important step was taken by England, he said, when that country's industrial representatives decided to use 68 degrees Fahrenheit as the standard reference temperature for dimensions. Their standard to which corrections for expansion and contraction had been made was 62 degrees, while engineers in the United States used 68 degrees.

"These changes were necessary," Mr. Bearce explained, "because manufacturers of precision gage blocks are attaining an accuracy of one or two millionths of an inch per inch of length, while manufacturers of precision limit gages are regularly working to an accuracy of a few hundred thousandths of an inch. Obviously in work of this character, uncertainty or indefiniteness to the extent of the difference between the United States inch and the British inch (about one part in 363,000) could not be tolerated. The U. S. Bureau of Standards and the National Physical Laboratory at Teddington, England, will certify industrial gages on the new basis."

Mr. Bearce explained that some engineers will probably describe the changes as the setting up of a new industrial millimeter rather than the actual changing of the length of the inch. The millimeter now widely used, a unit of the metric system, is defined by the length of a platinum bar at the International Bureau of Weights and Measures near Paris. The metric system of weights and measures is standard throughout the world in other than English-speaking countries.

A TOXIC EFFECT OF DEXTRIN

A PARTIALLY digested food may be more poisonous than a non-digested one, it appears from recent experiments by Dr. Lillias D. Francis, professor of physiology at Wellesley College.

Working at Yale University, Dr. Francis found that the use of dextrin, an intermediate product in the digestion of starch, in the dietaries of her mice was followed by severe diarrhea, loss of weight and finally death. If, however, the dextrin was replaced by starch, the more complex carbohydrate from which the dextrin may be derived, the mice did not develop any abnormal symptoms and thrived. Not only that but if, after the animal was suffering with all of the typical symptoms of this "dextrin poisoning," starch was substituted for dextrin in the diet of the animal, it was cured. A return to the dextrin-containing diet at any time was always accompanied by a return of the diarrhea.

The degree of the toxicity of the dextrin seemed to be dependent upon the amount of it used; thus, if 38 per cent. dextrin was used as the source of carbohydrate in an otherwise adequate diet the mice suffered for five to eight days and then recovered. If 52 per cent. dextrin was used the animals suffered a great deal more and if 70 per cent. was used they lived only a few days. All control animals on similar diets but with concentrated starch instead of the partially digested dextrin were quite normal. About 76 animals of all ages have been tested so far.

The cause of the death, according to Dr. Francis, is not known. She has found that the caecums of the affected animals are distended by gas to almost 300 per cent. of their normal size and she has suggested that there is a possibility that a changed bacterial flora in the intestine may have been induced by the imposed dietary régime.

"It is also very interesting that young mice are more susceptible to the deleterious and lethal effects of dietary dextrin than are adult animals," says Dr. Francis. "We are investigating the condition and hope to be able to offer an explanation for it in the near future. It is particularly interesting that this seems to be the only evidence of such a toxic effect of dextrin. I have some experiments going on rats which would indicate that they are not harmed as are the mice, which makes another interesting side of the story which I hope to explain."

CRIME AND DISTURBED ENDOCRINE FUNCTION

IN the *American Journal of Psychiatry*, Dr. Louis Berman, of New York City, widely known as the author of a sensational book on "The Glands Regulating Personality," advances the thesis that a good portion of delinquency in the young and of criminality in the adult is due to disturbed function or imbalance in function of the endocrine glands of the body, the pituitary, thyroid, adrenal, thymus and reproductive glands. He supports his views by a comparative study of 250 criminals and 280 normal persons, upon whom examinations were made of basal metabolism, blood-chemistry, radiograms of the skull and the state of function of the endocrine glands. It would seem from these examinations that not only are endocrine disturbances more frequent in the criminal class, but that even the blood-chemistry is different, the criminals showing a higher concentration of uric acid, more non-protein nitrogen, etc.

The author goes into great detail in regard to the endocrine imbalances, listing certain combinations that

are correlated with robbery and burglary, others with grand larceny, still others with petty larceny, with murder, fraud, forgery, rape, arson and assault. Diagnoses are made with seeming ease and accuracy, as illustrated in two cases in one of which the result is expressed as thymus + 4, adrenals − 3, gonads − 2, in the other, thyroid + 4, thymus + 4, parathyroid − 4. He describes also several cases of juvenile delinquents in which the subjects were regenerated and rescued by adequate endocrine therapy. On the basis of his theories Dr. Berman advocates the establishment of great regional endocrine clinics throughout the country for the examination and treatment of delinquent children and, in addition, preventive clinics to which all children should be taken for periodic surveys of the condition of their endocrine functions.

