

IMPROVED TEN HORSE STEAM PLOWING ENGINE.

in any direction to suit the unevenness of the road. Messrs. Everitt, Adams & Co. inform us that they find in practice that this makes a marked difference in running, and that they have run the engine illustrated at the rate of eight miles an hour without any unpleasant motion on the footplate, and this on rough roads.—*Engineering.*

AUSTRALIAN SHEEP.

ONE of the most important articles of exportation of the Australian colonies is wool. Only a few quadrupeds are indigenous in that curious continent. All domestic animals were imported at the time of early settlement by English convicts. In 1789 the idea occurred to Captain McArthur, then commanding the military stationed at Botany Bay, that the sheep was, by its nature and habits, peculiarly adapted to the climate and other conditions existing in Australia. Without hesitation he procured ten ewes and three rams from the Cape of Good Hope, and later, ten ewes were received from Bengal, of a different race. A cross breed was

and the race was now again improved by crossing it with the imported animals. McArthur's flocks rapidly increased in number, and in 1823 the first Australian wool, ten bales, was sold in London for £88. Since that time the production has rapidly increased. At present 152,500,000 pounds of wool are annually exported, representing a value of £11,650,000.

There are over thirty millions of sheep in Australia, divided as follows:

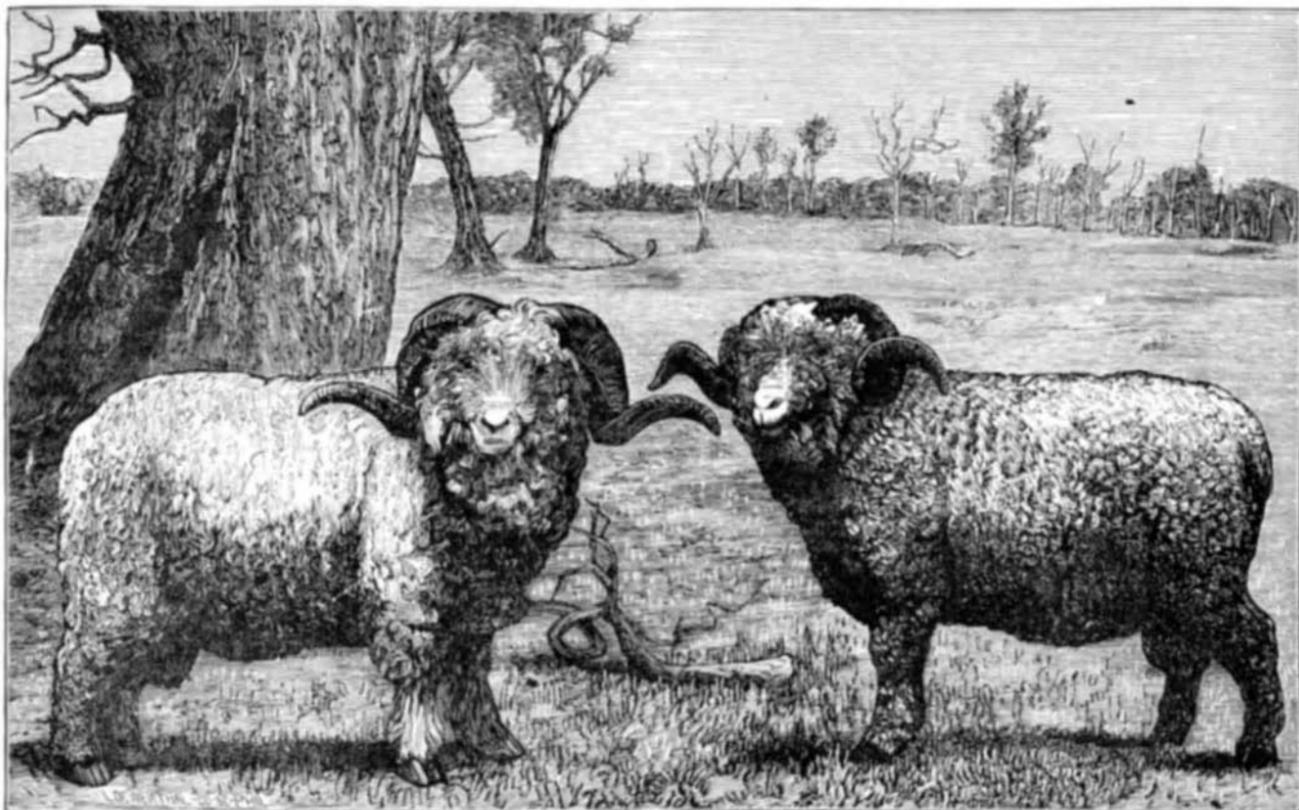
New South Wales.....	8,000,000
Victoria.....	9,000,000
Tasmania.....	1,500,000
South Australia.....	6,000,000
Queensland.....	6,000,000

