MEDICINE

Warns Against Haphazard Use of First Aid Kits

WARNING that unsupervised use of first aid kits in industrial plants may do more harm than good was issued by Dr. M. N. Newquist of Chicago at the meeting of the American College of Surgeons in Chicago. He also declared that industrial organizations should, as far as possible, use hospitals already established in their communities for treatment of injuries to employes, rather than set up their own hospitals within the industrial plant.

"The use of first aid kits in extremely decentralized industrial operations may be necessary," he said, "but their unsupervised use in industrial establishments as a whole should not be permitted.

"Fewer, and more centralized, first aid stations or dispensaries are desirable in order to insure adequate treatment and records.

"Industrialists will find that in the long run they can obtain more efficient hospital service at less cost from organizations whose sole purpose is to conduct hospitals than they could by establishing their own hospitals."

A plea for more and better facilities for training industrial surgeons was made by Dr. Frederic A. Besley of Waukegan, Ill. As president of the American College of Surgeons, he pledged its support to efforts to create greater opportunities and facilities for the teaching of industrial medicine and surgery in medical schools and hospitals.

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ARCHAEOLOGY

Long-Eared Asses Took Early Fighters To War

PICTURE a soldier 5,000 years ago jogging to battle in a one-passenger chariot pulled by four long-eared asses!

We think of ancient warriors tearing into the fray in horse-drawn chariots, with all the wild abandon of a Ben Hur. But here we must imagine them advancing at a donkey's trot, and perhaps stalled by the road, if some balky beast decided not to go to war that day.

Evidence that asses were used this way has been unearthed at Tell Agrab, where the Oriental Institute of the University of Chicago has been excavating. The evidence is a tiny, copper chariot pulled by four asses. It is only three inches high, but so realistic that archaeologists can learn from it new facts about man's very early efforts to travel on wheels.

The chariot takes us back to the time when Sumerians were leaders of civilization in the Tigris-Euphrates valley, before Babylonians and Assyrians trod opposition powers in the dust and forged great empires.

The model shows a Sumerian driver balancing himself in his one-man car by aid of a foot rest and by gripping a kind of center board with his knees. A yoke holds the collars of the inner pair of steeds. The two outer animals are kept in line only by a link with the collars of their neighbors. The reins are attached to rings in the asses' upper lips.

Most remarkable are the two wheels. They are wooden disks with copper studs around the rim, apparently for grip. Here—5,000 years old—is a forerunner of the modern tire.

The little metal donkeys themselves are historic evidence. Archaeologists have been uncertain as to how early Mesopotamia's cities acquired the plodding ass and the faster horse for travel. The tiny chariot proves that asses definitely were used in the early Sumerian dynastic period.

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ENGINEERING

Radio Buyers Defrauded By Dummy Tubes in Sets

EIGHT dummy tubes in a 14-tube radio receiver make it look big, but they do not improve its operation, Dr. Orestes H. Caldwell, former radio commissioner, reports in *Radio Today*.

Purchasing one of these 14-tube receivers, which resembles a popular make of radio, Dr. Caldwell's staff analyzed it, and found its performance to be about one eighth as good as a legitimate 14-tube set, and not quite as good as that of a standard five-tube receiver. Eight of the tubes, each consisting of a filament in a glass bulb, were connected in series across the line, serving no good purpose in the receiver and wasting power. Lamp bulbs would be just as useful in the same locations.

Popular belief that the number of tubes in a radio receiver is a measure of the radio's performance, comments Dr. Caldwell, is responsible for the success of this fraud, which can only be guarded against by purchasing standard types of equipment from reputable dealers.

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IN SCIENC

ENGINEERING

Screen in Electric Light Prevents Blackening of Bulb

AN electric light which, its inventor claims, will not blacken during its lifetime of use, is covered by a patent just granted by the U. S. Patent Office.

A built-in screen to prevent vaporized metal from the filament from reaching the inner glass surface of the bulb features the invention, patented by Richard E. Smith of East Cleveland, Ohio, and assigned by him to the General Electric Co.

Blackening of the bulb surface, which cuts down on the amount of light given out by the bulb, is considerable, particularly in the gas-filled type in general use. The surface becomes blackened through the fact that molecules of the metal filament, heated to incandescence by the electric current, are carried by convection currents in the gas until they are deposited on the relatively cold glass surface.

The screen does not materially interfere with convection currents, Inventor Smith declares in the specifications accompanying the patent, No. 2,100,879, but the vaporized particles are deposited on it instead of on the glass.

Science News Letter, December 11, 1937

MATHEMATICS

20 Years of Calculations On Sun, All Correct

FOR 20 years Dr. E. W. Brown, now Yale professor emeritus of mathematics, has calculated laboriously by long-hand the influence of the sun on the moon, a task that compares in complexity with "a chess problem in three dimensions, played blindfolded."

Joyfully he was able to assure the American Philosophical Society that these two decades of important astronomical calculation were "done without an error."

Dr. Brown, assisted by Dr. W. J. Eckert, by using adapted commercial calculating machines, has checked in one year's time the original calculations and proved them correct.

