HOMEMADE WINDMILLS IN NEBRASKA.

In the current issue of the SUPPLEMENT we begin a most interesting series of articles on "The Homemade Windmills of Nebraska," by Erwin Hinckley Barbour. The articles will run through several numbers and will be accompanied by over thirty illustrations. To those who may be unfamiliar with these windmills they will be a revelation, and the importance of this movement inaugurated by the inventive farmers of Nebraska is made manifest, in that many acres of garden truck, fruit land, and even farm land are irrigated at a trifling expense. Stock is supplied with water, ranchmen and sheepherders are benefited, dairy products are increased and improved, and the comfort of the village and the rural home is often enhanced. The merits of these homemade mills have enjoyed such prompt recognition that they are going up daily, not to the detriment, however, of windmills which are made by regular manufacturers, but in addition to them. In a given community the man who puts up the first mill generally furnishes the model for the rest of the neighborhood, hence it seems desirable that good models should be used, as illustrated in Mr. Barbour's paper. All of the leading types are shown, and they may serve as models, and with the aid of a few types, almost anyone can construct windmills which will prove of substantial benefit to their constructors. The author has visited a large number of mills in various parts of the State of Nebraska and in other States, and his writings on the subject give proof of an intimate acquaintance with the subject.

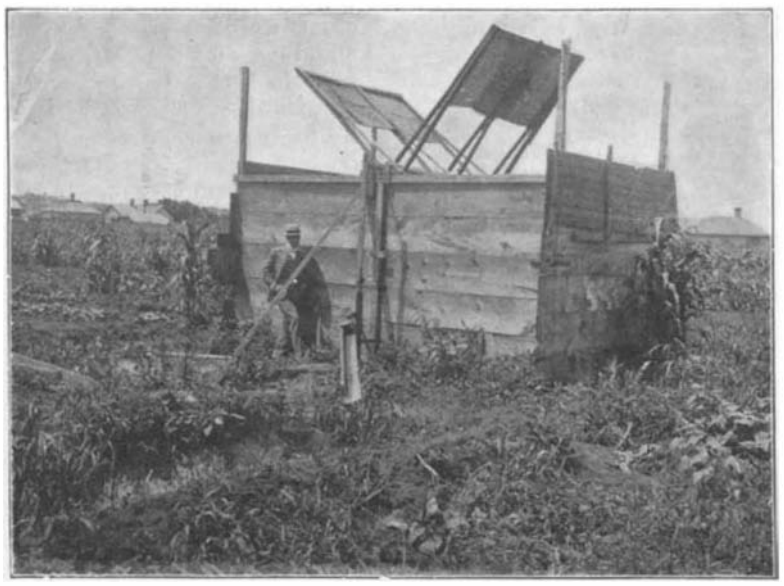
The builders of homemade mills in Nebraska are generally the wealthy and more progressive among the older and well-established farmers or else younger men just making a start, and not the roving, unsettled or shiftless class. Some of the beginners use the homemade mill for the irrigation of the garden and for supplying the house, and others make luxuries of them rather than necessities. They put them to work in various ways to save hand labor, such as running a grindstone, churning, working a feed grinder, corn sheller, the wood saw and other farm machinery. The cost of these windmills is not great. In dollars and cents the average mill will not fall far from four or five dollars, not including the labor. Such mills are usually put up at odd times and made out of material at hand, such as old lumber, poles and hardware common to every farm. Some builders by a display of superior management erect excellent mills at a nominal extra expense of one or two dollars for labor and hardware. Some mills will be found doing good service which cost but $1.50, and from this there is every gradation in the price of mills up to $150, which gives an efficiency of 8 horse power and is capable of grinding food for the stock at the rate of 200 to 300 bushels of grain per day, according to the wind.

Mr. Barbour divides the mills into "Jumbos," "Merry-go-Rounds," "Battle Ax," "Holland" and "Mock Turbines." This includes all of the main types of the homemade mills known at present.