These numbers are probably stated too low, as since the last census several years have passed, during which several millions have been added to the stock.

The sheep are a hardy and vigorous race, and their general appearance is well represented in our engraving.

all have honey enough for their use during the winter and spring, until flowers open again, and this should not be less than twenty-five pounds, and thirty would be better. If we wish to feed in the spring, twenty will do. To ascertain the amount of honey, lift the frames from the hive and count off the number of pounds, or weigh a hive containing empty combs, and add five pounds to it for pollen and bees; then have your bees all weigh from twenty-five to thirty pounds more than this. There probably is no better way to winter bees than to put them in a good underground cellar. Still, we prefer to winter about one-half in the cellar and one-half out on their summer stands, so as to be sure of being right somewhere, like the farmer who puts in a variety of crops, as all are not likely to fail the same season. Some years bees winter best in cellars, and again out-doors. To this end we built a cellar to hold about one hundred colonies in a bank close by, and have had good success therein. The mercury in it has not been above 46°, nor below 41°, since we built it, during the time the bees were in it.

Bees should be put in the cellar during the first half of



TYPE OF AUSTRALIAN SHEEP

the result; the animals were very rich in wool, and the latter of excellent quality. McArthur's means were, however, limited, and, convinced that the production of wool would ultimately become the principal source of wealth in the colonies, he went to England to obtain aid from the government. The latter did not receive the project with much favor, however, and in parliament McArthur was ridiculed. Lord Camden alone made an exception, and induced the government to present McArthur with a number of males and females selected from the royal flocks at Kew. Thrown thus upon his own resources, McArthur bought up four hundred sheep of the best Saxon blood and left with them for Sydney. Few of the animals died during the voyage; the rest arrived in excellent condition. The descendants of the Cape Bengalese cross breed had meanwhile multiplied,

The quality of Australian wool is well and favorably known all over the world.

PREPARING BEES FOR WINTER.

MR. G. M. DOOLITTLE, Borodino, N. Y., writes as follows in the *American Bee Journal*:

Having our honey all disposed of and our nuclei united, we are ready this month to fix our bees for winter. In some localities, where fall flowers are abundant, it may be well enough to defer getting the bees ready for winter till next month, but with us we rarely ever get any honey after the 10th of September. We consider that the earlier bees are prepared for winter, after honey-gathering is over, the better they will winter. The first thing to be done is to see that

November, and when the hives are dry and free from frost, if we wish them to winter well, for we cannot expect them to winter well if they are made damp from any cause whatsoever. Carry them in so as to disturb them as little as possible, and after they are in, leave them as quiet as you can until the pollen is plenty in the spring. Those on summer stands have all the boxes removed and the places used for the side boxes packed with chaff or fine straw. It should be well pressed in so as to fill into all the corners. Fill the caps also and press it in thoroughly, or use chaff cushions if you have them; yet I hardly think them enough; better to pay for the cost in making them. During winter keep the snow away from them so the cap is always in sight. After our experience of last winter, we believe that bees should not remain out of sight in snow for a great length of

time. Give them a chance to fly every time it is warm enough, remembering that a bee can get off melting snow as easily as anything else, providing it is warm enough to raise the mercury to 45° in the shade with it still and the sun shining; otherwise the mercury should mark 50° or above.

As to the safety of wintering we would say that if the bees have a chance to fly once in five or six weeks they will usually winter well; while if they have to contain their feces for four or five months there will be great mortality throughout the country. This constant eating with no chance to void the feces for five months in succession, during a cold winter on the summer stands, seems to destroy the vitality of the bees, and makes spring dwindling a necessity. Some feel disposed to call this a disease, or the dysentery, but we can hardly see things in that light.

