

Science Siftings

By 'VOLT.'

Nature's Alchemy.

In a recent address, Dr. W. S. Lazarus-Barlow said that the story of radium is one of nature's masterpieces of satire. The alchemists spent lifetimes in trying to change base metals into gold, when 'for untold eons nature has already been turning a relatively common metal, uranium, into radium, 170,000 times as costly as gold. The alchemists' wildest dream was more than fulfilled; but at the same time nature was endowing radium itself with the property of ceaseless change, and, according to some, decreeing that the transmutation should proceed until the radium became converted into lead—worth a few pennies a pound. It is true that it would take an ounce of radium 2000 years to form half an ounce of lead, but this only makes the satire more striking, for we first learned of the existence of radium when of lead there was enough and to spare.'

A Wholesome Food.

With the increasing demand for fresh fruits at all seasons of the year has come the difficulty of supplying them in a condition in which the dangers of contamination are largely averted. Decay is one of the limiting factors in the use of fresh fruits. Among the many fruits there is one (the banana) which is equipped in its native form with a protective covering that calls for more than passing mention. The banana consists, in its green state, largely of starch and water. The essential change during the process of ripening is a conversion of the starch into sugar. The rate of ripening is dependent on the temperature. The edible portion of each fruit is packed away in a peel which serves a more useful purpose than has hitherto been realised. Experiments on the fruit in different stages show that the inner portions of the pulp of sound bananas are practically sterile. The peel is singularly resistant to invasion by bacteria. Even when bananas were immersed in fluids containing disease germs they did not penetrate into the interior. This is an interesting example of a food delivered by nature in practically sterile packages.

Light Without Heat.

M. Dussaud, a French scientist, who has discovered a means for the production of what he terms 'cold light,' made public some details of his discovery, which it is thought may revolutionise electric lighting. Starting on the principle that rest is as essential to matter as to animal organism, he has constructed an electric lamp in which the light is concentrated on a single point by filaments working successively; thence the light is projected through a lens magnifying a thousand-fold. Thus he has succeeded in concentrating a 2000-candlepower light on one point and in passing 32 volts into an eight-volt lamp, which with the ordinary light would burst. Experiments with this lamp have established that the new light is absolutely without danger, as no heat is given off, and it requires 100 times less current than the ordinary lamp. It can be worked by a tiny battery, or sufficient motive power can be obtained from a jet of water from an ordinary faucet.

Invisibility of Icebergs.

The invisibility of icebergs at night, is interestingly discussed in a recent bulletin of the United States Hydrographic Office. Dr. Abbott H. Thayer, the author, contends that on a clear, moonless night and often on a moonlit night, a steamer might run very close upon an iceberg without the slightest sight of it. It is a matter of easy observation that it is the most nearly horizontal top surfaces of a berg, the snowy roof, or other white object that receive the most skylight, and in consequence most closely match it. It follows that with the average silltop shape of an iceberg it will be the highest expanses that are surest to be indistinguishable. These expanses constitute the contour that the watch would espy, were the berg visible, and with these effaced, the berg is optically as if it were not.

The Clinical Thermometer

Little does one think when he is in bed with fever, with a piece of glass sticking out of his mouth and the doctor waiting impatiently for it, to what great trouble the makers of the thermometer have gone to make the instrument accurate (says the *Madras Watchman*). The things necessary in a good clinical thermometer are, first and above all, one that reads accurately; secondly, one that will show the temperature change in the shortest possible time; thirdly, one that will not carry germs; and fourthly, it must be self-registering.

There are more things in the way of accurate reading than one would think. The glass has to be melted and blown, and some glass takes several months to settle back to its normal size; so, if the thermometer has been filled and graduated in the meantime inaccurate readings are the natural result. If the bore is large, and therefore holds a comparatively large quantity of mercury, the mercury will be cooled by outside air before it rises to the point it would otherwise when heated by the mouth. To get a quick reading, the heat has to get to the mercury quickly through the glass, and as glass is a poor conductor of heat it has to be made very thin indeed for quick results. In order that no germs may be carried, the thermometer is made as nearly smooth as possible and the marks are put on the inside of the glass.

The self-registering device is ingenious. It shows the highest temperature to which the thermometer has been subjected and does not 'come back' till put back by the physician. Just above the mercury bulb there is a smaller bulb, nothing more than a widening of the tube; above this is a contraction in the glass, making the tube very small, indeed. When the mercury expands, it is forced up through this contraction by the enormous pressure of heat expansion; but when it cools off and starts to come back; nothing pulling it but its weight, it cannot come. The physician, after looking at it, generally gets it back by holding it in his hand, bulb outward, and describing a semicircle very quickly with his arm. The centrifugal force here developed is greater than the weight of the mercury, and so brings it back.

Perhaps it is not always wise to put too much trust in certain thermometers one comes across in this country of fevers. We have known cases of people giving themselves fever in their anxiety to test their temperature, as we have known other cases of imaginary sickness after assiduous reading of 'family medicine books.' The care exercised by the United States Government, for instance, in the matter of clinical thermometers should arouse great distrust of that much employed register of temperature. The American Government, through its Bureau of Standards, took an interest in the accuracy of clinical thermometers on the market and requested several firms to submit samples for inspection. All did so, and awaited with anxiety the result of the Bureau's tests. It was found that a large number of the ones submitted did not agree with recognised standards and that their accuracy was therefore none too great. So the Bureau undertook to examine and fully test all thermometers got out, at small cost, and to put on them the mark of the Bureau, which guarantees their accuracy at the time of testing and their continued accuracy within small limits for the rest of the time. Their inability to guarantee accuracy after testing is due to the unknown factor of glass contraction, due to cooling from excessive heat in their manufacture.

On the end of every thermometer tested, therefore, are to be found etched in the glass the letters B.S., and following them the serial number of that particular thermometer; so that whenever it is desirable or necessary one can always see whether or not he is using a Government tested instrument.

It takes three seconds for a cable message to cross the Atlantic. Cable costs about £200 a mile to lay, and the total amount existing at the bottom of the sea represents a value of £50,000,000.

Ken. Mayo

THE PEOPLE'S WATCHMAKER AND JEWELLER,

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