

Rural Economy.

BEEF SUGAR.

That this country, even in its middle and northern portions, may be able to produce its own supply of sugar, seems now probable from the following account—written by a correspondent and we believe an editor of the N. Y. Tribune—of the progress made in the culture of the beet and its conversion into sugar in the State of Illinois. The facts stated are very interesting and important:

"We think we have important news regarding beet sugar. Last year a number of enterprising capitalists of Springfield, Ill., organized a company for the purpose of making beet sugar. The place selected was at Chatsworth, Livingston County, Ill., and the works were under the direction of the Messrs. Gennert, the original projectors.

"They planted 400 acres, mostly fresh prairie, and raised a crop of 4,000 tons of fine beets, at a cost of \$4 a ton in the pits. The varieties were the White Siberian and the Imperial, and upon a test of various parts of the crop, the average yield of fair refining sugar is 74 per cent. This is confirmed by analysis made at Belcher's sugar refinery, St. Louis. When refined, the yield is 54 per cent. of sugar, equal to New York refined B. Quite a number of barrels have been made, and the works are in operation this winter. When all the beets are worked up, the yield must reach nearly 400,000 pounds of refined sugar. The starting of new works and expensive machinery is always difficult, and this company has had its share, and there has been delay. But this delay has been of use in settling the question whether beets can be kept in large quantities during the fall and winter months. They find that the loss during four months is only one per cent. The conclusion of this vast experiment, worthy of the Prairie State, is, that beets can be grown on the raw but rich soil of the West, as well as on the highly fertilized soils of Belgium and France; that the yield of sugar is almost precisely the same, and that the beets can be kept till they can be used.

The importance of these facts scarcely can be over estimated. The prairie region is equal in extent to England, France, Spain, and Portugal combined, and on almost every acre the beet can be cultivated. Underlying are inexhaustible beds of coal; and a people fully competent to enter upon this new enterprise are ready. Sugar is next in importance to wheat. A beet sugar crop on these prairies will be of greater value than the corn crop. Granting these to be facts, the time cannot be distant when sugar will be sent from the West to New York, and exported to foreign countries.

HOG-RAISING.

It is well known to farmers who are versed in the science of hog-raising that the pigs of a well-bred and well-fed sow, after they are a few days old, instinctively choose their places at the udder of the dam; each little pig selecting its own peculiar teat; and when they take their food, each one, amid the rush and rattle and tumble, fetches up in his proper place with as much accuracy as a well-trained family of children come to the dinner-table. The smallest, the runt, or what in common parlance is called the "titman," finds himself crowded to the last teat at the rear end of the udder. If the number of pigs be greater than the number of teats, the weakest pig cannot be reared. We have in mind an instance in which the brood of pigs numbered one more than the teats on the udder of the sow. The smallest pig had no place at the dinner-table. After a few days the little thing, wofully emaciated and sickly, died of utter starvation. In every brood of pigs, in every flock of lambs, in every herd of neat cattle, in every drove of horses, in every nest of birds, in every brood of domestic fowls, in every ear of grain, Dame Nature makes provision for the propagation of its kind, by concentrating the excellencies of that species in one seed or one animal which are to be transmitted to the offspring or products of the race or kind. This is an established and incontrovertible law; and its manifestations are recognized in both the animal and in the vegetable kingdom.

In reverting again to the brood of swine, the poorest pig, which corresponds to the shrunken, half-developed nubbins of corn, or to the small kernels on the tip-end of the ear of grain, lives at the rear end of the udder. Pigs reared here are utterly unfit for breeders, whether male or female; because they are destitute of that prolificacy which is common to the pigs that suck the forward teats. Why do many sows of choice breeds bring forth only two or three pigs at one litter, when they ought to produce as many as there are teats on the udder? And why do some sows always drop as many pigs as they are able to rear? In the former instance they show ill-breeding—that seed animals were selected at random, without any reference to their prolificacy. In the latter instance we have the assurance that the dam possesses many of those qualities which a skillful breeder desires to have transmitted to the young stock. Let the "titman" be selected from a brood sow, and let the runt in her brood for a breeder, and let the titman of the next brood be saved as a breeder, and it will be found that in a short period of time there will be a wonderful degeneracy, which cannot be repaired by the most judicious system of breeding for a decade of years. On the contrary, select the female pig that sucks the forward teat, and continue to choose the "sow-pig that sucketh before" for a brood animal, and every year will disclose most satisfactory developments in the form and symmetry of the herd of swine.

