The Emperor Wears No Clothes

Chapter 3

February 1938: Popular Mechanics Magazine:

"NEW BILLION-DOLLAR CROP"

February 1928: Mechanical Engineering Magazine:

"THE MOST PROFITABLE & DESIRABLE CROP THAT CAN BE GROWN"

Modern technology was about to be applied to hemp production, making it the number one agricultural resource in America. Two of the most respected and influential journals in the nation, Popular Mechanics and Mechanical Engineering, forecast a bright future for American hemp. Thousands of new products creating millions of new jobs would herald the end of the Great Depression. Instead hemp was persecuted, outlawed and forgotten at the bidding of W.R. Hearst, who branded hemp the "Mexican killer weed, marihuana."

As early as 1901 and continuing to 1937, the U.S. Department of Agriculture repeatedly predicted that, once machinery capable of harvesting, stripping and separating the fiber from the pulp was invented or engineered, hemp would again be America's number one farm crop. The introduction of G.W. Schlichten's decorticator in 1917 nearly fulfilled this prophesy. (See pages 13-15 and Appendix.)

The prediction was reaffirmed in the popular press when Popular Mechanics published its February, 1938 article, "Billion-Dollar Crop." The first reproduction of this article in over 50 years was in the original edition of this book. The article is reproduced here exactly as it was printed in 1938.

Because of the printing schedule and deadline, Popular Mechanics prepared this article in Spring of 1937 when cannabis hemp for fiber, paper, dynamite and oil, was still legal to grow and was, in fact, an incredibly fast-growing industry.

Also reprinted in this chapter is an excerpt from the Mechanical Engineering article about hemp, published the same month. It originated as a paper presented a year earlier at the February 26, 1937 Agricultural Processing Meeting of the American Society of Mechanical Engineers, New Brunswick, New Jersey.

Reports from the USDA during the 1930s and Congressional testimony in 1937 showed that cultivated hemp acreage had been doubling in size in America almost every year from the time it hit its bottom acreage, 1930 - when 1,000 acres were planted in the U.S. -

to 1937 - when 14,000 acres were cultivated - with plans to continue to double that acreage annual in the foreseeable future.

As you will see in these articles, the newly mechanized cannabis hemp industry was in its infancy, but well on its way to making cannabis America's largest agricultural crop. And in light of subsequent developments (e.g. biomass energy technology, building materials, etc.), we now know that hemp is the world's most important ecological resource and therefore, potentially our planet's single largest industry.

The Popular Mechanics article was the very first time in American history that the term "billion-dollar"* was ever applied to any U.S. agricultural crop!

*Equivalent to $40-$80 billion now.

Experts today conservatively estimate that, once fully restored in America, hemp industries will generate $500 billion to a trillion dollars per year, and will save the planet and civilization from fossil fuels and their derivatives - and from deforestation!

If Harry Anslinger, DuPont, Hearst and their paid-for (know it or not, then as now) politicians had not outlawed hemp - under the pretext of marijuana (see Chapter 4, "Last Days of Legal Cannabis") - and suppressed hemp knowledge from our schools, researchers and even scientists, the glowing predictions in these articles would already have come true by now - and more benefits than anyone could then envision - as new technologies and uses continue to develop.

As one colleague so aptly put it, "These articles were the last honest word spoken on hemp's behalf for over 40 years..."

New Billion-Dollar Crop Popular Mechanics, February 1938

American farmers are promised new cash crop with an annual value of several hundred million dollars, all because a machine has been invented which solves a problem more than 6,000 years old. It is hemp, a crop that will not compete with other American products. Instead, it will displace imports of raw material and manufactured products produced by underpaid coolie and peasant labor and it will provide thousands of jobs for American workers throughout the land. The machine which makes this possible is designed for removing the fiber-bearing cortex from the rest of the stalk, making hemp fiber available for use without a prohibitive amount of human labor. Hemp is the standard fiber of the world. It has great tensile strength and durability. It is used to produce more than 5,000 textile products, ranging from rope to fine laces, and the woody "hurds" remaining after the fiber has been removed contains more than seventy-seven per cent cellulose, and can be used to produce more than 25,000 products, ranging from dynamite to Cellophane.

Machines now in service in Texas, Illinois, Minnesota and other states are producing fiber at a manufacturing cost of half a cent a pound, and are finding a profitable market

for the rest of the stalk. Machine operators are making a good profit in competition with coolie-produced foreign fiber while paying farmers fifteen dollars a ton for hemp as it comes from the field.

From the farmers' point of view, hemp is an easy crop to grow and will yield from three to six tons per acre on any land that will grow corn, wheat, or oats. It has a short growing season, so that it can be planted after other crops are in. It can be grown in any state of the union. The long roots penetrate and break the soil to leave it in perfect condition for the next year's crop. The dense shock of leaves, eight to twelve feet about the ground, chokes out weeds. Two successive crops are enough to reclaim land that has been abandoned because of Canadian thistles or quack grass.

