

inventions. It is reasonable to believe that without these inventions we should not have the industries they created.

The word invention means to many people simply a machine that reduces or wholly displaces manpower and by that reduction and displacement raises economic problems and difficulties.

This subject is too big for complete discussion here, but I can give a generalization. We are not yet blessed—or cursed—with machines that make themselves. Those now in service had to be constructed of raw materials which had to be produced and transported and

fashioned to requirements. All of these processes necessitated human effort.

In short, man is prior and indispensable to the machine. You can have man without a machine, but you can never have a machine without man.

The moral which this anniversary impresses on me is that patents have put a premium on genius, and all of us have shared the gains. Every successful invention becomes a new inspiration. While that impetus continues we may count on progressive improvement in our way of life.

Science News Letter, April 6, 1940

ANATOMY

Human Embryo in Third Week Added to World's Collection

Minute Creature Only Sixtieth of Inch in Diameter Is Complex in Structure; Football Affects Blood

A HUMAN embryo in the third week of its prenatal existence has been added to the world's small collection of invaluable specimens showing earliest stages in development of the human body. Microscopic sections of it were shown to the meeting of the American Association of Anatomists in Louisville, Ky., by Prof. John S. Latta of the University of Nebraska.

The almost pinpoint sized embryo (it is only about a sixtieth of an inch in diameter) was embedded in tissue which had to be removed from a patient in a Nebraska hospital. Serial sectioning disclosed its presence, and showed a considerable complexity in structure despite its minute size and brief period of development.

Science News Letter, April 6, 1940

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Football in the Blood

FOOTBALL "gets into the blood" of the players in a much more literal sense than the usual use of the phrase connotes, it was shown by studies of the blood of football men reported by Dr. Edmond J. Farris of the Wistar Institute of Anatomy and Biology, Philadelphia, to the American Association of Anatomists at Louisville, Ky.

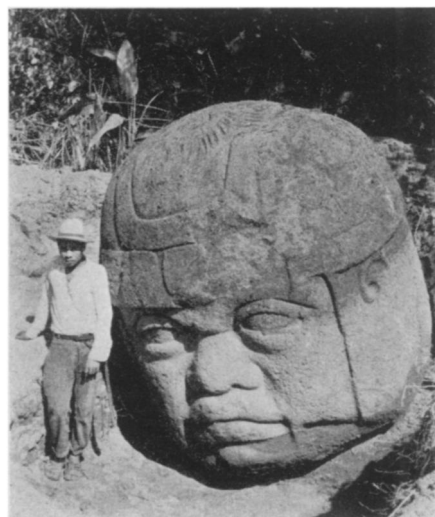
Dr. Farris took samples of blood from a number of football players before and after games throughout a hard playing season and made comparative counts of the red corpuscles and of several types of the white corpuscles. He found definite changes every time a game was played.

Until mid-season, football had a destructive effect on the red corpuscles; there was an average drop of 822,000 cells per cubic millimeter following each game. From mid-season on, however, the picture reversed itself, with an average increase of 618,000 red cells per cubic millimeter until the end of the season.

Both physical exertion and emotional stress showed their effects in changes of white blood cell numbers. Dr. Farris suggested that white corpuscle counts might possibly be used to give a quantitative measurement of fatigue and exhaustion effects.

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Maine's trout fishing season legally opens "when the ice goes out."



INDIAN MYSTERY

ARCHAEOLOGY

Mexico's Great Stone Heads Provide New Indian Mystery

FIVE great stone heads, each weighing more than 20 tons, are the newest ancient American mystery.

Unearthed in Mexico by a joint expedition of the National Geographic Society and the Smithsonian Institution,

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Wellesley, Mass.

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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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 terrific 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 terrific 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 terrific 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.

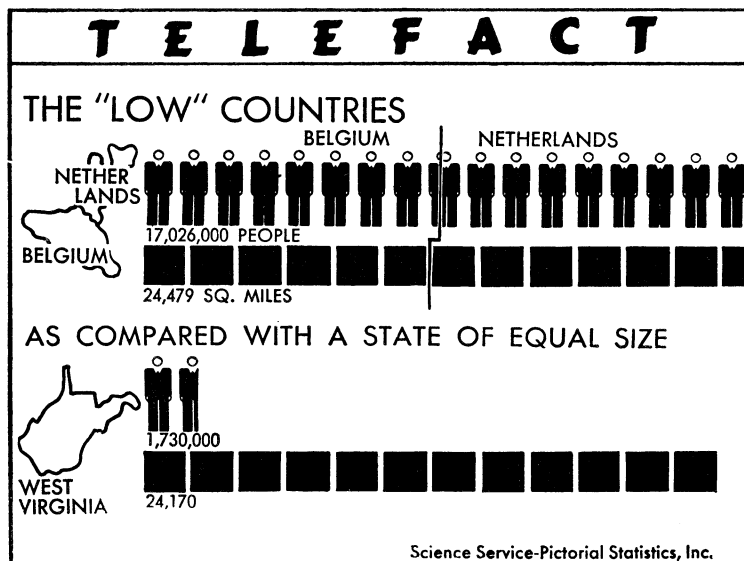
Finally comes the temporary character of the liquid oxygen-carbon bomb. Greatest claim of inventor Barlow is that a bomb 10 inches in diameter would have an explosive life of 30 hours. He quickly adds, however, that this is quite sufficient for any bombing flights that might be undertaken. Military experts 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.

Science News Letter, April 6, 1940



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