



VEST-POCKET SUN

New mercury vapor arc lamp, no bigger than a cigarette, is surrounded by rapidly flowing water to keep it cool while it radiates light one-fifth as brilliant as the sun's.

METALLURGY

China's Tungsten Monopoly Broken by Molybdenum

CHINA, once the dominant factor in the world tungsten market, has been losing her dominant position because of the growth of tungsten production elsewhere and through the emergence of a rival material, molybdenum, Kurt Bloch has reported to the American Council of the Institute of Pacific Relations.

Useful not only for the delicate filaments of incandescent electric lamps, but in the manufacture of magnetic and tool steels and armor plate, tungsten until recent years was very nearly a monopoly of the Chinese government. Large deposits of tungsten ore are located in Southern China.

Production of molybdenum, three-quarters of which is produced in the United States, has increased from 35,000 tons in 1930 to 121,000 tons in 1934, Mr. Bloch reports. Molybdenum, cheaper than tungsten, belongs to the same family of elements in the periodic system and therefore has roughly similar properties.

Feverish rearmament efforts, particularly by Germany and Russia, forced the price of tungsten during the 1933-35 period to a high level, thus increasing the competition of molybdenum and world production as well. Establishment of Nanking sovereignty over the Canton government in 1936 and a barter deal with Germany resulted in diversion of most of China's tungsten to Germany and from the European market. Publication of the British White Paper on re-

armament in February, 1937, resulted in a wild tungsten boom.

Outbreak of the Sino-Japanese war led to the belief a tungsten famine was in sight and the price of the metal soared to a level only a little below that of silver. Action by the German government in ordering the use of molybdenum as a substitute for tungsten and in releasing some of its huge stocks to profit from high prices resulted in lowering the price of the metal.

Production from other ores, notably from ores in Bolivia, plus the increasing competition of molybdenum, indicates that there will be no repetition of the sky-high tungsten prices of a year ago,

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GEOLOGY

Research on Minerals Scheduled for TVA

MINERAL resources of the Tennessee Valley, other than metals, are to be investigated in a new experiment station to be established by joint arrangement of the U. S. Bureau of Mines and the Tennessee Valley Authority. The Valley's great wealth of non-metallic minerals, such as clays, mica, and quartz, together with the abundance of low-cost power available, make it a favorable region for such research.

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ENGINEERING

New Midget Arc Lamp Rivals Sun in Brightness

A "MIDGET SUN" in the form of a 1000-watt mercury arc lamp whose brightness is one-fifth that of the sun's surface and is yet no larger than a cigarette is announced by the General Electric Company and the Westinghouse Manufacturing Company.

Consisting of a small quartz tube whose tiny bore contains a globule of mercury, a trace of argon and the necessary electrical contacts, the new lamp's light source is approximately 12 times as brilliant as the incandescent filament of the standard 1000-watt projection lamp, company engineers declare.

It will find wide use in photo-engraving work, in blueprinting, photo-enlarging, in searchlights, and for therapeutic applications, they predict.

The lamp is watercooled because enormously high pressures and heat are developed in producing its brilliant light. Three quarts of water a minute flow past the midget through a special water jacket. A pressure-operated switch and magnetic valve turn the water on before the lamp is lighted and turn off the lamp in the event of failure of the water supply.

The light given off by the arc, about the size of a common pin, is stated to be whiter than that emitted by the conventional mercury lamp.

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PSYCHOLOGY

Mental Stock Market of Intelligence Explained

IF THE stock market baffles the layman with its cryptic bid and asked figures and abbreviated designations of companies, even more does the mental "stock market" of intelligence rating puzzle the uninitiated.

School children and their parents, too, may well wonder what the A's and B's and E's on the report card mean in terms of mental ability. The answer usually is, not too much. More exact is a child's intelligence quotient, commonly known by its symbol I. Q. If you wish to know whether your child's I. Q. indicates genius or just average, here is the key to the mystery.

Intelligence, like freckles, is unevenly distributed. But like most things in nature, intelligence is so spread that most persons have just a normal amount.

