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SUGAR AND FODDER, IN ONE.

In discussing recently the future sugar of the United States, under the title of "The Sugar Canes," a number of points were necessarily left untouched, and the subject is one of such exceedingly great interest that it is worth while to recur to it again and again. In that article, while urging that we ought to become exporters of sugar instead of importers, it was remarked that by so doing we need not interfere with any crop now cultivated. We will see if that remark was not strictly in accordance with truth. We can scarcely afford to cut off any of our present resources, even for the sake of getting new ones.

Of course it is understood, from what has been previously written, that our proposed supply of sugar for the future is to come from sorghum, and our expectations and promises are based on the recent advances in chemical and manufacturing knowledge, by means of which the crystallization of sugar from sorghum is no longer a matter of caprice and uncertainty, but becomes an established business fact.

Sorghum, as is well known, can be grown, as a general rule, wherever Indian corn can be raised satisfactorily; and it has this advantage in point of success, that it thrives well on land which is too poor to yield any more than a very indifferent crop of corn. It follows that the regions of extended corn growing are likely to be also the regions demanded for sorghum when we come to produce our 2,000,000,000 pounds of sugar and then go on beyond that to supply the foreign market.

Shall we not, therefore, cut off our supply of corn? If we turn our corn-fields into sugar-fields, are we not about to diminish our yield of beef and of pork, the very bone and sinew of the nation? And shall we not deprive our people of the "hominny" as well as the "hog," which have been inelegantly said to furnish the staple food of many millions in our southern and western border lands?

If it could be shown that the widespread cultivation of sorghum for sugar production would result in a diminished food supply for either man or beast, a strong argument would at once be found against such cultivation, notwithstanding the fact that pecuniarily it was more profitable. But we propose to show that no such diminution need occur, or will occur, even assuming that not an acre of additional land should be brought into use. Our great corn-producing sections, the broad plains of the Western and Northwestern States, which will presently be waving in every direction with magnificent cane-fields of sorghum, contain, as yet, almost illimitable ranges which have never felt the plow, and the natural progress of population and of industry will, in due time, sweep them within the area of our wealth-yielding lands. But, even without them, we can produce our full measure of sugar, as already given—2,000,000,000—and hog and hominy shall still prevail, as now. The present corn-fields, "from Ohio to Nebraska, and from Kentucky to Minnesota, can do it all."

To make our position plain, we will assume a definite case. A farmer in Iowa has this year 100 acres in corn. The records of the State show that his average yield may be expected at 3,800 bushels, worth in round numbers \$500. Of this he consumes, on the premises, we will say 2,500 bushels, selling the remainder. Of this 2,500 bushels by far the largest portion has gone as food for his hogs, horses, etc. The human consumption, according to the number in his family, has not in all probability exceeded 100 bushels. He needed therefore to supply his family with their direct corn-food only three acres of corn; and to supply his stock he needed sixty-five acres, and outside of this he had a money value of corn sold of \$310.

Now turn the slate, and cipher on the other side. The next year he plants corn for his family, say ten acres, so as to allow a free margin, and his remaining ninety acres he plants in sorghum, the variety selected being according to his locality. The one feature which above all others is essential to his getting the value from his sorghum as a sugar producer is that the crop should become perfectly mature, the seed fully ripe. And here is where the two values of his crop coincide in giving him their returns. Experience abundantly shows that sorghum seed, as food for live stock, is equal in every respect to Indian corn. Cattle, horses, hogs, eat it freely and thrive upon it to perfection. When thoroughly ripe, its fattening qualities are not at all surpassed by those of the corn; and acre for acre, the yield of an average crop of ripe sorghum is equal in feeding value to an average crop of corn.

How does our farmer's account therefore stand as compared with last year's returns? His family have had their supply as then; on his sixty-five acres he has fed the same amount of stock as then; on his remaining 25 acres he has realized seed which has enabled him to feed a proportionately increased number of hogs, or of mules, or of whatever stock he has chosen, and he has their value in return, but he has not his \$310 for sales of corn.

Is the wealth of the country diminished because the farmer planted ninety acres in sorghum instead of in corn? It has received all the pork and beef that it did before, and in addition the pork and beef represented by the twenty-five acres. And what has the farmer in exchange for his \$310 of corn money?