EAST INDIAN WHEAT.

As regards wheat, India may shortly become one of the chief sources of supply for the United Kingdom. It must be borne in mind that India is one of the largest wheat-producing countries in the world. The production of the United Kingdom amounts to only about 10,000,000 to 13,000,000 quarters per annum. Austria-Hungary, Italy, and Spain each produce about the same quantity. Germany produces from 15,000,000 to 18,000,000 quarters, and the two countries which produce the largest amounts are France and Russia, each producing from 30,000,000 to 35,000,000 quarters per annum. Both are surpassed by the United States, which produced during each of the past two years upwards of 45,000,000 quarters. No complete statistics exist for India, but we know that the Punjab alone produces about as much as the United Kingdom, Oude about 3,500,000 quarters, the Central Provinces about 3,000,000, and Bombay not much less. The production in the Northwest Provinces proper has never been estimated, but must be fully equal to that of the Punjab, and that of Behar is also known to be considerable. Thus the yearly production of the provinces under British rule will amount to from 30,000,000 to 35,000,000 quarters, or to the same quantity as that produced by Russia or France. But of the native states in the Punjab, Rajpootana, Malwa, Bundelkund, and Guzerat, be added, in all of which wheat is largely cultivated, it will be found that India must be considered as being, next to the United States, the largest wheat-producing country in the world.

Whilst as regards cotton and some other produce, the soil and climate of India are rather at a disadvantage with those of other competing countries, as regards wheat India is proved to be admirably adapted for the production of the finest qualities of both soft and hard wheat. This is a circumstance of great importance, because the supply of the fine varieties is much more restricted than that of the commoner kinds. In considering the competition in the markets of the world, France, although producing as much as Russia, may be left out of account, as its production, large though it may be, barely suffices for its own consumption. Thus, practically, Russia and the United States are the chief competing countries to be considered. But in both countries the area for production of fine full-grown wheat is comparatively restricted. Spring wheat forms a very large proportion of the Russian supply, as the greater part of the country is too cold for the growth of winter wheat; in the United States, likewise, the climate of Minnesota, Iowa, and the other States on the Canadian border, in which the cultivation of wheat has been recently so rapidly extending, is only adapted for the growth of spring wheat. This wheat, which is mostly red, is not only inferior in quality to a good winter wheat, but it produces also a much lighter crop, not more than 12 to 15 bushels per acre. Thus, however much the cultivation may extend in these parts, it is not likely to affect the supply of the finest varieties, such as are grown in some of the older States or in California.

The true policy for India, therefore, appears to consist in taking advantage of her climatic position, and cultivating for export only the finest varieties, in which the competition of Russia and the far West in America is not likely to be as severe as in the case of the common varieties. Such a policy receives additional recommendation from the fact that the price of the finer varieties is always better kept up, and suffers less in a falling market than that of the common wheat. The higher priced wheat will likewise support better the necessarily high charges of transport and freight.—*Dr. J. Forbes Watson, in the Journal of Applied Science.*

THE PITURI PLANT.

A GOOD deal of interest has lately been attached to a singular plant of Queensland and South Australia, known to the people as the pituri, or, as it has been popularly spelt, pitcher, pitchour, or even billgery. This plant is known to botanists as *Duboisia* or *Anthocercis Hopwoodii*, and belongs to the natural order Scrophulariaceae. The leaves, it is said, are gathered annually during the month of August, when the plant is in blossom. They are dried, first by a process of straining, and then packing them in hemp bags for purposes of trade. To prepare pituri for use it is damped, mixed with ashes, and rolled up into the shape of a cigar, which the people chew, sticking it during the intervals of chewing behind the ear. The effect of the smoking of this novel cigar is very peculiar, rendering the smoker, for the time being, almost insane when indulged in too freely. When smoked in moderation the leaves have a powerful stimulating effect, but the symptoms are somewhat similar to those produced by strong drink when taken to excess. The chewing of a small quantity of the leaves is said to assuage hunger, and a person so using them is enabled to undertake long journeys without fatigue and with little food.

THE NEWER GRAPES.