The par value of mental stock, as



DOLLARS FROM HEAVEN

Radiometeorographs, which are featherweight robot weather observatories, are carried high into the upper atmosphere by small unmanned balloons. The tiny radio sets they carry automatically send messages back to the scientists who launch them. At the top limit of flight, the balloons burst and the radiometeorographs are carried gently back to earth by parachute. Since the instruments are moderately costly, the companies that make them and lease them to the Weather Bureau offer rewards, which may be as high as \$20, for their return. These boys are examining the treasure trove that dropped into their own front yard.

expressed in I. Q., is the same as it usually is in the language of Wall Street, 100. The range of 10 points on either side of that I. Q. score of 100 is just what the greatest number of normal healthy American boys and girls might be expected to rate.

If your boy rates between 110 and 119, he is bright. If he stands between 120-129, he is very bright. If above 130, you are justified in calling him gifted. If he should tip the mental scales at 180 or more, you may term him a genius. Of such, Dr. Harvey Zorbaugh at New York University, estimates there are only about two dozen in all New York's million school children.

At the other end of the scale, those rating between 80 and 89 are backward, 70 to 79 borderline, and below 70 feeble-minded. The mentally defective are again divided into morons, 45 to 69, imbeciles, 20 to 44, and idiots, 0 to 19.

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● Radio

Every Friday at 7:30 p. m. EDT, 6:30 p. m. EST, 5:30 p. m. CST, 4:30 p. m. MST, or 3:30 p. m. PST, Science Service cooperates with the Columbia Broadcasting System in presenting over the Columbia coast to coast network a new series of "Adventures in Science" presenting dramatizations of important scientific advances and discussions by eminent scientists.

CHEMISTRY

Method Needed For Detecting Oxygen Lack

LACK of any simple, quick means of detecting the absence of oxygen is imperilling the lives of fire fighters, declares Dr. Harrison E. Howe. (*Industrial and Engineering Chemistry*, Sept.)

"Equipped as departments now are with protective masks, they are naturally called upon to make rescues of men overcome by toxic gases. But this often brings them into an atmosphere so deficient in oxygen as to be fatal," says Dr. Howe.

Oxygen-supplying apparatus is available, but it is so bulky and heavy as to be difficult to use in many situations. The protective equipment with which fire fighters are fitted removes toxic gases, but it does not supply oxygen.

"One thinks of the safety lamp used by miners, the possibility of carrying a cage of canaries or the advice sometimes given to farmers to lower a lighted lantern into a silo, but we must do better than that," Dr. Howe continues.

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PSYCHOLOGY

The Child Who Can't Learn May Be Behavior Problem

DEFIANT, restless, truant, and subject to temper outbursts. That is a picture of what school officials know as a "problem child."

It is also a typical picture of a child who has failed in learning to read, write and cipher—particularly to read, Dr. Charles L. Vaughn, of Detroit's Psychopathic Clinic, has learned from a study of boys at the Wayne County Training School.

These boys were from 12 to 15 years old and yet tests showed them to be below grade three in reading. In other words they had spent about nine years in school trying to learn to read, without success.

It is hard to realize the insult that such a prolonged failure is to the sensitive nature of a child. If he cannot learn to add, that is to some extent at least a private matter between his teacher, his parents, and himself. He can hide those arithmetic papers with the damning zeros.

But when it comes to reading, he is asked to stand up before the whole class and demonstrate almost daily his weakness.

If you have struggled with an income-tax blank, a difficult cross-word puzzle, or one of those baffling Oriental cut-up puzzles, you know the exasperation that can result from failure even when no audience jeers at your mistakes.

A child should not be forced to learn to read and to try to master other school subjects until his mind has matured sufficiently to make it possible, is Dr. Vaughn's conclusion.

Teachers should try new methods of instruction with the child who is not learning, or else the child should be given another type of program, such as handwork, that he can master.

No child should be forced to submit to ignominious failure until his whole personality is disorganized, and catastrophe brings him to the psychopathic clinic.

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