Hospital and the office of the Chief Medical Examiner, New York City. In 19 of these the pancreas condition was so severe as to be held responsible for the deaths. A history of long continued heavy indulgence in alcohol was obtained in 11 of these and in at least nine cases the onset of the pancreas disease was preceded by an alcoholic bout. The frequency with which inflammation of the pancreas and alcoholism are associated is indicated from the fact that 27 of the reported cases were found in about 150 consecutively autopsied cases of acute and chronic alcoholism dying in Bellevue Hospital.

The pancreas condition is not significantly associated with cirrhosis of the liver, Dr. Clark said. Cirrhosis of the liver was absent as often as it was present in the cases of the pancreas disease.

Science News Letter, April 6, 1940

Chemical Hardens Arteries

HARDENING of the arteries is due fundamentally and directly to undernourishment of the walls of the arteries, in the opinion of Dr. W. C. Hueper, New York City. Support for his theory appeared in experiments in which he treated rats with the chemical, erythrol tetranitrate. This substance lowers both blood pressure and the amount of oxygen in the blood. As a result, nourishment of the arteries might be impaired. In the experiments Dr. Hueper reported to the Pathologists' meeting, the rats after treatment with this substance developed sclerotic or hardened arteries of the heart, lung, kidneys and certain other organs.

Science News Letter, April 6, 1940

TECHNOLOGY

Novel Use of Paint In Industry's Building

VERMILION ceilings with center medallion done in white, walls caenstone color. This is how national headquarters for the paint, varnish and lacquer industries have decorated the entrance into their new offices in what was once the home of Vice-President Levi P. Morton. Other uses of color chosen for light reflection value as well as beauty: soft light blue on the walls of the stenographic room, walls of old burgandy in a room with a beautiful carved white Carrara marble fire place, laboratories in tints of pale green, yellow and gray, three shades of blue in another office, cafe au lait and muskmelon tint for still another office, and fireplace mantel in the library, vermilion, antiqued with black.

Science News Letter, April 6, 1940

DAMAGE

Half buried in a sand-bag pit a five-pound Barlow bomb produced enough concussion to knock the side off a nearby shed. In the illustration on the front cover of this week's "Science News Letter," the boards can be seen in the air as they leave the shed. The compression wave of this blast was strongly felt by observers behind distant sand-bag barricades. Photos on cover and this and facing pages by Fremont Davis, Science Service staff photographer.

MILITARY SCIENCE

Barlow Demonstrates Safety Of Oxygen-Carbon Bomb

But Experts Point to Long History of Such Explosives In War and Mining To Justify Their Strong Skepticism

See Front Cover

INVENTOR Lester P. Barlow and his colleague, G. B. Holderer, explosives consultant, did everything but jump on his liquid oxygen-carbon explosive bombs to prove their safety from shock, at the proving ground of the Glenn L. Martin airplane plant at Middle River, Md. They burned the bombs, fired rifle bullets into them, shot them out of a trench mortar 500 feet into the air, shot them against a steel plate so that they ricocheted 300 feet—all without explosions.

After each "safety" test they took the battered bomb and exploded it with startling effectiveness by blasting caps.

But unanswered riddles after a five-hour-long demonstration included the Barlow bomb's effectiveness compared with TNT and whether it could be applied to military purposes. In fairness to the inventor it must be said that in his recent demonstration he sought only to prove the safety of his explosive to shock.

Claim of Mr. Bar- (*Turn to page 222*)

THE Senate Military Affairs Committee may have burned the recent, secret testimony of Lester P. Barlow about his liquid oxygen-carbon bomb but it is likely that at least 99% of the facts about the explosive are contained in technical libraries and have been known for years.

There is more than a suspicion that Mr. Barlow's "glmite" explosive is just L.O.X. rechristened. L.O.X. stands for liquid oxygen explosive which is a term coined back in the 1920's by one of the nation's foremost authorities on the explosive properties of liquid oxygen and carbon: Dr. G. S. Rice, former chief mining engineer of the U. S. Bureau of Mines who retired in 1937.