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E FIELDS

CHEMISTRY

"Byproducts" Becoming Obsolete Word in Chemistry

THE OLD definition of the word by-product, as applied by the chemical industry, is now growing obsolete. Products, once virtually wastes, are finding ever-widening use. All too often, chemists are discovering, the byproduct of a chemical process may outstrip the "parent" product in importance.

Chemical companies making caustic soda by the electrolysis of salt solution obtain chlorine and hydrogen as byproducts. If the demand for caustic soda lessens as it has done occasionally, and the demand for chlorine and hydrogen increases—as it is now doing—then the caustic soda might rightly be considered a byproduct.

Because of this and other examples the chemical industry now defines a byproduct only as something for which a full use has not been developed.

In industry's world true byproducts are few and becoming fewer, notes the Magazine *Fortune* (Dec.), in a comprehensive article tracing the growth of modern chemical industries.

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GEOGRAPHY

China's Great Wall Is Problem in Geography

WHY ancient China built her Great Wall—that twisting dragon of a wall, 1,500 miles across the north—is a problem for geographers.

They see more in China's stony guardian than a military defense. As a wartime barrier the wall was ineffective, though thousands of Chinese were worked to death to build it. One jester summed up the result: The Chinese never got over it; but the Tartars did.

Some Chinese have accounted for their Great Wall as a powerful stone dragon built to keep evil spirits out. But geographers, probing into ancient China's political and social problems, are beginning to look upon the Great Wall as a geographic affair.

In a report to the Geographical Review, Owen Lattimore, geographer, points out that the Chinese were great wall builders long before the day of the Great Wall. In feudal days, when China was still made of separate states, fifth to third centuries B. C., these states built walls against one another as well as against the northern barbarians.

So, when Emperor Huang Ti formed the states into an empire, the idea of rigid boundaries was familiar, and all China was driven to concentrate on marking the empire's northern line.

This was done, it appears, to keep undesirables out and to keep desirables in. The wall marked plainly the northern limit beyond which the empire did not wish to spread. This separating sheep from goats was highly desirable for civilized China. Tribes in Manchuria, Mongolia and Central Asia were uncouth, and their life in forest, desert, or plain was far different from China's intensive farming economy.

But the Great Wall, Mr. Lattimore explains, was never more than a vague boundary. There was pressure and pull in a wide border region. Barbarians would become partly Chinese, and frontier Chinese would drift into anti-Chinese traits. The balance of power in many of China's struggles has rested with betwixts-and-betweens, in zones spreading out from the Great Wall.

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MEDICINE

Cancer in Rats Caused by Feeding Wheat Germ Oil

A CERTAIN kind of cancer or malignant tumor has been produced in some 100 albino rats by feeding them crude wheat germ oil made by ether extraction, Drs. L. G. Rowntree, Arthur Steinberg, William R. Brown, George M. Dorrance and E. F. Ciccone of the Philadelphia Institute for Medical Research reported at the meeting of the American Philosophical Society.

This is the first time that a product of vegetable origin has been found guilty of causing a malignant tumor. The finding, however, does not necessarily mean that wheat germ or any other article of diet is a cause of cancer. But since materials of this class have never before been implicated in cancer causation, a new field of investigation is opened.

"An exhaustive study seems desirable," Dr. Rowntree said, "to determine the relation of certain cereal products to tumors resulting from their use."

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PHYSIOLOGY

Heavy Water Causes Thirst By Exosmosis of Cells

EXPLANATION for the thirst caused by drinking heavy water (water formed with double-weight hydrogen instead of the ordinary single-weight kind) is offered by Prof. S. C. Brooks of the University of California (*Science,* Nov. 26).

In a series of experiments with large cells of the water plant, Nitella, Prof. Brooks showed that heavy water causes a shrinkage of the cells, due to exosmosis, or the pulling of ordinary water out of them. Replaced in ordinary water, the cells swelled up again to original volume.

Since the sensation of thirst is a signal of loss of water from cells in the body, effects similar to those observed with the plant cells apparently take place when an animal or a human being drinks heavy water and becomes unbearably thirsty.

Science News Letter, December 11, 1937

PHYSICS

Mysterious Cosmic Rays Pierce 1600 Feet of Rock

SCIENTISTS studying the still-mysterious and piercing cosmic rays which continually strike the earth and everything on it, from the depths of outer space, are adventurers. They have climbed rugged mountain peaks, carried their instruments high into the stratosphere in balloons, sailed the seven seas and sunk their equipment deep in lakes.

Now, it is disclosed at the meetings of the American Physical Society in Chicago they have donned miners' crash-helmets and carried their delicate measuring apparatus into deep mines.

V. C. Wilson of the University of Chicago reported to the physicists' meeting his experiments carried out in a mine in Michigan to a depth of 1600 feet.

At this great depth the intensity of the cosmic radiation was only one twenty-thousandth of that at the surface of the earth. So deep was the penetration that electrons and photons fail to account for the observations although they predominate in the earth's atmosphere.

It is believed these experiments provide evidence that the new-found "heavy" electron, or else the much-mentioned but yet undiscovered neutrino, is the causative agent of the piercing rays.

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