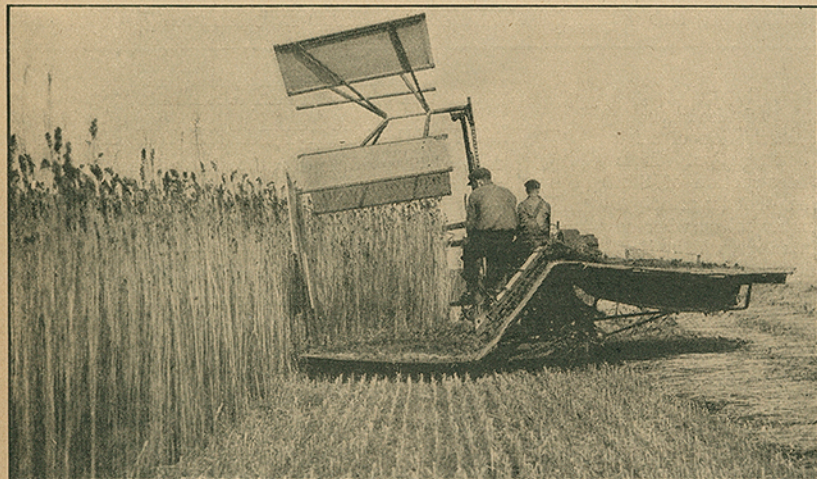


seven cities of the United States during 1920, the infant mortality rates under one month of age varied from 33.6 per 1,000 births in Oakland, Calif., to 53.9 per 1,000 in Lowell, Mass."

The wide range of the rates for the mortality of infants under one month of age suggests, we are told, that there is as yet no established minimum rate and that much of the mortality may be caused by so-called environmental factors which influence also the mortality of infants beyond one month of age. In about half the cities the rate for infants under one month of age is high where there is also a high mortality for the last eleven months of the first year. There is a high degree of correlation between the two sets of figures. To quote further:

"From the facts available for hospital obstetrical services



By courtesy of "The American Thresherman" (Madison, Wis.).

THE MACHINE THAT SAVED THE LIFE OF THE AMERICAN HEMP INDUSTRY.

The competition of cheap foreign labor was putting our hemp raisers out of business when the hemp harvester was devised in Wisconsin to take the place of expensive hand-power methods.

where mothers are brought under instruction and observation early in pregnancy, and are given delivery service and post-partum supervision of the highest order, we learn that the numbers of premature births, deaths of prematurely born babies, still-births, deaths from injury during the delivery process, and fatalities of women following toxemias, sepsis, difficulties with delivery, are reduced far below the level recorded for the general population.

"Pessimism with regard to the saving of early infant life is entirely unwarranted by the facts for small groups which receive adequate obstetrical and nursing care throughout the puerperium. The appalling figures on the destruction of lives full of promise persist because, on a nation-wide scale, practically nothing is being done that can be done. What, for instance, would happen to the still-birth record, if syphilis in the mother could be detected and treated by the methods followed in the obstetrical service of one of the hospitals we know of? How many eclampsias, with their destructive effect upon mothers and infants, could be prevented if methods of prenatal observation and confinement care carried out by another service were to be adopted on a country-wide scale? How many threatened prematurities would be averted by the same sort of care, and how many of the infants whose premature birth is under present conditions unavoidable, could be saved if proper incubation and feeding facilities were available? And probably most important, how many of the fatalities of mothers and babies which result from undue interference with the mechanism of labor and from neglect of strict asepsis, could be averted if the excellent confinement care given by the best maternity hospitals were more generally available?

"Until these questions are frankly answered to the satisfaction of persons acquainted with what has been done under the guidance of able obstetricians, there is no ground whatever for the belief that this death-toll is unavoidable. There is no better example of fallacious reasoning than this encouragement of inactivity in the face of the prevailing waste of infant life."

HEMP THE BAROMETER OF WAR

THE HEMP CROP is thus named by Mark G. Troxell, who writes about it in *The American Thresherman* (Madison, Wis.). In seasons when no one could explain an increased need for hemp, the acreage of this plant has mounted steadily, he says, only to subside after a period of martial turmoil had come and gone. At least three times in our national history hemp has been tried—and not found wanting—as an indicator that war is at hand. He continues:

"It was in 1859 that hemp first revealed its power. The hemp crop that year was the largest we have ever grown. Next year, Lincoln was elected. The Civil War followed. A little later, the hemp acreage slumped sadly to its pre-war figures.