At the recent meeting of the American Pomological Society, Rochester, N. Y., the discussion of the merits of the newer sorts of grapes occupied a considerable portion of the session. Moore's Early was pronounced by W. C. Strong, of Boston, the only new sort at that place that he regards as really valuable. The Rogers' Seedlings evidently succeed better in western New York than in Massachusetts, judging from the fine specimens seen on the tables, and hence the superiority of Moore's to any of them at Boston. Moore's is entirely hardy, and was stated by Robert Manning, of Boston, to be two weeks earlier than Hartford. J. W. Manning, of Massachusetts, confirmed R. Manning's statement as to earliness, and added that it is a strong grower and entirely free from mildew, although the Concord often mildews alongside. T. C. Maxwell, of Geneva, regarded Moore's as quite poor in quality, and he did not see what any man wanted with such grapes; it is quite inferior to Worden and

other sorts. J. Saul, of Washington, D. C., said Moore's is a fine showy grape, but decidedly inferior in quality, but its early ripening gives it an advantage at the North. Mr. Strong said its great value at Boston consists in its perfect ripening there, where other sorts, doing well in New York, fail. T. S. Hubbard, of Fredonia, N. Y., said the Moore is far inferior to the Concord in quality. G. W. Campbell, of Ohio, has found it this year a week earlier than Concord, and about equal to it in quality. Other seasons might vary this result. Thos. Meehan, of Pennsylvania, thought young vines generally ripen fruit later than old ones. A. C. Younglove said the grapes on young Delaware vines ripen sooner than on older ones, but this is not the case with the Rogers sorts, and that the rule varies with varieties.

S. D. Willard, of Geneva, said that the Worden generally matures two weeks before the Concord, that the berries never drop, and that his vines bear as well or better than the Concord. Mr. Moody, on the contrary, has seen it in several localities, and he regards them identical. W. C. Strong, of Boston, thought it not so good as Concord, although two weeks earlier. [There is no doubt that the Concord has been sometimes sold as Worden, and that in different years and in different soils and localities, the times of ripening will greatly vary, and one sort may be earlier than another this year and later next, and a series of observations is necessary.] G. W. Campbell, of Ohio, has found the Worden to ripen one week before the Concord; it is larger in size and more juicy—in other respects resembles the Concord. T. S. Hubbard, of Fredonia, found the two so much alike, and ripening so nearly at the same time, that he does not need both.

E. Moody, of Lockport, recommended the Niagara as one of the most promising new varieties. He had examined it for several years; it ripens before the Concord; is a very strong grower, holding its leaves long, and the variety is valuable in every respect. J. Crane, of the same place, indorsed this character, and stated that it is a cross between Cassady and Concord. A. C. Younglove, of Hammondsport, spoke highly of its value, and Mr. Hubbard said it is a week earlier than Concord, and a more vigorous grower. The Brighton grape was spoken of highly by several members, being strong, hardy, and healthy in growth, succeeding quite as well as any of Rogers', but one speaker thought the latter a very moderate recommendation, and its growth is not always perfectly healthy.

T. S. Hubbard said the Prentiss has now been fruited ten years, and has continued to gain in character. The vine has proved a good grower, not quite so vigorous as the Concord, but equal to the Diana; it is not affected with leaf blight, with very slight exceptions, but is as free from it as any native except Concord; the cluster is compact, the berries medium in size, greenish white, of excellent quality. It ripens with the Concord. The Lady Washington, one of Mr. Ricketts' seedlings, one-quarter exotic, has fruited only at Newburg. C. A. Green, of Ontario County, has found it a vigorous grower, and others have observed on it a slight degree of mildew. The Pocklington was stated by P. Barry to be a large, handsome grape, rather lacking in quality. A. C. Younglove said its clusters are large and the berries of large size.

CULTIVATION AND DISEASES.

Dr. Hamilton, of Nova Scotia, was here invited to offer some general remarks on grape culture as applicable to that cool region of country. He has grown successfully side by side, by girdling, the Salem, Concord, Isabella, Diana, Delaware, Black Cluster, and Sweetwater. Close pruning is also essential. These sorts do not ripen well in all years. He has found girdled grapes of fine flavor in Nova Scotia, and on being tested along with the same sorts grown in Michigan, the former are pronounced best. He has found a material difference between Worden and Concord. The Black Hamburg in open air, by girdling and close pruning, has produced specimens nearly or quite ripe every year.