From recent publicity one might think that Barlow's use of liquid oxygen adsorbed by powdered carbon was the newest of the new when, as a matter of fact, liquid oxygen explosives were among the reasons which made the German high command confidently prepared to begin the World War, as it could be substituted for nitrated explosives formerly obtained by importation from Chile.

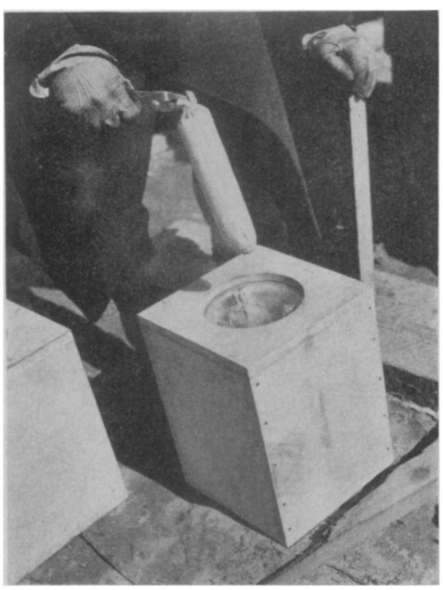
Prime German World War weapon was the discovery of the Haber process to take nitrogen out of the air and make military explosives out of it. L.O.X. came into the picture because it gave Germany a secondary explosive to use in its mines, thus freeing nitrated explosives for military purposes.

Dr. Rice, after the armistice, went to Europe to assist the Peace Commission and report on the military destruction of the north of France and to investigate Germany's use of L.O.X. to destroy French coal mines and industrial plants.

In the evacuated areas Dr. Rice found 136 L.O.X. plants which, during the war, made 5,346,000 pounds of liquid oxygen explosive; the equivalent of 8,000,000 pounds of dynamite containing 40% nitroglycerine. One feature of the German World War practice was the use of little portable liquid oxygen plants producing from 3 to 5 liters per hour.

Unless an impartial test by some government agency proves that Mr. Barlow and his associate, G. B. Holderer, have circumvented the chemical laws governing the release of energy by an explosive it appears improbable that the new Barlow glmite (named after the Glenn L. Martin Co.) is much more than a refinement of L.O.X. which has been used on a wide scale in mining for 20 years.

The scientific literature of L.O.X. is very voluminous. A day spent in the library of the U. S. Bureau of Mines will show hundreds of pages describing experiments which the Bureau itself has carried out to help make L.O.X. the respected explosive it is today in the mining field.



GLMITE

Looking like a frosted sausage is this little half-pound Barlow bomb of liquid oxygen and carbon. The bombs are handled with pliers because of their extreme low temperature.

Thousands of pounds of L.O.X. are used annually in the strip coal mines of Illinois and Indiana where the seams of coal are only 10 to 60 feet beneath the surface of the earth. The seam is exposed by power shovels after explosives have loosened the overlying ground. At these strip coal mines central plants produce liquid oxygen on a large scale and the companies use L.O.X. every day with low cost, good efficiency and with an accident record no worse than that for dynamite and other, more familiar, explosives.

Down in South America at the copper mines of the Chilean Exploration Co., L.O.X. is used successfully in deep mines. The company has turned to L.O.X. because it feared the hazard of handling the vast amounts of explosives it required which formerly were shipped in by the boat load and transported to the mines by whole train loads. As a minor note, too, they experienced theft of dynamite for this explosive served as a makeshift form of money. They saw in L.O.X. a way to obtain an "unnegotiable" explosive and at the same time decrease storage hazards.

Only in open mines, reports of U. S. Bureau of Mines experiments show, is L.O.X. a useful, safe explosive. It has been found that in closed workings it may generate deadly carbon monoxide and is a hazard.