Mr. A. J. Russell, of Janesville, Wis., President of the Wisconsin Amber-Cane Growers' Association, reports to the Hon. Geo. B. Loring, U. S. Commissioner of Agriculture, in Dec., 1881, that the yield from sorghum per acre there was 1,000 pounds of sugar, selling for nine cents per pound, with sirup worth half as much in addition. And Mr. Rus-

sell expressly states that this is no fair return, inasmuch as the farmers, from lack of knowledge as to fertilizers, etc., had produced on an average only about half of what might fairly be expected, and of what would actually be yielded in the future. He had himself produced 2,000 pounds to the acre, with sirup in proportion.

But taking the returns only as given at these lowest figures, an acre yields \$130. We do not dare to multiply that by the 90 which represents the number of acres which our farmer had in sorghum, for fear the figures should seem too flattering for belief, but there they are, and any one can take the slate and pencil and work out the sum for himself. We will only remark that the farmer did not lose by giving up the crop of Indian corn, even if he lost his \$310.

Now, let no one suppose that we are going off in wild visions of boundless wealth to tumble into every man's pocket from sorghum growing. It is no more certain than everything else of human labor. Crops will fail, as crops of all sorts fail. But crops also will succeed, and where Indian corn will produce its value, sorghum will also produce its own value, and the relative value of the two on a hundred acres we have considered.

PETROLEUM—THE OLD IN THE NEW.

Perhaps never in the world's history has there occurred a case in which an article known from time immemorial, and counted as being of too small value to have any influence whatever, has all at once become one of the forces which sway the commerce, and almost the destinies of nations, to an extent so wonderful as is actually true in regard to petroleum. Its progress, its development, the grasp which it has on the welfare, the politics, and the destiny of various countries, above all others, of our own, deserve a careful study. A few words in relation to one feature of its history are all that our present space will allow; we may recur to it at another time.

When we look into the columns of the various daily papers, the Times, Tribune, Herald, etc., and see with how much care the petroleum column is worked up, how its daily, and sometimes hourly, fluctuations are studied and quoted, and when we read a little further and see what enormous amounts of the crude article are brought to the seaports—New York, of course, chiefly—and what immense shipments are made to the very ends of the earth (for China, on the opposite side of the globe, is becoming now one of our very thirsty absorbents), we find it difficult to realize that all this is only a thing of yesterday, as it were. And yet that is strictly true. Forty years ago the word petroleum had no existence in current language. It is a compound term meaning simply rock oil; it was in the dictionaries, but it was not known to people in general. And yet the article at that time was on sale, in the large cities, and occasionally in swaller places. But it was in very small quantities, and was disposed of by the ounce. Very probably the entire stock on hand in the city of New York could have been held in a few five gallon cans. Those who are old enough to remember as far back as 1840 can possibly recall a very bad-smelling medicine to which they were perhaps subjected. It was called Seneca Oil, and was "dreadful good for the rheumatiz," being fortunately, in most instances, used externally, though not always. It was understood to be brought from the "Seneca Nation," in the Southwestern part of the State of New York; hence its name. Seneca oil was simply crude petroleum, and it is on the instant recognized that it came from the immediate vicinity, the very border of the region which has within these later years revolutionized the world with its oil wells.

But in going back to Seneca oil do we touch the early days of petroleum? Not at all; and we shall never touch them. No glimmering light shines back so far. When the fires fell on the Cities of the Plain, in the circuit of Jordan, at the north end of the Dead Sea, the combustible material which insured the destruction of Sodom and Gomorrah was crude petroleum, the "slime pits" of the Vale of Siddim. Later still petroleum, in its viscid form, served to make watertight the cradle of the baby Moses. But both these instances are relatively of modern date; for perfectly untold ages before that time petroleum had served to aid in preserving the Egyptian dead from decomposition, for the very oldest of all the mummies yet brought to light reveal its presence. And how early in the experience of the human race its remarkable properties were brought into play we can only conjecture, for nothing remains to tell us.

Petroleum, therefore, has two histories, and they may be said to be as distinct from each other as though they were of two separate articles. The old reaches back, so we have seen, to the days of shadow and fable; the new begins August 6, 1859, only twenty-four years ago! And it begins at Titusville, on Oil Creek, a branch of the Alleghany River, in Crawford County, Pennsylvania. To such narrow limits in both time and space are we able to concentrate our attention, and yet we are looking at that which has become one of the mighty factors in modern civilization.

Now once more we will see what we can do in the work of bringing our ideas to a focus, and this time we will look at the subject geographically. Petroleum is found in very various parts of the world, in fact, almost in every country, to some extent. There are, however, certain points of concentration, and they are not many. The island of Zante, the mainland opposite in Hungary, Galicia, and Moldavia; then, again, away off on the Irawaddy, but most of all—on the Eastern Continent—the shores of the Caspian, especially near Baku; all of these produce petroleum, and the springs