The Lady grape was stated by G. W. Campbell, its originator, to be a pure Concord seedling, white, and two weeks earlier than its parent. J. Saul, of Washington, D. C., has found it equally early and of very good quality. A member from Connecticut said it is the best white grape in that State. T. S. Hubbard, of Fredonia, confirmed this statement of its early ripening, and added that the skin is very tender, rendering it liable to crack, and adapted only for home use and near market. Mr. Campbell added that it has large and very strong roots, and the older vines are as vigorous as those of the Concord. D. W. Beadle, of Canada, inquired if there are two distinct varieties known as Champion. Mr. Campbell said there are a southern and a northern variety of this name; and Mr. Hubbard added that only one sort is known at the North, the southern variety never having found its way here. The northern variety, known as Champion and Tallman, has been renamed Beaconsfield, and sold at high prices in Canada to the ignorant.

Isidor Bush, of Missouri, on invitation, gave an account of the best varieties of the grape for that region. The grape growers there have been compelled to reject most of the sorts originating from the species *Labrusca*, and confine themselves to the indigenous species (*V. riparia*) for the production of successful varieties, for the prevention of rot. Among the best is the Elvira, a grape of great merit, the only defect being too compact a bunch. The Noah is an excellent sort, not so compact, white, transparent. G. W. Campbell has seen the Noah, and found it larger and handsomer than the Elvira, with a purer and better quality, and it does not crack.

Wm. Saunders, of Washington, D. C., read a valuable paper on the cultivation of the grape, containing practical suggestions, and among others on the importance of protecting the trellis against dew and radiation above by a coping or broad board placed lengthwise horizontally. Mr. Bush, of Missouri, read a paper on grape rot. He said rot and mildew are entirely distinct; that we do not now know much more about rot than eighteen years ago; wet and sultry weather accompanies it. He thought that Mr. Saunders' coping, if broad and extensive enough, would be useful, but it would be found impracticable in large vineyards. The Catawba is the first to suffer; the Concord has been recommended as proof against it, but in some places it had been fatally attacked. The disease is a fungus under the epidermis, not reached by sulphur, carbolic acid, or sulphite of lime. Paper bags have been used with some promise of success, but they need farther trial. Vigor of growth in the vine is not proof against it; soil does not affect it, and in proof of this Mr. B. said that some vineyards within the past four years have been destroyed, alike on hillsides and in valleys. He looks for some new remedy, but more especially for new varieties from the native species, and he hopes for a return of more favorable seasons. He stated that wet weather has not influenced it, that this year it began early in summer during a great drought, and after the rains came

it ceased. But we know very little about it, and he left it open for further investigation.

Mr. M. B. Bateham, of Ohio, exhibited bunches of Iona, Catawba, and other sorts, badly affected and ruined by rot. He said it varies in the time and mode of attack; sometimes while the berries are small, and at others when nearly grown; rarely after the seeds begin to harden. There are 10,000 acres of vineyard in Ohio, one-half of which lie along the lake shore, and the other half in small plantations through the interior of the State. Along the shore and on the islands they are nearly exempt from the dampness of dew, and most of these escaped rot. Thousands of acres of vines inland have been grubbed up on account of the disease. He asked the American Pomological Society for relief. He thought the disease is caused by rapid growth in early summer, and then a check by close, damp, sultry air, which tends to develop the parasitic fungus—its immediate cause. He has known a streak of such weather to carry a streak of rot through two or three counties. He recommended as a remedy, keeping the roots dry and preventing succulent growth. On a naturally dry soil with natural drainage there has been little rot; on low land, even if well underdrained, it has prevailed. The advantage of the coping mentioned by Mr. Saunders, he regarded as owing to the warding off of the dampness of dew and rain.

