

because it requires only a little preponderance of force to destroy faith in one's military superiority. That is precisely what happened to German morale in July of this year. For four years the Germans had successfully withstood the whole civilized world arrayed against them. In spite of inferiority in numbers and resources, they were able to add victory after victory to their astonishing record, and they were able to do this because of their superiority in leadership. In this superiority (and justly so) they believed implicitly. They made a god of Hindenburg, and Ludendorff was his prophet. They were invincible, and this belief in the invincibility of their leadership was the sustaining factor in their morale.

"In July Foch demonstrated to the German masses that superiority of leadership had passed definitely and permanently to Allied arms. The advantage the Germans had enjoyed for four years was snatched from them. The ground was knocked completely from under their feet. They knew now that their cause was hopeless. That was the beginning of the end, and the decline was swift."

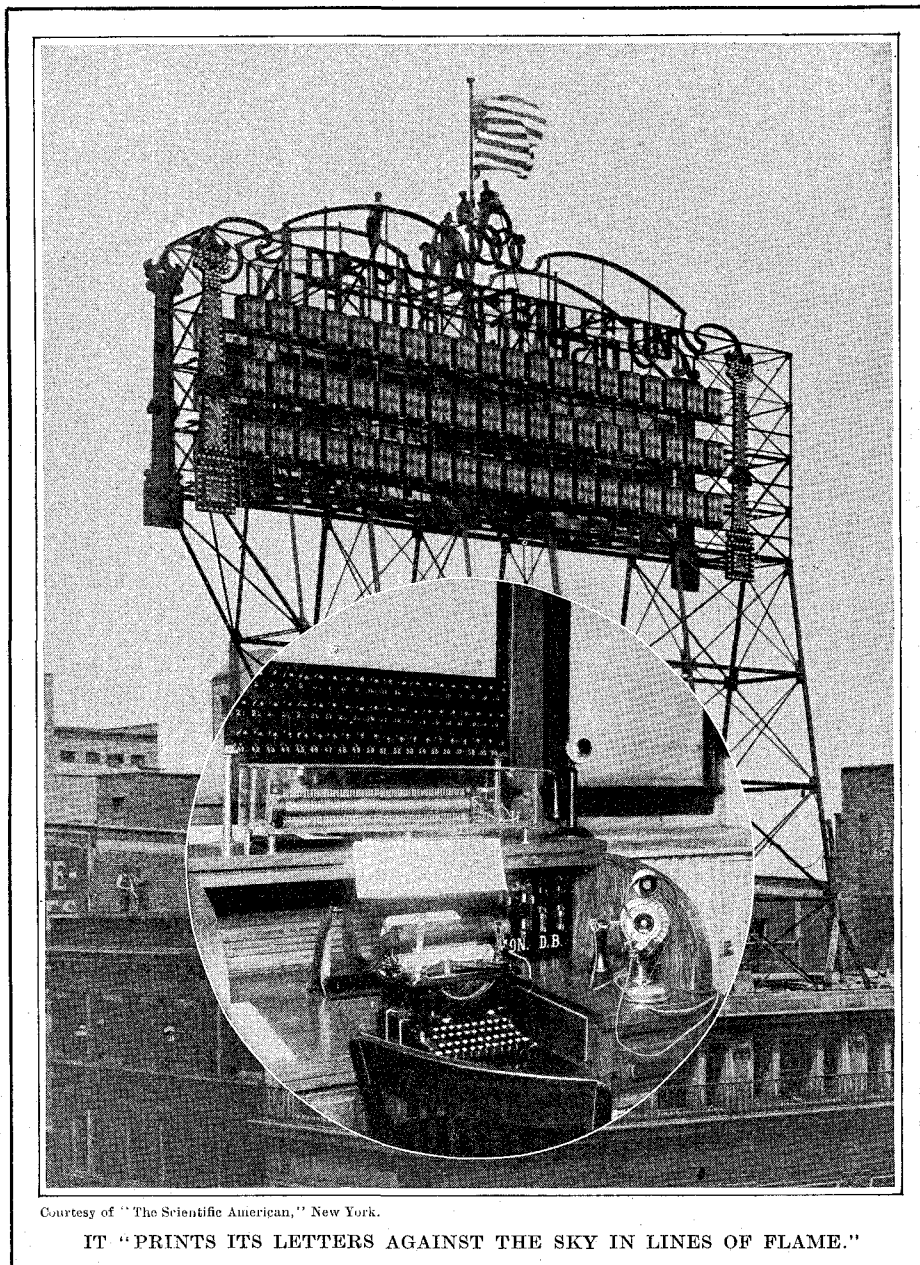
## TYPEWRITING ON THE SKY

A TYPEWRITER has been invented that prints its letters against the sky in lines of flame, as well as writing them on paper in the usual way. The keys are electrically connected with a system of lamps held aloft by a massive framework. Says a descriptive writer in *The Scientific American*:

"News bulletins, flashed in big electric letters almost simultaneously with their receipt over press-wires, are made possible by a new electrical device. This invention consists of a huge bulletin-board, operated by a typewriter. It is called an electrograph. On either side of the board, which towers above a newspaper building in a Mid-Western city, are sixty monograms, arranged in three rows. Each monogram, which measures 2 by 3 feet, contains an arrangement of twenty-one lights, various combinations of which form any letter or numeral, the dash, question-mark, and dollar sign. Selection of the groups of lights to form the various characters is done by pressing the desired keys on the typewriter. Selection of the monograms is done automatically through an extra platen on the typewriter. Thus, when the operator writes a bulletin on the typewriter, the letters appear in quick succession on the board and remain until the bulletin is completed. The bulletin may be left on for any desired length of time and then released by pressing a single key. A unit releasing device enables the operator to strike out a single letter without interfering with the other letters. Thus, when an error is made the correct letter may be inserted without writing the entire bulletin again. As the keys are struck to produce the letters on the board, the same bulletins are written on paper in the usual way, thus giving a complete record of everything flashed. An interesting feature is the rapidity with which the bulletins may be flashed. An ordinary bulletin may be written in ten seconds, the operator writing just as he would on any typewriter. As the operator can not see the board as he works, a pilot board has been provided directly before him, consisting of sixty green light bulbs. When he strikes a key, the action throws on the corresponding letter, which in turn lights the green bulb corresponding to the number of the monogram in which the letter appears. For instance, if he strikes the 'A' key, with the platen set at No. 1 position, the letter 'A' will appear on the first monogram of the board and No. 1 green light will burn. If it does not burn, the operator knows that the letter did not appear, and he strikes it over."

## NO VITAMINS IN BEER

THE IDEA that there is anything particularly nutritious about beer is negated by an editorial writer in *The Journal of the American Medical Association* (Chicago, November 30). Tests for the vitamins, now generally recognized as necessary elements of foods, have resulted in showing



Courtesy of "The Scientific American," New York.

IT "PRINTS ITS LETTERS AGAINST THE SKY IN LINES OF FLAME."

that they are entirely absent. This is of interest, because, as the editor notes, in the final appeals of the advocates of beer for a hearing in defense of their claims, considerable emphasis has been given to the nutrient properties of the brewed malt beverages. He says:

"As cereals form the basis for the production of beer, the advertising specialist has hit on the clever device of calling this fluid 'liquid bread.' No cogent reason is given, however, why one should depart from the time-honored custom of consuming bread prepared in the more substantial form of a non-alcoholic loaf.

"The discovery that the dietetic value of a food-product can not be determined solely by reference to its calorific value or its content of long-recognized nutrients has introduced new criteria into the study of nutrition. With the recognition of 'quality' distinctions in proteins and the existence of vitamins has come the need of investigation from new and more numerous standards. It has become evident that articles intended for the dietary should be examined and evaluated not only for the usual

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ingredients, but also for the accessory factors which may add to their dietary significance.

"The beer enthusiasts have been quick to grasp the situation. Barley and yeast, both of which are involved in the manufacture of beer, are recognized sources of nutrition-promoting vitamin. It is true that the barley is germinated and heated to produce malt prior to the brewing process. The conjecture that vitamins may be present in beer is, therefore, not an unreasonable one. However, the popular alcoholic beverage is meeting its Waterloo on all sides. An investigation made by Harden and Zilva to test the subject by the physiologic methods now available has given a clear-cut answer. Their conclusion is that bottled ale and stout, and fined beer as brought to the market, are lacking both in the antineuritic and antiscorbutic accessory factors, and kilned malt is also wanting in these two principles. It is an interesting commentary on the alcoholic aspects of the subject that in testing for the antineuritic factor by attempting to cure polyneuritic pigeons it was necessary to remove the alcohol from the beer, lest this component might induce the very disease which the postulated beer vitamin was expected to relieve or avert.

"The truth is the same to-day as it has been for decades. Beer is not chiefly appreciated on account of the nutritious value of its ingredients, nor on account of the by-products of the brewing industry which may help to produce milk and meat. Beer and alcohol still go together; and the claims of alcohol for respectful consideration have been duly considered and found wanting."

### A NEW MOTOR-FUEL

SO MANY "FALSE ALARMS" have raised vain hopes of new motor-fuels that it is refreshing to hear that official tests vouch for a substitute for gasoline which has been named "Liberty fuel," described in *The American Machinist* (New York, December 5). Altho its exact composition and the method of production are not given, we are told that it is derived from a kerosene base by distillation, and that chemical details may be obtained from the United States Bureau of Standards, under whose auspices tests have been made at the United States Naval Academy. According to these tests the new fluid is superior to gasoline in many respects, being non-corrosive, starting easily, leaving no residue, giving greater mileage, and requiring less air for combustion. The cost of production is said to be less than that of gasoline and the quality may be varied in manufacture to suit the requirements of different industries. It is to be hoped that the test of actual daily use on the road, which will not come until the fuel is put upon the market, will bear out these somewhat roseate statements. We read in *The Machinist*:

"Unlike the stories that we have had of new fuels made by dropping some sort of a mysterious pill into water or some other equally inexpensive liquid, this fuel is made from kerosene as a base, as is the case with the gasoline now produced. Nor is it one of those accidents that sometimes occur, but a carefully studied method, the result of seven years' work by Edwin C. Weisgerber, Captain of Engineers in the Division of Research and Development. Captain Weisgerber was fortunately placed under the command of Maj. O. B. Zimmerman, who, with his long experience in internal-combustion motors, not only encouraged him in the face of opposition, but aided him materially by practical suggestions from the motor end.

