

ture, light, humidity, and air currents. The soil factors are water, physical character, chemical character, nutriment, depth, temperature and air. The biotic factors are other plants and animals.

Temperature is of great importance since the various vital processes of plants take place only within definite limits of temperature, and most actively at a certain optimum (best) temperature. Temperature is also of very great indirect importance, since it has a most decided effect upon humidity. One point in connection with temperature which must be strongly emphasized is that the mean annual temperature has little effect upon plant-life, but it is the temperatures which prevail during the period of growth and reproduction which count.

Light plays an important part in many ways. Without light there would be no production of chlorophyll, consequently no making of food from the carbon dioxide of the air and water of the soil by plants, since their power to do so depends upon the action of light upon this green coloring matter. Commencing at a certain minimum intensity of light, which varies with the species, this manufacturing of food increases as the intensity of the light rises, until an optimum is reached. Light that is too strong is injurious in action. The development of plants depends upon the duration as well as the intensity of the light to which they are exposed. Direct light promotes the production of leaves and flowers. The vegetative shapes of plants are greatly influenced by the intensity and direction of the light. Of this forest trees furnish excellent examples. Light, in the first place, determines the shape of the individual tree. The duration of the life of the branches depends partly upon the intensity of the light. The shade cast by the younger branches retards the activity of the leaves of the older branches, and thus renders impossible the normal development of buds and ripening of wood. The branches die off, become brittle and break by reason of their weight or of storms. It is because of this suppression that the central parts of trees and shrubs have so few twigs. A spruce standing in the open is conical and bears branches from its summit to its base, whereas one standing in a dense forest has only a small green crown. Deciduous trees standing in the open have a full ovoid head, but when growing in dense wood have only a small crown with upwardly directed branches.

Atmospheric moisture, or humidity is an important factor, because the relative humidity controls the loss of water from the plant, and anything which is concerned with the amount of water in a plant is particularly vital to it.

Air currents or wind acts as a factor mainly by its evaporating power. It dries the soil and it dries the plants. In a calm atmosphere the air adjacent to plants becomes humid, so that transpiration (loss of water through the stomata, or pores, of the leaf) is checked. By even weak movements of the air that close to the plants is carried away, and fresh, less humid, portions of it come in contact with the plant. Even when the atmosphere is very humid, its uninterrupted renewal will lead to strong transpiration. The stronger the wind and the drier the air, the greater will be the drying action. The force of the wind is far less on the ground than at some distance above it, consequently short plants are much better protected from wind than tall ones. The danger arising from wind is increased when at the same time the soil is cold, thus reducing the activity of the roots. Wind, when long-continued and mainly from one direction, exercises a marked effect upon tree-growth. The trees are low in stature, the trunk is often bent away from the prevailing wind, the shoots are short, irregularly branched and interlaced, many shoots are killed on the windward side and the leaves are smaller than usual. While the mechanical effect of the wind may have some slight influence in producing the effects mentioned above, they are in the main due to its drying action.

In some environments—sand-dunes—the wind exercises a very important indirect effect by moving the substratum in which the plants are growing.

THE HORSE.

High Prices There—No Demand Here.

Canadian horsemen, who cannot dispose of their horses because of lack of market demand, will wonder, when they read our English correspondent's article in the Live Stock Department of this issue, why they cannot sell their horses. In Britain, in 1915, horses have sold for at least \$120 each more than heretofore. Such is the statement of a man familiar with the trade over there. The average for foal sales showed an advance of nearly \$55 per head over similar sales in 1914. Our horsemen will be pleased to know that the British horse breeder is finding ready sale at high prices, but this does not help matters. It is more than likely that the British Government could buy horses at less money in Canada than it is costing them to purchase at home and in neutral countries, but, for some reason, outside buyers have not operated extensively in Canada. Do they not want our horses or do we not want them to get them? There is no doubt about the farmer's wishes in the matter. He is anxious for and deserving of a market for his surplus horses, and if he cannot get it, he rightfully asks why. While marketing commissions and authorities are investigating other marketing problems, it might be as well if they threw a little light on the horse-market situation. And the matter of United States horses going through in bond and free

of duty and the cripples unloaded and dumped on Canada, if such be the case, should be looked into. A little action, or, at least, a straightforward statement would be appreciated by Canadian farmers and horsemen.

Lameness in Horses III.

The examiner, having become satisfied which leg the horse is lame in, must now endeavor to find the seat of its cause. In all cases where doubt exists as to the seat of lameness, it is good practice to remove the shoe and examine the foot carefully; and, if he fails to find anything wrong there, he must endeavor to find out where the lameness is by careful manual examination, assisted by the peculiarity of action, which will be discussed in future articles as the various lamenesses are observed.

Lameness is not of itself a disease, but a symptom of disease. It is an expression of pain or inability, the result of disease, accident or malformation in the limb or limbs in which it is manifested. It may, however, arise from disease apart from the limbs, as from injury to or disease of the spinal cord, disease of the brain, nerves or arteries, and occasionally from disease of the liver. It may exist for a time independent of disease—a mere expression of pain without actual disease, as from a stone caught in the shoe, an ill-fitting shoe, a shoe the nails of which are too tightly clinched, etc., but if these causes of pain and lameness continue for any considerable length of time, disease is sure to follow. Disease without lameness much oftener exists in a limb than lameness without disease. Thus, a horse may have a wound, ulcer, bony deposit, tumor or other diseased condition in a limb and at the same time go sound. Some authorities claim that any impediment in action is lameness, while others claim that lameness cannot exist without pain, and that where disease which interferes with action but does not cause pain exists, it causes stiffness, but not lameness. For example, the fracture of a bone or inflammatory action in a joint may result in ankylosis (the union of two or more bones into one big bony deposit) of two or more bones of the joint, when, where inflammatory action has ceased, causes no pain, but interferes more or less with action causing the horse to go stiff with the affected limb. Again, complete dislocation of the patella (stifle bone) causes the animal no pain, but produces complete inability to use the limb.

Pain may be generally said to be the cause of lameness. The patient feels the pain, either when he moves the limb or when he bears weight or presses upon it. During progression the patient endeavors to avoid throwing weight upon the lame leg by treading lightly or stepping short, and by removing weight as far from the seat of pain as possible. Not only by using the lame limb in a manner calculated for this purpose, as by treading on the heels when the pain is in the toe, and vice versa, but also throwing as little weight as possible on the lame limb.

Weakness of the limbs, either congenital or acquired, may cause lameness, and inability to perform the functions of progression properly. For example, want of development of muscular fibre in the extensor muscles of the forearm, sometimes seen in foals, causes the animal to stand and walk upon the front part of the fetlock joint, the heel of the foot and the fetlock pad being thus brought into close contact, due to the flexor muscles being well developed and having little antagonistic power opposed to them; the fetlock joint is flexed and the power of progression greatly interfered with. Again, a horse may be lame by access of tonic in the muscles of a limb, accompanied by great pain, as in muscular cramp, which renders him very lame for a time.

For the detection of the lame limb, the following general rules should be observed. When the foot of the lame limb comes in contact with the ground during progression, the patient suddenly elevates that side of the body and drops the other side. If the lameness be in the fore limb, the head, as well as the fore part of the body, is raised from the lame and dropped upon the sound limb. This is called "nodding," hence the animal nods when the sound limb touches the ground. If the lameness be in a hind limb, the quarter of the lame side will be elevated, and that of the sound side thrown forwards and downwards with a jerking motion, the head being held moderately steady, unless the pain be excessive, in which case it may be jerked in agony.

The symptoms indicating the seat of lameness are of two kinds: (1) Those manifested during action, and (2) those discoverable by an examination while the animal is at rest. In some cases the latter alone are sufficient to indicate the seat and nature of the disease, but in such cases the lameness must be well marked, manifested by "pointing," standing with the lame leg flexed or elevated from the ground, with the healthy feet placed as much under the body as possible in order to bear its weight.

In most cases, however, it is necessary to cause the patient to perform some movement; and experience teaches us that a slow, easy trot on hard ground, with a free head, is the best pace. A horse may walk lame, but in most cases the peculiar characteristics of the lameness is best shown at the gait mentioned. There are cases of lameness, however, as in slight splint lameness, where it is necessary to urge the patient to a sharp trot before any deviation from the normal gait can be noticed.

WHIP.

Can you manufacture a reasonable excuse for using a scrub sire?

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Making a Start to Improve the Market.

The Ontario Horse Breeders' Association held a meeting last Tuesday in Toronto to discuss some matters pertaining to the purchase of army horses in Canada and the dumping of rejected army horses in this province, which horses had been shipped through from the United States. John Bright, Live Stock Commissioner, denied the rumors that horses from the other side had been dumped here, stating that of the 30,000 animals purchased in Canada and of the thousands passing through from the United States only 300 rejects have been sold, and all of these were given veterinary inspection before being disposed of. Mr. Bright is also reported as stating on the authority of the Premier that the Government had never ceased to buy horses in Canada, and advised Ontario breeders not to dispose of their good mares, believing that all the horses in Canada would be needed before the end of this war. Because of the dissatisfaction among farmers and horse breeders over the present situation a committee composed of John Boag, Wm. Smith and Robt. Graham was appointed to discuss with the Minister of Agriculture the question of buying remounts for the Dominion of Canada.

We are glad to know that a committee has been appointed to look into the matter, for there certainly is dissatisfaction, and not without reason. We attended a sale on the same day that this meeting was called in Toronto, and at that sale a good team of heavy draft work horses were put up, with a large crowd present, and never a bid was forthcoming. The men at this sale paid fair prices for cattle, but would not bid on horses, and the horses went back to their stalls without anyone bidding even as much as \$25 for them. Now, these were not cull horses, for a little more than a year ago their owner refused \$300 for one of the team. This is only typical of horse-market conditions the province over, and when we know that horses are scarce in Britain and are commanding unprecedentedly high prices, and when the horse breeder reads that the Allied Governments have spent millions of dollars for horses in the United States while Canada's horses are unsaleable, it is time someone looked into the cause of the trouble. We hope that the committee is able to bring enough pressure to bear upon the powers that be that Canada may at least have a part of the trade now being carried on for army horses. If the Government has never stopped buying, they have so nearly done so on many occasions as not to be an important factor in the horse-market conditions of the country.

Mr. Boag, Mr. Graham and Mr. Smith have an important work in hand, and we know them well enough to state that if they are given any opportunity to do something for the horse breeders of Canada, they will do it, and we have hopes that horse-market conditions in the very near future will greatly improve. There is no use saying that everything has been done that could be done for the horse markets of Canada. If it had, there would be no dissatisfaction at the present time, and the bulk of this country's surplus horses would have been disposed of for army purposes.

LIVE STOCK.

Raising Orphan Pigs.

Editor THE FARMER'S ADVOCATE:

I am going to write you of my experience in raising a whole family of pigs. Twelve hours after giving birth to a litter of ten fine pigs our sow died suddenly, and as it seemed a shame to allow such a profitable lot of youngsters to die, I determined to do my best to save them. I let them get good and hungry before experimenting with them; then, taking each separately, I poured a little warm milk down their throats. This seemed to satisfy them, but in a little while they were hungry again. For their feed I took about three parts milk and one part water and sweetened this slightly with a little brown sugar. I rigged up two boxes with clean, dry bedding in each, and put them beside a stove which we had in an outside kitchen and put the pigs in one of these. Every 1½ hours, night and day, I fed them, taking one at a time and, as it was fed, putting it in the other box. I had a small round dish, and the little fellows would keep their noses pressed against the side of the dish and would soon drink greedily. After getting them in the second box, the first one was cleaned out and dry bedding put in ready for their next feed. I kept this up for 10 days, and at the end of that time I added a little well-cooked porridge made from corn meal and rolled oats in equal parts. Then I gradually lengthened the time between feeds from 1½ hours to 3 hours, and by this time they were thriving and living in a pen of their own and drinking from a trough as pig-like. I then left off feeding them at night, but would feed them the last thing before going to bed.

A nicer family of pigs never lived. They knew me and came at the slightest call, and would follow me everywhere if allowed. To my delight they grew and grew, getting greedier and greedier until I knew my experiment was proving a success. Between six and eight weeks they were growing so nicely that I found we could feed them any sort of pig feed. My troubles were over, and at five months my porkers averaged from 125 to 150 pounds each.

I have often seen enquiries about raising young pigs by hand, and trust this may prove helpful to any one left with such a lot of orphans on their hands. Algoma District.

MRS. M. WARAM.

Live

EDITOR OF THE

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