Under old methods, hemp was cut and allowed to lie in the fields for weeks until it "retted" enough so the fibers could be pulled off by hand. Retting is simply rotting as a result of dew, rain and bacterial action. Machines were developed to separate the fibers mechanically after retting was complete, but the cost was high, the loss of fiber great, and the quality of fiber comparatively low. With the new machine, known as a decorticator, hemp is cut with a slightly modified grain binder. It is delivered to the machine where an automatic chain conveyer feeds it to the breaking arms at the rate of two or three tons per hour. The hurds are broken into fine pieces which drop into the hopper, from where they are delivered by blower to a baler or to truck or freight car for loose shipment. The fiber comes from the other end of the machine, ready for baling.

From this point on almost anything can happen. The raw fiber can be used to produce strong twine or rope, woven into burlap, used for carpet warp or linoleum backing or it may be bleached and refined, with resinous by-products of high commercial value. It can, in fact, be used to replace the foreign fibers which now flood our markets.

Thousands of tons of hemp hurds are used every year by one large powder company for the manufacturer of dynamite and TNT. A large paper company, which has been paying more than a million dollars a year in duties on foreign-made cigarette papers, now is manufacturing these papers from American hemp grown in Minnesota. A new factory in Illinois is producing fine bond papers from hemp. The natural materials in hemp make it an economical source of pulp for any grade of paper manufactured, and the high percentage of alpha cellulose promises an unlimited supply of raw material for the thousands of cellulose products our chemists have developed.

It is generally believed that all linen is produced from flax. Actually, the majority comes from hemp - authorities estimate that more than half of our imported linen fabrics are manufactured from hemp fiber. Another misconception is that burlap is made from hemp. Actually, its source is usually jute, and practically all of the burlap we use is woven by laborers in India who receive only four cents a day. Binder twine is usually made from sisal which comes from Yucatan and East Africa.

All of these products, now imported, can be produced from home-grown hemp. Fish nets, bow strings, canvas, strong rope, overalls, damask tablecloths, fine linen garments,

towels, bed linen and thousands of other everyday items can be grown on American farms. Our imports of foreign fabrics and fibers average about $200,000,000 per year; in raw fibers alone we imported over $50,000,000 in the first six months of 1937. All of this income can be made available for Americans.

The paper industry offers even greater possibilities. As an industry it amounts to over $1,000,000,000 a year, and of that eighty per cent is imported. But hemp will produce every grade of paper, and government figures estimate that 10,000 acres devoted to hemp will produce as much paper as 40,000 acres of average pulp land.

One obstacle in the onward march of hemp is the reluctance of farmers to try new crops. The problem is complicated by the need for proper equipment a reasonable distance from the farm. The machine cannot be operated profitably unless there is enough acreage within driving range and farmers cannot find a profitable market unless there is machinery to handle the crop. Another obstacle is that the blossom of the female hemp plant contains marijuana, a narcotic, and it is impossible to grow hemp without producing the blossom. Federal regulations now being drawn up require registration of hemp growers, and tentative proposals for preventing narcotic production are rather stringent.

However, the connection of hemp as a crop and marijuana seems to be exaggerated. The drug is usually produced from wild hemp or locoweed which can be found on vacant lots and along railroad tracks in every state. If federal regulations can be drawn to protect the public without preventing the legitimate culture of hemp, this new crop can add immeasurably to American agriculture and industry.

The Most Profitable and Desirable Crop That Can be Grown

Mechanical Engineering, February 26, 1937

"Flax and Hemp: From the Seed to the Loom" was published in the February 1938 issue of Mechanical Engineering magazine. It was originally presented at the Agricultural Processing Meeting of the American Society of Mechanical Engineers in New Brunswick, NY of February 26, 1937 by the Process Industries Division.

Flax and Hemp: From the Seed to the Loom

By George A. Lower

This country imports practically all of its fibers except cotton. The Whitney gin, combined with improved spinning methods, enabled this country to produce cotton goods so far below the cost of linen that linen manufacture practically ceased in the United States. We cannot produce our fibers at less cost than can other farmers of the world. Aside from the higher cost of labor, we do not get as large production. For instance, Yugoslavia, which has the greatest fiber production per are in Europe, recently had a yield of 883 lbs. Comparable figures for other countries are Argentina, 749 lbs.; Egypt 616 lbs.; and India, 393 lbs.; while the average yield in this country is 383 lbs.

To meet world competition profitably, we must improve our methods all the way from the field to the loom.

Flax is still pulled up by the roots, retted in a pond, dried in the sun, broken until the fibers separate from the wood, then spun, and finally bleached with lye from wood ashes, potash from burned seaweed, or lime. Improvements in tilling, planting, and harvesting mechanisms have materially helped the large farmers and, to a certain degree, the smaller ones, but the processes from the crop to the yarn are crude, wasteful and land injurious. Hemp, the strongest of the vegetable fibers, gives the greatest production per acre and requires the least attention. It not only requires no weeding, but also kills off all the weeds and leaves the soil in splendid condition for the following crop. This, irrespective of its own monetary value, makes it a desirable crop to grow.