Even a cursory reading of the paper creates a feeling of skepticism and it is not likely that his over-confident speculations will find any more support from sober scientific research than his previous extreme views on the relations of personality to endocrine function.—W. H. HOWELL.

THE POLLINATION OF PINE FLOWERS

HYBRID pines and other trees, to grow better lumber in less time, are the goal of the Institute of Forest Genetics, with headquarters at Placerville, California. Several new tricks of botanical technique have been developed to speed the work, one of the most interesting of which is the use of a hypodermic needle for pollinating the female pine flowers, which develop into the seed-bearing cones.

Under natural conditions, pines and similar trees are wind-pollinated. Their female flowers open and receive pollen shed into the air by the male or staminate flowers, and carried by the wind in yellow clouds.

This is obviously a most unselective process. One can select a good mother for one's crop of seeds, but their fathers are wholly unknown, as chance and capricious as the wind itself.

To insure a knowledge and control of the paternity as well as the maternity of their seeds, the botanists here tie close-woven canvas bags over the twigs bearing unopened female flowers. Celluloid windows in the bags permit them to see when the flowers open. No chance wind-borne pollen can reach these cloistered pine-flower virgins. They are as strictly under control as old-fashioned French girls awaiting their parents' pleasure in a marriage of convenience.

When they are ready to carry out the pollination, the botanists load the chosen pollen into a sterilized hypodermic syringe. The needle is plunged through the fabric of the bag, and the fertilizing yellow dust puffed in on the flowers by means of a small rubber bulb. Then the puncture hole is sealed over with a bit of adhesive tape and the flowers are still left in the bag until they have set their seed and there is no chance of any contaminating foreign pollen getting in.

It has been learned that pine pollen will keep for a year or more, so that pollens can be stored from one season to the next, or brought from as far away as India to use in making hybrids with western American pines.

ITEMS

MERCURY and iodine disinfectants were the most effective for killing fungus growths similar to the one suspected of causing athlete's foot, Dr. Chester W. Emmons, of the College of Physicians and Surgeons, Columbia University, found from studies which he reported to the American Public Health Association. Dr. Emmons reported the action of a number of other disinfectants, among them some copper and sulphur ones, which he found ineffective in killing the funguses he studied.

FEEDING cows on irradiated yeast or other good source of vitamin D increases the vitamin D content of the cows' milk fifteen to thirty times, Drs. J. G. Hardenbergh and L. T. Wilson, of the Walker-Gordon Laboratory Company, Inc., at Plainsboro, N. J., reported to the American Public Health Association. Milk ordinarily contains only small amounts of vitamin D, but when this is increased by supplementing the cows' ration with a source of vitamin D, the milk acquires the rickets-preventing quality of this vitamin. The amount of vitamin D that must be fed the cows to give their milk rickets-preventing potency has been worked out and found not only not harmful but instead rather beneficial to the animals. The production of such a special milk must be under adequate official supervision to insure reliability.

DR. LOUIS SCHWARTZ, of the U. S. Public Health Service, reported to members of the American Public Health Association that personal cleanliness is an important means of preventing inflammations of the skin acquired by industrial workers in the course of their work. Other important preventive measures are the substitution of harmless substances for irritants and proper ventilation to allay dust and fumes. About half of all compensation claims are for cases of the condition known as dermatitis, which covers skin inflammations and diseases. About 100,000 cases of occupational dermatitis occur throughout the United States in one year. The majority of occupational skin diseases in the United States are caused by acids, alkalies, caustics, oils, greases, solvents and plants.

CREATION of extreme low temperatures to within 1.5 degrees Centigrade of absolute zero where all heat disappears is to be undertaken this winter in a series of experiments that may lead California Institute of Technology physicists to the discovery of fundamental laws governing the internal structure of solid matter. Dr. Alexander Goetz, associate professor of physics, visited Europe this summer where he studied the technique of producing low temperatures. He anticipates that this frigid method attack will allow the study of the crystal structure of metals in their least disturbed state. This is considered essential to discovering fundamental laws, as the crystal structure is more or less disturbed at increasingly higher temperatures.