"In the nineties, despite adverse money markets, hemp production began to creep upward. Old Man Hemp was there with the goods when Dewey and Schley needed American-grown fiber for the cordage and caulking of new cruisers and battle-ships. The stress of the Spanish War past, hemp acreage decreased rapidly.

"Lest this leave you unconvinced, look at the American hemp crops produced in 1914-1917 inclusive. From 1,000 tons in 1914, the crop mounted to 4,200 tons in 1915, 9,390 tons in 1916, and 20,600 tons in 1917—which last crop was prepared for the seed before war by the United States was declared! As a result of the careful foresight of this intelligent plant, American soldiers trod French and German soil in shoes stitched with American hemp thread.

"Who pulls the strings? Whence comes this uncanny power? Perhaps a careful study of this old, strange, important, and little-known crop will reveal its weird secret.

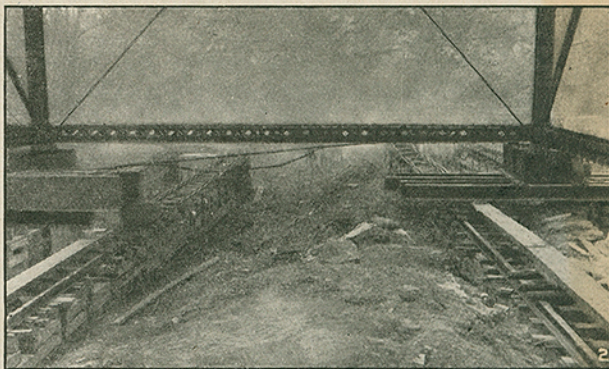
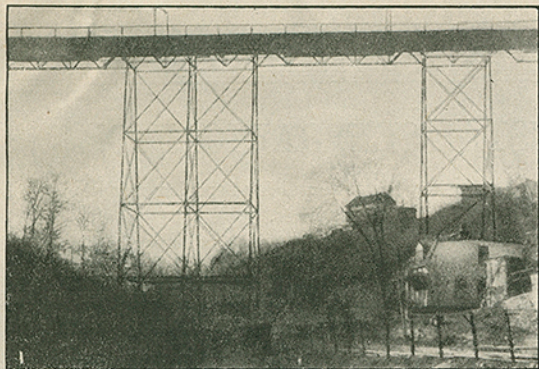
"Long before the United States Navy, in 1824, sanctioned the use of hemp for cables and cordage, Kentucky had been the home of the American hemp industry. Hemp requires fertile soil. The mature plant will produce either seed or fiber, but not both. Not every plant produces seed. The flowers of the male plant produce only pollen; after this is shed, the flowers wither and die, altho the plant is later useful for fiber. The female plants produce the seed.

"Practically all American seed is grown in Kentucky. Altho during the past four years the heart of American hempdom has moved northward, the shorter growing season of Wisconsin has baffled all efforts to mature a short-season seed in that State, and northern growers must depend on Kentucky for an adequate supply of those tiny mottled grains—about the size of the head on a safety match—which produce the warring plants."

Harvesting plants to be used for fiber is a long process, we are told, due to the need of "retting" the stalks. Generally speaking, retting may be called rotting. In Europe, where hand-labor has been cheap, the hemp-growers have followed the practise of water-retting; that is, soaking the plants in water to produce partial decomposition so that the fiber can readily be separated. This is laborious and expensive, but clean hemp—almost white—results.

American hemp-growers rely on dew, light rains, frosts and sunshine to bring about the same result. The fiber is dark-colored, as is commonly seen in coarse twines. To quote further:

"Considering that small grains have been planted, mowed, bound and threshed by machinery for many years in this country, the persistence of hand-power methods in harvesting hemp is truly remarkable. Until 1917, practically all hemp binding was done by hand. In many localities it is still cut, strewn, bound, and broken by tedious hand-work. Industrially speaking, hemp has been a man-killer.



Courtesy of "Engineering News Record," New York.

THE VIADUCT THAT WAS MOVED, AND HOW THE MOVING WAS DONE.

At the left, the viaduct that was moved 75 feet sidewise. At the right, the towers jacked up preparatory to being placed on rollers.

"Here, then, we have the key to the hemp industry of the present, and the keyhole to the future. Even the low-priced labor sections, such as Kentucky still offers in spots, have found themselves unable to maintain hemp as a standard crop. Low-priced foreign labor and, recently, the adverse conditions of international exchange have made old methods of growing and separating hemp economically impossible. By a strange coincidence of fate—typical of the whole history of American hemp—the industry has transplanted itself from its century-old stronghold, Kentucky, to a northern State, once thought impossible as a home for this fiber crop.