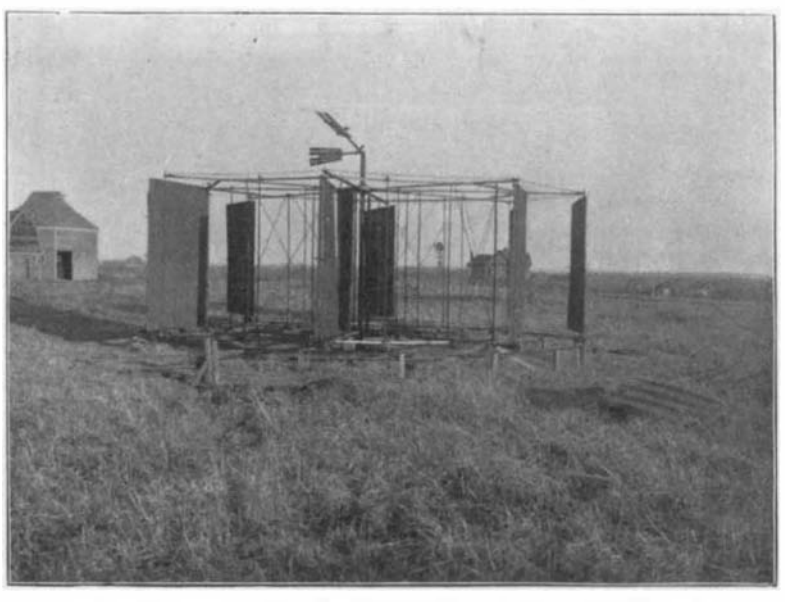
The "Jumbo" or "Go-devil" as some call it is very like an old-fashioned overshot wheel. They lend themselves readily to construction, being very simple in design, and they are very economical, owing to the fact that old lumber, laths, shingles, split rails, tin from old roofs, etc., can be pressed into service in the construction of these mills, and even the useful tin can unsoldered can be utilized for nailing on the loose sides of the Jumbo box. The efficiency of the Jumbo mills is low, but this is compensated for by the fact that they are comparatively inexpensive to build, for a good mill of this type can be built for $3, and a better one for $8. Some have been built large enough to irrigate ten acres of orchard. The smaller Jumbos, termed "Baby Jumbos," are very small mills. They are generally mounted on abandoned towers or upon buildings, while the larger mills of the same class are set upon the ground and securely anchored there. They are all set so as to catch to best advantage the prevailing wind of the place, which is north and south in Nebraska.

The construction of the Jumbo mill will be understood by reference to our first engraving, which shows one which was made at an expense of $8. The sails are made of old coffee sacks, and the cut-offs or wind guards may be seen at either side. They are raised and lowered by pulley and rope. The dimensions are 13 feet long, 9 feet wide and 13 feet high. This mill successfully irrigates a five acre garden. The reservoir supplied by this mill is 150 feet long by 4 feet wide and 2 or 3 feet deep. The sliding doors may be raised or lowered so as to cut off more or less of the force of the wind from the fans, as is rendered necessary by winds of varying velocities. Sometimes these Jumbo windmills are built one north and south and the other east and west, so as to insure service whatever the direction of the wind.

In the "Merry-go-Round" mill is found another attempt at the construction of mills of unlimited size. These mills are rather complex in construction and are not put up by the farmer, but by a carpenter and at a considerable expense. Mounted upon towers like ordinary turbine mills of the manufacturer, they soon reach a size at which the wind can upset them, however well anchored. This has led to the towerless mills which stand low upon the ground, and consequently are capable of a greater circumference. These mills consist of a number of fans revolving about a central axis. About the same axis usually revolves a semicircular hood, thus exposing half of the fans and shielding the other half, the shield running upon friction rollers. When the mills are to be thrown into gear, the cord simply revolves until it covers all the fans on the windward side. Small and medium sized mills may be constructed in this way. A larger Merry-go-Round is that built by S. S. Videtto on a ranch near Lincoln, Neb.; it is shown in our engraving. This mill has a diameter of 40 feet and the fans are 12 to 14 feet high. The whole structure is carefully designed and well made, being solidly braced, and runs upon a circular steel rail. This is an experimental mill, and it is hoped that this or some other equally powerful mill may yet be perfected.



HOMEMADE "JUMBO" WINDMILL, LINCOLN, NEBRASKA.



A "MERRY-GO-ROUND" WINDMILL, LINCOLN, NEBRASKA.

Mr. Barbour then goes on to describe turbines or open-faced mills, which include the "Battle Ax" mills, the "Holland," which resembles the well-known type used in Holland, and the "Mock Turbines," which resemble the manufactured article so closely as to be scarcely distinguishable at times. The subject is a most interesting one, with which all our great agricultural class should be acquainted.

Manila Hemp.