Moreover, there is the possibility in underground coal mines that the liquid oxygen will be spilled on nearby coal dust and generate more L.O.X. These, and other reasons, make the U. S. Bureau of Mines frown on the use of L.O.X. in underground mines. What is done in South America is no concern of the Bureau. The open strip coal mines of the middle west can use L.O.X. without any more risk than in using dynamite.

Here are the advantages and disadvantages of L.O.X. as used commercially, as taken from the authoritative Bulletin 349 of the U. S. Bureau of Mines, published in 1932.

Advantages of L.O.X.

1. No storage hazard because L.O.X. is not suitable for indefinite storage owing to its purely temporary explosive nature.

2. No danger in transport of the separate ingredients; liquid oxygen and carbon.

3. No danger of misfires for if the liquid oxygen is allowed to evaporate, as it quickly does, there is no explosion. This means that there are no unexploded cartridges in the mine.

4. Excellent value in cold climates. L.O.X. has a temperature of 183 degrees below zero Centigrade, so that even Alaska's coldest winters are warm by comparison. In contrast, dynamite sometimes requires thawing by heat for when frozen it is very unstable and liable to accidental explosion by shock.

Disadvantages of L.O.X.

1. Somewhat more sensitive to shock and impact, but no more than certain dynamites.

2. Inflammable nature. Because L.O.X. liberates pure oxygen constantly by evaporation it can turn a nearby glowing coal into a burst of flames.

3. The rapid evaporation of L.O.X. sometimes leads to speedy handling of the explosive; hence carelessness that may lead to disaster.

4. Generation of deadly carbon monoxide in underground operations.

5. Liquid oxygen spilled on coal dust in preparing the L.O.X. cartridges may create more unintentional L.O.X. in the mine.

Science News Letter, April 6, 1940

MEDICINE

Heart Disease Reported From Lack of Vitamin B

DISEASE of the heart muscle and death resulting from a lack of vitamin B and potassium in the diet was reported by Drs. R. M. Thomas, E. Mylon and M. C. Winternitz, Yale University School of Medicine, at the meeting of the American Association of Pathologists and Bacteriologists in Pittsburgh.

Young pigs and rats were the victims in the diet studies reported. Only the heart was damaged by the experimental diet, and the damage depended on the combination of potassium deficiency and vitamin B deficiency. When the animals got an adequate amount of either the potassium or the vitamin, heart damage was prevented. The particular part of the vitamin B complex involved is B_6, the Yale investigators found from experiments with diets lacking in various parts of this vitamin as well as in potassium.

Science News Letter, April 6, 1940

An electric fence will be tried out as a device for keeping *elephants* from getting into rubber plantations, in India.

four of the mammoth carved heads are reported as having broad noses, thick lips, and prominent eyes. How Indians transported such heavy basalt boulders, six to eight feet high, to the swampy plain near La Venta, in the State of Tabasco, is not yet understood. Nearest basalt found by the archaeologists is 100 miles away. The age and the significance of the stone heads are other unsolved mysteries.

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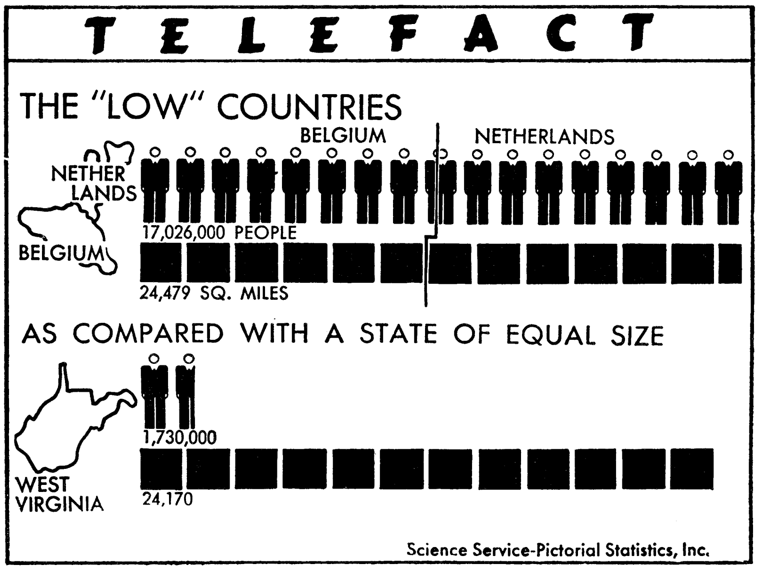
From Page 214