Blood will tell. We cannot transcend nor thwart the established and unalterable law of the animal kingdom. In the pigs that

are reared at the forward end of the udder is concentrated a greater degree of prolificacy, and greater power to transmit more of the excellent points which constitute the perfect animal, than can be found in any other pigs in the brood. And these are the only ones that ever should be saved as breeders, whether male or female. The second or third pig from the front may, to appearance, be quite as beautiful, thrifty, and make as heavy an animal when slaughtered, and perhaps heavier; but such swine are not the right ones to select as breeders. It is not the most beautiful animals that can be relied on as breeders; but the ones that will transmit the greatest number of excellent points of desirable form and symmetry to the progeny. Blood will tell. Like will produce like to a certain extent.—Independent.

Scientific.

THE MICROSCOPE'S TESTIMONY.

It is not till we descend to the minuter organisms that we gain even a feeble conception of the Divine skill. If one were to give much attention to an insect so common and so slightly regarded as the house fly most people would look down upon him as wholly given over to frivolity. But there is no part of nature unworthy of notice; and a naturalist, studying the structure of a creature so little exalted as the domestic fly, has soon ample reason for feeling himself face to face with the all-present God. To economize space, we confine ourselves to the eye. Multitudes of insects have two kinds of eyes, the one kind simple, and constituting small elevated shining black specks on the top of the head; the other sort, two in number, just where we should expect to find them, and composite in structure. Boys sometimes purchase or receive as a present a bit of cut glass, so shaped as to have a multitude of facets. When this is put to the eye, every facet presents a highly-colored image, and the general effect of the whole is in no slight degree beautiful. When God would construct the apparatus of vision for a fly, He adopted a similar principle: He cut a lens, if it may be so worded, into no fewer than 4,000 distinct facets; and, as in case of honey-combs, that He might economize space, He made each of them a hexagon, that mathematical figure being capable of filling an area without leaving any interstices. How utterly would it be beyond the power of the most skillful workman successfully to place 4,000 facets side by side within the minute space occupied by the eyes of a domestic fly! Yet this has been done by the Creator. Nay, He has effected even more than this. A facet of an insect's eye is, after all, nothing more than an optical instrument, capable of informing the little animal possessing it of what is passing within that portion of the landscape which it sweeps. But, in order that this intelligence may be transmitted, it is needful that a nerve connect the instrument with the brain of the insect. As might have been expected, the infinitely wise Worker has made provision to meet this necessity; for, virtually speaking, 4,000 telegraph-wires connect the several optical instruments with the brain, thus transmitting intelligence from the spot where it first became known to the central office. How vast beyond all finite conception the wisdom and the power that have been brought into requisition for the benefit of tiny existences, on which most persons do not condescend to bestow a single thought! The microscope sets limits to our admiration for man's mechanical skill. Let it be turned, for example, on a fragment of the smoothest paper, and the object will appear covered with coarse felt, like a white hat. Let it next be directed towards any work of God—we care not which it be—and, instead of old beauties vanishing, a crowd of new beauties will appear.

As in prosecuting the inquiry, we descend to a lower platform in the pyramid of animated beings, the transcendent greatness of the Divine architect of nature increasingly shines forth. Nowhere is it more manifest than when investigation is made respecting the animalcule, called infusoria, from their being found occasionally in various infusions. Here again we note the great variety of forms which it has pleased Him, who does all things well, to bring into being. Triangles, cylinders girded round with rows of rings, wheels, spherical bodies like globes mounted, rectangles so connected as to make a series of zig-zags, and other forms too numerous to describe, illustrate the variety to be met with in this neglected portion of nature. Some animalcules are known of a size so minute, that a million of them would do no more than occupy the space covered by a grain of sand! Yet is each one of these inconceivably minute creatures possessed of organs perfectly adapted to its mode of life! "Thou thoughtest that I was altogether such an one as thyself," was a charge brought by the All Holy God against some of the morally depraved in the Jewish Church. If any persons are in danger of supposing that the great discoveries of modern science have perceptibly diminished the distance between man and his Maker, and are inclined to think God not infinitely exalted in all-formative skill above the most gifted of his creatures, a study of facts like those now mentioned will dispel such an illusion. The scientific triumphs of our age have undeniably been great, but just as the diameter of the earth's orbit dwindles into a mathematical point, when astronomers try to use it as a base line, whence to calculate the distances of the fixed stars, so the intellect and skill of the most highly gifted mortal are diminished to nothingness, and disappear when viewed side by side with the similar attributes of God revealed in the Creation.