N. J. Colman, of St. Louis, said his experience conflicts with that of Mr. Bateham. He can always obtain four or five good crops of grapes from young vines, while old ones lose all their fruit. Hence the remedy is in repeated plantings every few years. It cannot be weather. G. W. Campbell said the Delaware does not rot, and he therefore recommended raising seedlings from the Delaware. Mr. Bush said the Delaware is so subject to mildew that it cannot get a chance to rot. Dr. Warder urged the importance of looking to other varieties than those from the *Labrusca*, as recommended by Mr. Bush. Mr. Bateham said the reason old vines are most affected, is because the germs of the fungus gradually take possession as they become older. Mr. Saunders said that by using a self-regulating thermometer, he found the temperature under the coping 8° higher than elsewhere, and the grapes if exposed were chilled and injured. Mr. Strong said that vines kept warm by training over rocks escape. Dr. Hamilton said they rarely have rot or mildew in Nova Scotia. Dr. Warder said that the conclusion reached by cultivators in Ohio in relation to the identity of the two diseases, is that the same fungus causes both, in different stages of growth. But G. W. Campbell did not know how to reconcile this with the fact that the Delaware never rots, but often mildews. Dr. Warder said that in all the discussions on these diseases, they have always come to one uniform conclusion, namely: "We do not know."

THE EXHIBITION AT ROCHESTER.

The western section of the Empire State is pre-eminently noted for its fruits and flowers, and a few of the purely horticultural features of the recent exhibition at Rochester are worthy of especial note. To begin with the fruits, which were so capably brought to the front—apples and pears were no doubt by far the most important exhibit; but to me, at least, they would have been infinitely more interesting had some little pains been bestowed upon classification. This seems to be utterly neglected, and form, color, quality, and season are almost invariably mixed up in inextricable confusion; nor are the labels attached in the best possible manner, or in the most readable condition. I think the judges would do well to make it a point, wherever two collections approach each other in merit, to award the premium where most attention is given to these very essential features.

Marshall P. Wilder, of Boston, showed a splendidly finished collection of pears, containing 126 varieties; but in fruits of all kinds, Messrs. Ellwanger & Barry fully sustained their well-earned reputation. They showed some 35 varieties of plums; apples and pears in abundance and excellent condition; and grapes in some 6 dozen varieties. Their collection of these latter was singularly fine, embracing many of the showy Rogers' hybrids and others of like character. Among reds the most striking in appearance were Gaertner, Agawam, and Salem. In black grapes, splendid in bunch, berry, and finish, were Concord, Wilder, Merrimack, Barry, Herbert, Rogers' 36, Creveling, and the Brighton—a grape of a deep red rather than black, large in the bunch and berry as a Hamburg, and excellent in flavor. Grapes with the appearance of the Grizzly Frontignan were represented by the Goethe, a beautiful grape in the berry, rather irregular in the bunch, of exquisite flavor for an American grape, but requiring a south wall to bring it to full ripeness and perfection north of Baltimore. The Diana is another good looking and well known grape, of much the same color as the Goethe. White grapes were not so well represented by this firm as by other parties, their best being Rebecca and Martha.

Much attention seems to have been bestowed on the raising of a first-class white grape, and there were three new ones competing for public favor at this show. I shall try to tell you just what I think of them, and I can do so freely, for I know none of the parties interested in them. The Pocklington was the largest grape both in bunch and berry, but it was not fully ripe, and in that state it was decidedly "foxy." A fine grape exhibited for the first time this fall, and named "Niagara," is a very promising grape indeed. It was originated in 1872, and is said to be a cross between Concord and Cassady. Well exposed bunches are almost as beautiful in appearance as the Royal Muscadine; the skin is tough, and it is said to be hardy, and a good bearer, but it is not by any means destitute of the "foxy" flavor so much admired by many. A smaller grape, tougher in the skin, but better perhaps in flavor than either of the preceding, is the Prentiss; it is of the size both in bunch and berry of the average Concord. Mr. Ricketts, of Newburg, had several fine seedlings of the size and appearance of the Rogers' hybrids. Lady Washington is a grape among these of a fine appearance and reputed good qualities. Any one wanting a selection of hardy grapes of splendid appearance cannot be wrong in planting and giving a trial to any or all of the above. They represent the century of progress in American grape culture, and if I were planting to-morrow, I should confine myself to the foregoing list, and perhaps weed out half of them after farther trial in any given locality.—*Country Gentleman.*

CERESIN, a mixture of refined earth-wax and carabanbawax, is frequently employed to the extent of 33 to 50 per cent. to adulterate bees-wax. As pure bees-wax is lighter than the spurious article, detection is easy. If the wax does not float in dilute alcohol having a specific gravity of 0.745, it is safe to reject it as spurious.