low is that the addition of secret acids to the activated carbon in his bombs has reduced their shock sensitivity which troubled earlier experimenters. Whether this reduction of shock sensitivity has, at the same time, reduced the power of the bomb, observers had no way of knowing, but Army experts can determine that if they wish to do so. It is almost axiomatic, however, that explosives which have the greatest detonation — or compression — waves as they explode are the most sensitive to shock. Pure nitroglycerine, for example, gives a terriffic compression wave but is so sensitive to shock that it is seldom used in a pure state as an explosive.

Inventor Barlow has been claiming amazing compression wave effects from his bombs. Although military experts have not tested his bombs carefully they are inclined to agree with him. But they add that the military usefulness of this shock wave may or may not be great. Such shock waves may be very effective on rigid objects like buildings, but not too potent on the human body which is more resilient.

Mr. Barlow's demand for his "goat test"—staking out goats at intervals in a great field and noting how many would be killed by the compression wave —would provide some test on this point. However, the experts will believe—until shown differently—that you cannot have terriffic compression wave effects and good safety, too. You can have one or the other, but not both.



A forthcoming test at the Aberdeen, Md. proving grounds of the Army, in which Barlow's explosive will be compared with TNT, should test this point.

If Mr. Barlow can get his terriffic shock wave and safety also, his bomb might be able to revolutionize trench warfare. Exploding the bomb some 30 feet in the air would drive a wave down into shell holes and trenches and kill the soldiers there unless they are deep down in dugouts.

The inventor, affiliated with the Glenn L. Martin Company, points out that with TNT airplane bombs half the weight of a 1,000-pound bomb is in its steel housing and that the plane with such a bomb is carrying only 500 pounds of explosive. He claims his bombs do not need this heavy container and that nearly all the 1,000 pounds payload could be in explosive.

Military experts, however, counter this point by saying that this heavy container gives the TNT bomb something with which to kill and claim that the Barlow bomb would need similar housing—that would splinter—to make it an effective lethal weapon. Again one sees the skepticism of the military mind to the lethal properties of the mere compression wave.

Finally comes the temporary character of the liquid oxygen-carbon bomb. Greatest claim of inventor Barlow is that a bomb 10 inches in diameter would have an explosive life of 30 hours. He quickly adds, however, that this is quite sufficient for any bombing flights that might be undertaken. Military experts admit this, but point to the need for an apparatus to liquefy oxygen at the bomber's home base. They strongly feel that such equipment would not be feasible for artillery batteries up near fighting lines whose location is often temporary, and hence see little value in the Barlow explosive for shells.

According to Mr. Barlow's figures, the liquid oxygen bomb would be much cheaper than TNT. He claims production of his explosive for four and a half cents a pound whereas TNT is now selling for about 25 cents a pound. In the last war TNT went up to $1.25 a pound.

An intriguing aspect for humanitarian laymen is that the Barlow bomb—because of its temporary nature—would be more defensive than an offensive weapon for America. This is because liquid oxygen plants might be constructed in our military airport bases, whereas an invading enemy, from across the seas, would be encumbered by portable installations.

However much this might apply to America, it would not apply in Europe where boundaries are close and a long bombing flight takes only 8 to 10 hours.

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