It is related of a great man that when dying he expressed his regret that he had seen so little of this beautiful world. It was a perfectly legitimate source of grief

But even had he travelled far, and visited many countries, he might still have made the same lamentation when life began to draw to a close. For how little of this beautiful world can any see during the brief limits within which human life is confined! Not merely is the globe too vast for us to traverse it in every part, but the minutest speck of organic or even of inorganic matter has in it secrets to disclose, had we only the time and ability to interrogate it aright. In reflecting on these matters, we feel ourselves driven to the thought, which meets us at every turn, that human life is far too brief to permit of our here doing anything effective to understand the works and the ways of God. As we sit sadly musing, an exceeding longing for immortality comes over our spirits, and we increasingly appreciate the glorious gift of an eternal and happy residence above, purchased by Christ for those who seek salvation through His blood.—Robert Hunter in Sunday Magazine.

THE COAL SUPPLY OF THE WORLD.

The question started some time since as to the length of time our coal was likely to last has led to inquiries by our Government, as to the coal-supply of other countries, and the result must be very reassuring to those (if there be any such) who fear that the world will be short of coals some three or four thousand years hence. The information appears in the form of a blue-book, containing reports which have been received from secretaries to various British Embassies and Legations respecting the prospects of a supply of coal, if need be, from abroad. The return includes reports from Austria, Baden, Bavaria, Belgium, Brazil, France, Prussia, Russia, Spain, the United States, and the Zollverein. France, in 1865, produced 11,297,052 tons, and imported, 7,108,286 tons, of which, 1,455,206 tons were imported from Great Britain. Every year shows an increase of coal consumption in that country. Prussia is rich in mineral fuel, especially in very good coals. The working of the coal pits is rapidly and continuously increasing. No coal is exported from Russia, which is supplied in a great degree from other countries, prominently Great Britain. During 1863, the latest date from which statistics are supplied, the coal produce of Spain amounted to 401,297 tons. No coal is exported from that kingdom. Austria, Bavaria, Belgium, and other continental countries all seem to have well stocked coal-cellars to fall back upon.

In the year ending June 30th, 1866, the produce of the United States was 20,553,550 tons, being an increase of 3,447,049 tons as compared with the previous year. It has been estimated that the capacity of the Pennsylvania mines alone is fully equal to 20,000,000 tons a year. In nine counties of the State of Missouri there are about 3,500 miles of coal lands, which average a mean thickness of 11 feet. Professor Sealow's computation makes out 38,000,000,000 tons of coal in these nine counties alone. In 40 counties of the same State there is said to be sufficient coal to last 3,000 years of 300 working days each, if an average of 100,000 tons were mined every day. Professor Rogers has estimated that the Illinois coal fields are six times as extensive as those of Great Britain, and that it would take 100,000 years to exhaust them. South America, too, has abundance of coal.

British Columbia, Falkland Islands, Mauritius, Newfoundland, New South Wales, and New Zealand are all reported on in an Appendix. In none of these, however, is there coal in any quantity, with the exception of New South Wales, where this valuable mineral is described as abounding. The exports of coal from the colony are extensive, and are rapidly increasing. Coal, too, has been discovered in Natal, so that the notion prevalent among men of science in England that there is "not an inch of coal in Africa" requires qualification. The coal of Natal is of good quality and large quantity, forming a huge water-shed, draining a very large area into one natural outlet, the channel of the Tugela river. The coal occurs in seams over six feet thick, which alternate with beds of shale, and it may be seen running directly into the face of the hills. It is richly bituminous, burns readily, makes excellent fires, and cooks well. It is already in almost universal use among the blacksmiths of the colony. There are no engineering difficulties between the coal-field and the sea which would prevent the speedy construction of a railway, and the coal could thus be sold at the port for about £1 sterling per ton. Steam vessels of large burden could be made to perform profitable voyages of six and seven thousand miles, with a speed of twenty miles an hour; if they could obtain coal at this price, and Natal is less than 7,000 miles from England, and much less from India.

So much for the world's coal supply, and for our own position even were we to run short of coals at home.—Builder.

THE COMPANION STAR OF SIRIUS.

The grand discovery of the planet Neptune, by the calculations of Leverrier and Adams simultaneously proceeding seems almost to yield in its splendor to the discoveries more recently made in the neighborhood of that great landmark of astronomers, that "superb Star," whose light, which it takes twenty of our years to transmit to us, and whose glories it would take four hundred such suns as ours to kindle, has been for a long time one of the great landmarks of astronomic observation. Certain undulations of regular recurrence perceived in it, and which could not be ascribed to parallax, were by anticipation ascribed to the attraction of an "Unseen companion"; and, in January 1862, Mr. Alvan Clarke of New York, discovered in its neighborhood a minute star which had eluded all previous observation. Its real existence, has not been verified, and Sir John Herschel believes there is every reason to regard this as the unseen

companion, the presence of whose mild power awakened the mystic palpitations in the fiery element—at forty-seven times the distance of the sun from the earth, their calculations have fixed this dim and remote stranger.—Electric.

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