In one product, at least, the Philippines lead the world. Nowhere else has it been found possible to produce a quality of hemp to rival that grown in some of the Philippine Islands.

The hemp industry is not one of very large proportions, nor is it one capable of indefinite extension, for the possibilities of production endlessly outstrip the probabilities of consumption, and this fact must be taken into consideration. Thus far, says The Evening Post, from which we glean our facts, little or no use has been found for hemp fiber, save in the line of twine and cordage, although it probably has some possibilities in the line of woven cloths for special purposes. The annual output of Manila hemp may be taken roundly as 100,000 tons. The value ranges from $45 to $100 per ton, and the average total value of the product may be taken as approximately $8,000,000. Unless some new use can be found for the material, any great increase in the production would tend to a reduction in price by which it could be brought into competition with materials now used as substitutes, and the loss would lie with the producer.

The methods employed are of the crudest. The plant belongs to the plantain or banana family, which sends up a stout trunk or stalk which reaches its maturity in three or four years. The stalk will run from six to eight inches in diameter and is crowned with long, massive, and arching leaves which are so well known by illustrations. There is a central body of pith in the stalk surrounded by filaments embedded in sappy, vegetable matter. The filaments constitute the hemp of commerce, and their extraction from the stalk constitutes the process of hemp production. The cutting is done with a single stroke of a knife which corresponds to the Cuban machete. The fallen stalk is stripped of the fiber-bearing petioles, which are cut into ribbons five or six inches in width, and of a length determined by their growth. The next process is where it invites and demands the genius of the inventor to devise an instrument or chemical process by which the sappy vegetable matter may be separated from the fiber without injury to the latter. In the present system a rude trestle is constructed supporting a knife secured by a hinge at one end while the other is operated by the upward pull of a flexible stick, acting as a spring, whose force is counteracted by attachment to the treadle controlled by the foot of the worker. Thus, by gradually releasing the pressure, the operator regulates the bearing force of the knife and overcomes the inequalities of thickness. There might be some difficulty in the construction of a machine which will adjust itself automatically to the various thicknesses of the petioles and the varying tensile strength of the fiber. It must also be free from danger of discoloring the fiber, to which it is very liable and which lowers its market value. The denuded fiber is then dried and is ready for the market. The material arrives in small, rough bundles, in which it is packed by the peasants. It is sorted and weighed out in lots weighing 280 pounds for baling. These lots are stowed in roughly-made cribs and are then trampled down under the feet of the men, who jump and dance upon it until there is a suitable quantity in the crib. The crib is then moved under a rude screw-press operated by four men, who stand on a platform and turn the screw by means of capstan bars. A more powerful screw-press worked by twenty or thirty men is then used. After the mass is reduced to the proper size, it is bound with bamboo, and the bale of hemp is ready for marketing and shipment. It would seem to be an excellent opportunity to introduce American presses.

Discovery of New Invertebrates in the Dinosaur Beds of Wyoming.

Prof. E. H. Barbour, of the University of Nebraska, in an address delivered August 25, 1899, at the Ohio State University, Columbus, O., before the Geological Section of the American Association for the Advancement of Science, states that it will undoubtedly be of interest to this section of the American Association to learn of the discovery of a bed of invertebrate fossils in the Dinosaur beds of Wyoming. Hitherto almost no invertebrates have been reported from this bed. It was my privilege to accompany the Fossil Field Expedition, sent out by the courtesy of the Union Pacific Railway Company, July 21, 1899. In company with Prof. Knight, director of the expedition, while locating Dinosaur bones, we came unexpectedly upon a small exposure of very fossiliferous limestone of compact crystalline structure.

The fossils were admirably preserved in this dense matrix, and it is possible with study to make out their minuter structure. Superficial examination goes to show that these fossils are fresh water forms, and to that extent the prevailing idea of the fresh water origin of the Dinosaur beds is substantiated and sustained. It is safe to say that in the large amount of this material collected some eight or ten species, possibly several more, can be made out, when it is worked over in the laboratory. In the field we were able to recognize at least three distinct Lamellibranchs. The external and the internal markings are sharp and distinct, so as to admit of exact determination. Of the Gasteropods there were at least three and probably five distinct forms, all small but finely preserved. Besides there were several teeth (Crocodilian) and fragments of bone. Later, when the boxes have been unpacked and the material worked over, a formal report with list of genera and species will be submitted.