"The possibility of some such accomplishment has been pointed out by Bacon and Hamor under the heading of 'Per-oxidized Kerosene,' but it remained for the Engineering Division of the Army, in the person of Captain Weisgerber, to make the matter a reality. The great difference between this process and others is that this is a chemical method while the others now employed are mechanical and the possibilities of a greatly increased supply of motor-fuel at a greatly decreased price make the name Liberty particularly appropriate.

"Over seven years ago Captain Weisgerber started work on the problem of finding a gasoline substitute, and his experience took him to various parts of the globe. He had practically perfected the fuel before entering the Army, the additional research and tests giving it the finishing touches. The result is Liberty fuel, which, according to reports of the Division of Research Development, has the following characteristics:

"The fuel is practically scentless and tasteless and the products of combustion are cooler than with gasoline, which reduces the amount of lubricant necessary as well as the problems of cooling. It is also non-corrosive and has a less deleterious effect on motors than gasoline.

"It starts more easily than gasoline and will explode at a temperature below zero, this point being readily controlled in manufacture. It leaves no residue. The effect of the explosion is 30 per cent. greater than gasoline, but this, as well as the quality and specific gravity, can be controlled at will. It will not explode prematurely, and only ignites from spark or flame.

"It has been shown to give greater mileage in airplanes, automobiles, motor-cycles, motor-trucks, and tractors. It requires less air for combustion, can be made at much less cost than gasoline, and uses as a base a product (kerosin) which can readily be obtained in any desired quantity. It can be substituted for gasoline for any purpose. It needs no special apparatus and no special engine or carburetor.

"During the tests at the Naval Air Station at Anacostia, Liberty fuel was found much superior to the best gasoline, and with the motor running 1,600 revolutions per minute the water in the radiator never exceeded 160° F., and the oil in the crank-case did not go above 130 degrees. This quality of maintaining low temperature may help to solve some of the radiation problems of aviation engineers.

"Those interested in the chemical details relating to the temperature of distillation can obtain them from the report of the Bureau of Standards, these tests having been made under the supervision of Dr. Dickinson, who has been in charge of the motor-development tests during the war. The fuel is obtained by distillation and the quality can be varied to suit the requirements of different industries.

"There have been so many false alarms regarding the problem of fuel for internal-combustion motors that one hesitates to become enthusiastic over a question of this kind, but it seems that Major Zimmerman and Captain Weisgerber have succeeded in producing a new Liberty fuel. The need for such a fuel is beyond question, and it is stated that arrangements have been completed for making it available in the near future."

### WASH THE STREETS!

TO DRY-CLEAN a dirty street with scrapers and brooms is no more satisfactory than to rub the body with a dry cloth as a substitute for a bath. Washing is the true method of ridding a surface of undesirable matter, whether that surface is the skin of one's face or the pavement of a thoroughfare. An editorial writer in *Engineering and Contracting* (Chicago, November 28) notifies the managers of water-works plants that tho they do not ordinarily have charge of street-cleaning, it lies within their power to assist, both directly and indirectly, in securing cleaner streets. He goes on:

"And by 'cleaner streets' we do not mean streets free only of visible dirt, but streets free of the invisible microbes that ride upon the finest grains of dust. Water, the great cleanser, should be applied daily in large quantities to all business streets, and at frequent intervals to all paved residence streets. The germ-laden dust should be flushed into the sewers before it can spread pneumonia, tuberculosis, grippe, or influenza, and other diseases of the nose, throat, and lungs.

"It devolves upon every conscientious man who knows the efficacy of water as a sanitary agent to do his best to arouse the public and its representatives to the desirability of flushing all paved streets periodically. The superintendent of every water-works is particularly one who should never rest until his city's streets are as clean as a hospital floor. While it is his duty to prevent the waste of water by meterage and otherwise, it is also his duty to encourage the consumption of more water for sanitary purposes and for garden irrigation. A low per-capita consumption of water should not be his ultimate goal, but rather as high a per-capita consumption as may be attained after eliminating all waste."

Dr. T. D. Lewiston, of San Francisco, wrote recently to *The Chronicle* of his city the following letter, which is reproduced by the writer of the article cited above. Dr. Lewiston, calling attention to what he terms "the unwashed and filthy streets" of San Francisco, says what is no doubt equally true of many other cities when he remarks: