

The judges began at the bottom by ordering those that were not in it out of the ring, finally narrowing it down to three pair: Featherston's Yorks, a fine, even pair of long, deep-sided, bacon pigs; George & Son's Tamworths, also a typical pair of bacon curer's pigs, and a pair of cross-breeds (Tamworth, Berkshire) shown by Geo. North, Marden. They were finally placed in order named. A protest was, however, entered, claiming that these pigs were over weight. This proved to be the case with the first and second pairs, and after considerable cross-firing, the Directors ordered Dr. J. Y. Ormsby into the ring to settle the matter, and he placed Geo. North's cross-breeds first, with a pair of Yorkshires shown by J. E. Brethour second. The first-prize pair were model packer's pigs, lacking, perhaps, in hams, but good and even there.

Now, "after the ball is over," and one can calmly look back over all the different breeds represented in the various classes, we come to the conclusion that all the large breeds are coming to much the one type: The Berkshires, Poland-Chinas, Chester Whites are being lengthened out, and the Yorkshires shortened, brought near the ground, and made finer, all aiming to give the packer the type he desires for export bacon, modified so as to be a profitable feeding pig for the farmer.

QUESTIONS AND ANSWERS.

[In order to make this department as useful as possible, parties enclosing stamped envelopes will receive answers by mail, in cases where early replies appear to us advisable; all enquiries, when of general interest, will be published in next succeeding issue, if received at this office in sufficient time. Enquiries must in all cases attach their name and address in full, though not necessarily for publication.]

Miscellaneous.

SELF-SUCKING COW.

E. C. T.:—"1. I have had the misfortune to buy a pure-bred Jersey cow that sucks herself whenever the teats become filled. How can she be cured of her habit?"

2. I had no guarantee from the person from whom I bought her that she did not suck herself. Could I recover damages or price of cow in a court of law?"

[1. A cow that acquires the troublesome habit of milking herself, seldom, if ever, is cured without keeping her tied with a halter so that she cannot reach her udder, and by applying a fixture of some sort when she is turned out. We gave in our June 1st issue, 1893, a cut and description of a contrivance to prevent a cow from sucking herself. It is this: Take two pieces of good wood, one and a-half by two inches, two feet six inches long, and two pieces one and a-half by two, one foot six inches long, and bolt them together in the form of a square poke, with the ends of the cross-pieces projecting about a foot on either side of her neck, each piece having a sharp spike, one inch long, projecting from the back side about one inch from the end, so that when the cow turns her head to suck, the spike will catch her in the shoulder, which will soon teach her to leave the milk for the milkmaid. The appliance should fit close to the neck, so that the cow cannot get her head out. It may be removed by taking out the bolts on one side. Another method is to cover the udder with a canvas bag, held in position by two ropes which pass over the loin, one in front and the other behind the leg, and fastened to a strap which passes forward to a surcingle firmly buckled around just back of the forelegs. 2. No.]

TEACHER'S CERTIFICATES IN MANITOBA AND MICHIGAN.

FRED. THORNTON, Ingersoll, Ont.:—"I take pleasure in reading your 'Questions and Answers,' and I think this phase of your paper is very useful. Here are some questions which you may answer in your next issue of the ADVOCATE: 1. What is necessary for a teacher holding a third-class professional and a second-class non-professional certificate here, to do in order to be a teacher qualified for Manitoba? Are third-class teachers allowed to teach in Manitoba? 2. Would it be necessary for a teacher going from here to Michigan, to pass an examination there? If so, what would be the nature of the examination, and how long would one have to go to school there in order to pass it?"

[1. On the strength of your Ontario certificates, the Manitoban Inspector in whose district you sought a school, might give you a permit until the July examinations. 2. Yes. 3. After studying U. S. history, the holder of an Ontario certificate has usually no difficulty in passing the examination in Michigan.]

RAPE FOR SHEEP.

JAS. A. MARTIN, St. Williams:—"I would like to ask for information regarding rape for sheep food: When it should be sown? When and what stage of its growth should it be pastured? I think of using it to supplement early fall pasture."

[Rape should be sown in Ontario from June 20th to July 5th. It should not be fed till fairly well grown, say about Sept. 1st, or later, according to the season. In our Sept. 1st issue appeared an article on feeding rape, to which Mr. Martin would do well to refer.]

FARM.

Popular Geology—No. 8.

BY PROF. J. H. PANTON, M. A., F. G. S.

Silurian System.—This name is derived from the word Silures, the name of an ancient tribe of Britons, who lived in the west of England, where the rocks of this period were first studied.

Nature.—These rocks are chiefly dolomitic limestone (a combination of lime and magnesia, with carbonic acid), but in some places a soft, red sandstone appears.

Locality.—The area over which the G. T. R. passes from Weston to Baden, in Ontario, embraces this system.

Life.—Fossils are innumerable in deposits of this system. Shells are so common it is known as the "Age of Mollusks." Many remains of seaweed occur; a very characteristic one (*Arthropycus*) is found in rocks near Grimsby. A fossil land-plant has been found; corals also abound. In Europe remains of fish have been found at the summit of Silurian rocks. In 1888 remains of fish were discovered in these rocks in New Brunswick.

The Silurian species have been estimated as 718 corals, 1,579 trilobites, 1,086 bivalve shells, 1,306 univalves, and 40 fishes.

Economic Products.—Salt (Goderich), gypsum (Paris), building stone (Forks of the Credit), Dolomite for building purposes and the manufacture of lime (Guelph), lithographic stone (near Walkerton).

The deposits containing gypsum and salt are supposed to have originated partly in salt lakes or inlets of the sea while rapid evaporation was taking place, and some account for them by a simple chemical union of the elements of which they are composed. It was likely a time of elevation, and dry climate, with deserts and salt lakes. The Silurian period was one of shallow seas. Life largely in the seas, and warm climate. Silence was a leading feature of that time, for there were no animals as yet capable of making a sound, and no forests, as plant life was confined to the sea. The only break to the silence was the sound of nameless seas, and the rush of the wind over bare rocks. The Green Mountains made their appearance at the close of this period.

Devonian Period.—This name is derived from Devon, in England. Some have given the name Erian to this system on account of the great area of these deposits found about Lake Erie. This is the old red sandstone of Scotland.

Nature.—Sandstone is common among the deposits in Scotland, but in Ontario they are chiefly limestone and clay beds, with some sandstone.

Locality.—The area included between Baden, on the G. T. R., and Sarnia lies within this system. With this period the geology of Ontario ended until the fifteenth (Pleistocene) was reached, when this Province received another donation. During the vast period of time including seven systems, Ontario was at a geological standstill as far as receiving further deposits. It is likely the rocks were above the sea, and so not in a position to receive additions to the beds already formed.

Life.—The advance of both plant or animal life is very marked. Land plants are common in the form of ferns, and trees similar to pines. They indicate the presence of forests. Fish are so plentiful that this has been termed the "Age of Fishes." These fishes were a peculiar type called ganoids; the skeleton was cartilaginous, and hence boneless; the body was covered with plates, or firm scales, and the tail was unequally lobed. They were wonderful in variety, size, and number, and were prepared to attack or defend themselves against their enemies. The *Dinichthys* was a huge form, whose remains have been found in Ohio. The head was three feet in length, and its body as great in diameter, and the length of the creature was fully thirty feet. Supplied with tusks one foot long, it became a terrible engine of destruction in the nameless seas of Devonian times.

It was among the fossils of the old red sandstone that Hugh Miller labored with such distinguished success, and in writing of them became famous for his descriptive powers.

Corals were very abundant. Seventy-five species are reported in the rocks along the shores of Lake Erie. Insect remains have been found.

Economic Products.—While a certain amount of limestone is obtained from these rocks, the great product is petroleum, its source being in the corniferous formation of this system. Regarding the origin of this valuable product, two explanations have been advanced. A. The distillation of bituminous coal. B. The decomposition of organic matter, chiefly vegetable. The oil is usually found in a porous dolomite limestone, a few feet in thickness, and comparatively soft. Two well-known fields exist in Ontario—Petrolia and Oil Springs—with about 2,500 wells from which petroleum is being obtained. All petroleum is not derived from Devonian rocks. The Canadian is gotten from lower Devonian (Corniferous). The wells of Kentucky and Pennsylvania are from the upper Devonian; those of Virginia are from sub-carboniferous, and those of Ohio are from the lower coal measure.

Secretary John Hall, Rochester, N. Y., writes us that the 40th annual meeting of that progressive organization, The Western New York Horticultural Society, will be held at Rochester on January 23rd and 24th, 1905.

British Columbia.

(Continued from page 191.)

Of the many fertile localities in this Province, probably that of Chilliwack is justly considered one of the best. In consequence of the uncommonly high water last spring, many early planted crops were destroyed. The wonderful fertility of the soil and other favorable conditions soon almost obliterated the appearance as well as the effect of the losses sustained, and fine fields of fodder, splendid vegetables and roots were grown as a result of a second planting. At the Fair of the Chilliwack Agricultural Association, held on October 16, 17 and 18, a special prize was offered for a collection of vegetables grown after the water receded, which were far superior to such exhibits in many places, under normal conditions. The exhibition at this place, as a whole, showed that the people of the locality could accomplish a great deal under most unfavorable circumstances, and many of the exhibits reflected credit on the producers, as well as being a practical demonstration in favor of the locality. Fruit is grown to perfection, and to such an extent that that sent to other parts of the country is becoming well and favorably known. The ease of access to market, luxuriant growth of cultivated crops, plentiful supply of pure water and favorable climate, renders this a most desirable place for dairying. Adjacent to this district is Agassiz, where is located the Government Experimental Farm, under the efficient superintendence of Mr. Thomas A. Sharp. That an important work is being done here is very evident. The experiments made in all branches of agriculture at this farm seem to be highly appreciated by a great many of the principal agriculturists of the Province. This is as it should be. Every fruit grower will understand that no spot can be found where all varieties of fruit grow to their greatest perfection. The fact that British Columbia has such a varied climate makes it a necessity, to secure best results, to obtain as accurate knowledge as possible of adaptability of different varieties for the localities where they are to be grown. It is very unwise to plant all kinds promiscuously. While almost all kinds may be successfully grown in the Province, the highest degree of success in every instance will be had by selecting special varieties for special conditions. This knowledge is only to be obtained by much careful study and experiment, and the advantages to be gained through the work being done along this line at the farm are great indeed. To go into detailed accounts of the hybridizing of different cereals, already done here, would occupy too much space, but we shall endeavor to mention, from time to time, the more important. Of winter wheats tested last year, we might mention that "Canadian Velvet Chaff" stood head and shoulders above all others. The heads were the largest we remember ever having seen. One of the most novel results of the work coming under our notice has been the production of a barley-wheat. The heads of this curiosity resemble that of barley, but on shelling, it presents a change—behold! you have wheat. Whether this new grain possesses such qualities as will recommend it to general favor or not, requires a little time to demonstrate.

(TO BE CONTINUED.)

Restoring Soil Fertility.

BY JAMES MILLER.

Manuring should be looked upon as something more than merely adding to the soil a certain amount of matter in which it is deficient. Some parts, for instance, are valuable, not so much on account of what they themselves add to the soil, but because they act upon matter already in the soil, and render it available for the use of plants. For instance, manure is largely composed of carbonaceous matters, and it was formerly supposed that the roots of plants were capable of taking up carbon from the soil, as well as through their leaves, but modern experimenters have exploded this idea, and have discovered that the plants derive their whole supply, or nearly so, through their leaves, in the form of carbonic acid. So that the sole use of the carbon contained in the manures is as an insorbent ingredient. It also keeps heavy soils loose and porous, in developing by its decay the carbonic acid, which is the best solvent known. It is this substance which sets loose the stores of potash, phosphorous and other mineral manures which the soil may contain, and therefore the great point in maintaining or restoring fertility to soils lies in the increase of carbonaceous material. In the different parts of Canada which have been longest cultivated, and the fertility of which has consequently diminished, the restoration is best brought about by growing grass and clover, especially the latter. Many have the idea that other cultivated crops give more food per acre than clover or grass; no doubt they do, but it is not quite so certain that they do this with corresponding advantages to the soil. In Canada, where grain is grown year after year on the same land, nothing of any account remains after the harvest; but, in the case of clover, even if the growth above ground be entirely removed, there yet remains several tons of roots, which must go towards the fertility of the soil. By growing grain the soil soon becomes impoverished; by growing clover it does not. A good crop of clover plowed under has about the same benefit as \$15 worth of manure to the acre. A crop of wheat, which yields 30 bushels to the acre, will carry off in the grain 33 lbs. of nitrogen; in the straw, 12 lbs., or 45 lbs.