"Last year 70 per cent. of all American hemp was grown in Wisconsin. While the Kentucky crop, planted and harvested by negro hand-labor, can not be grown at a profit in the face of foreign competition, Wisconsin's machinery methods have enabled some of her hemp farmers to continue competing with foreign growers. New cutting and binding machines, perfected in the past six years, have proved the salvation of American hemp.

"Starting with only forty acres sown in 1914, Wisconsin's record in 1921 was eight thousand acres planted to hemp. This means a tremendous investment compared to a similar acreage of corn, grain or hay; for to-day any community having a large fiber acreage finds it necessary to build and operate a breaking-mill, costing between fifty and one hundred thousand dollars. A six-year experience has shown that unless six hundred acres of hemp can be planted in one locality, no farmer can afford to begin growing the fiber which makes our twine. The machinery expense becomes too great. As it is, one mower-spreader and one binder are required for practically each hundred acres of hemp. This means an investment of about eight dollars an acre in specialized machinery. Like war itself, hemp requires lots of money.

"In spite of the long history behind hemp as an American crop, the first permanent breaking-mill was built at Brandon as late as 1916, and the second mill at Waupun. More than two-thirds of the hemp mills of the nation are located in Wisconsin; but all expansion of the industry is at a standstill until returns to growers are commensurate to the cost and labor of growing the crop. In 1922 only about one-third of the 1921 acreage was planted in hemp."

FODDER FROM DRIED MILK—Milk is being sacked for indefinite storage as a stock feed. K. L. Hatch, of the Experiment Station of the Wisconsin College of Agriculture, has developed a new process for utilizing hitherto wasted skim-milk, and a jury composed of sixty pigs has been called upon to decide upon the success of his experiments. Says Science Service's *Daily Science News Bulletin* (Washington):

"The new process consists of concentrating the skim-milk in the big vacuum pans of the ordinary condensery. About a 5 to 1 condensation is secured. In this concentrated form, the skim-milk is then mixed with absorbent grains. After the grains have completely absorbed the milk, they are dried in an air current and can be sacked and stored for any length of time.

In this form this creamery by-product can be shipped to all parts of the country without changing the food value in any way, Mr. Hatch claims. It is estimated that thousands of gallons of skim-milk have been dumped into barnyards in the dairy country, because of inability to store it in concentrated form and the necessity of feeding it within twenty-four hours or before it soured. The new dried milk feed is directly due to agitation started when the Wisconsin legislature passed the 'filled milk' bill prohibiting the sale of skim-milk to which a vegetable oil had been added in place of the butter-fat. The 'filled-milk' advocates argued that they were making use of a product that would otherwise be wasted."

MOVING A VIADUCT

A RECORD FEAT in moving a great structure bodily was performed recently in Pittsburgh when a trolley and highway viaduct 150 feet high and 740 feet long was shifted sideways 75 feet. The man who did it, Edward Godfrey, a structural engineer of that city, writes a descriptive article for *The Engineering News Record* (New York), most of which we reproduce below. The object of moving the viaduct, Mr. Godfrey tells us, was to make room for the building of a reinforced-concrete arch bridge. He writes:

"The viaduct is located on the line of the Pittsburgh Railways Co. to Bellevue, a borough adjoining Pittsburgh. It spans the deep hollow of Jacks Run; in its highest portion its floor is about 150 feet above the bottom of the hollow. It was built about 28 years ago, and has since carried the trolley tracks and a highway.

"Some years ago the lattice girders supporting the floor system were reinforced because of rusting and heavier trolley loads. Before the work of moving the bridge was undertaken, the writer made an examination and discovered that the top flanges of the stringers were very badly rusted away, and further reinforcement was needed. The floor system was, therefore, strengthened by the addition of floor beams.

"Because of the great height of the structure, the question of the overturning effect of wind was one of the main features that required attention preparatory to moving. It was dealt with not so much by theory or calculation as by the history of the bridge. Examination of the anchor bolts and bases of the posts showed that the bolts penetrated only the base plates, so that their value was only that of tension on the rivets connecting the angles with the shafts of the posts, and in addition that these bolts (which subsequent operations revealed were good, long bolts, well bedded in the stone caps) were practically devoid of nuts. What nuts had been put on were not drawn up. Some of them lacked three inches of being in contact with the plates. This was a very general condition, being true in particular of the highest towers. In view of the evident uselessness of the anchor bolts and the fact that the bridge had weathered the storms of more than a quarter of a century without any evidence of negative reaction on the bases of the posts, it was considered safe to cut it free for one day while it was being moved, without loading down the columns."