In climate and cultivation, its requisites are similar to flax and like flax, should be harvested before it is too ripe. The best time is when the lower leaves on the stalk wither and the flowers shed their pollen.

Like flax, the fibers run out where leaf stems are on the stalks and are made up of laminated fibers that are held together by pectose gums. When chemically treated like flax, hemp yields a beautiful fiber so closely resembling flax that a high-power microscope is needed to tell the difference - and only then because in hemp, some of the ends are split. Wetting a few strands of fiber and holding them suspended will definitely identify the two because, upon drying, flax will be found to turn to the right or clockwise, and hemp to the left or counterclockwise.

Before [World War I], Russia produced 400,000 tons of hemp, all of which is still hand-broken and hand-scutched. They now produce half that quantity and use most of it themselves, as also does Italy from whom we had large importations.

In this country, hemp, when planted one bu. per acre, yields about three tons of dry straw per acre. From 15 to 20 percent of this is fiber, and 80 to 85 percent is woody material. The rapidly growing market for cellulose and wood flower for plastics gives good reason to believe that this hitherto wasted material may prove sufficiently profitable to pay for the crop, leaving the cost of the fiber sufficiently low to compete with 500,000 tons of hard fiber now imported annually.

Hemp being from two to three times as strong as any of the hard fibers, much less weight is required to give the same yardage. For instance, sisal binder twine of 40-lb. tensile strength runs 450 ft. to the lb. A better twine made of hemp would run 1280 ft. to the lb. Hemp is not subject to as many kinds of deterioration as are the tropical fibers, and none of them lasts as long in either fresh or salt water.

While the theory in the past has been that straw should be cut when the pollen starts to fly, some of the best fiber handled by Minnesota hemp people was heavy with seed. This point should be proved as soon as possible by planting a few acres and then harvesting the first quarter when the pollen is flying, the second and third a week or 10 days apart,

and the last when the seed is fully matured. These four lots should be kept separate and scutched and processed separately to detect any difference in the quality and quantity of the fiber and seed.

Several types of machines are available in this country for harvesting hemp. One of these was brought out several years ago by the International Harvester Company. Recently, growers of hemp in the Middle West have rebuilt regular grain binders for this work. This rebuilding is not particularly expensive and the machines are reported to give satisfactory service.

Degumming of hemp is analogous to the treatment given flax. The shards probably offer slightly more resistance to digestion. On the other hand, they break down readily upon completion of the digestion process. And excellent fiber can, therefore, be obtained from hemp also. Hemp, when treated by a known chemical process, can be spun on cotton, wool, and worsted machinery, and has as much absorbency and wearing quality as linen.

Several types of machines for scutching the hemp stalks are also on the market. Scutch mills formerly operating in Illinois and Wisconsin used the system that consisted of a set of eight pairs of fluted rollers, through which the dried straw was passed to break up the woody portion. From there, the fiber with adhering shards - or hurds, as they are called - was transferred by an operator to an endless chain conveyer. This carries the fiber past two revolving single drums in tandem, all having beating blades on their periphery, which beat off most of the hurds as well as the fibers that do not run the full length of the stalks. The proportion of line fiber to tow is 50% each. Tow or short tangled fibers then go to a vibrating cleaner that shakes out some of the hurds. In Minnesota and Illinois, another type has been tried out. This machine consists of a feeding table upon which the stalks are placed horizontally. Conveyor chains carry the stalks along until they are grasped by a clamping chain that grips them and carries them through half of the machine.

A pair of intermeshing lawnmower-type beaters is placed at a 45-degree angle to the feeding chain and break the hemp stalks over the sharp edge of a steel plate, the object being to break the woody portion of the straw and whip the hurds from the fiber. On the other side and slightly beyond the first set of lawnmower beaters is another set, which is placed 90-degrees from the first pair and whips out the hurds.

The first clamping chain transfers the stalks to another to scutch the fiber that was under the clamp at the beginning. Unfortunately, this type of scutcher makes even more tow than the so-called Wisconsin type. This tow is difficult to reclean because the hurds are broken into long slivers that tenaciously adhere to the fiber.

Another type passes the stalks through a series of graduated fluted rollers. This breaks up the woody portion into hurds about 3/4 inch long, and the fiber then passes on through a series of reciprocating slotted plates working between stationary slotted plates.

Adhering hurds are removed from the fiber which continues on a conveyer to the baling press. Because no beating of the fiber against the grain occurs, this type of scutcher makes only line fiber. This is then processed by the same methods as those for flax.

Paint and lacquer manufacturers are interested in hempseed oil which is a good drying agent. When markets have been developed for the products now being wasted, seed and hurds, hemp will prove, both for the farmer and the public, the most profitable and desirable crop that can be grown, and one that can make American mills independent of importations.

Recent floods and dust storms have given warnings against the destruction of timber. Possibly, the hitherto waste products of flax and hemp may yet meet a good part of that need, especially in the plastic field which is growing by leaps and bounds.