paid well in dollars and cents, and I have derived a great deal of pleasure and satisfaction in watching their development. In breeding this kind of a horse, you are liable to get speed enough in some of them to make them command a long price. Sell those (if not your best fillies), for they are dangerous property for the average man to own. They are apt to turn his head and spoil the boys. Be satisfied to breed them; let the other fellow sport with them. They will all be good road horses. Good farm horses will fill more places well than any other breed that I know of. While I have not been breeding for speed, considerable has cropped out. I bred St. Albans, with a record of 2:20 1/2, Western Boy, 2:26, and a good many that could beat three minutes. The first two named were large enough to draw a reaper or a heavy family carriage, but their gait was so rapid that they were promoted from a Wisconsin farm to draw the family carriage of a New York City millionaire at a cost of $4,000. I did not get that, but I got all I asked, and ought to be satisfied.

Recapitulation.—Breed only from large, sound, well formed mares, good color and disposition. Breed in line from standard-bred stallions. Keep in mind the laws of heredity; remember, the colt generally takes its disposition from the dam, the conformation from the sire. Use a sire that has size, form, substance and breeding. If he is a fast, gamy trotter, so much the better; it shows strength, will and constitution. Feed the colts bone and muscle-forming food in sufficient quantity to keep them growing; never let them go backwards or stand still. Last but not least, carefully educate them; this will not be done unless the groom has some good horse sense. Be mild, gentle, yet firm. Speak to them in a low tone; they are quick to hear, and will try to please you when they know what you want. Exercise at least as much patience with them as you would with a dull boy, and they will be just as apt scholars. Reward them for good behavior by petting them and calling them good fellows. Remember they have got a will of their own; do not try to break it. Your business is to turn it in the right direction; teach them to use it in finding the end of the road, in disdaining to travel in the other horses’ dust. Utilized in this way, it becomes a cardinal virtue. Turned in the wrong direction, it becomes an unmitigated vice.

THE CONFORMATION OF THE HORSE.

By V. T. ATKINSON, V. S., Milwaukee, Wis.

Fifth Paper.

The Perfect Horse.—When first asked to address this audience by Supt. Morrison, I supposed that I was intended to do something of the same kind of work that we are doing at the institutes. He asked me to give a talk on the conformation of the horse, and to illustrate it by the use of this model. Now, I find there are a good many people who have come here more to see the model than...
to hear me talk. Perhaps it will be well to consider the conformation of a perfect horse. The horse that I will outline may not be your ideal horse. We differ in our tastes on horses as much as on other things. I will just run over the outline of a perfect horse, according to my idea. Of course, proportion and graceful outline go for a good deal.

Points.—In looking for an animal approaching perfection, we expect to find the head not too large in proportion, the forehead broad and flat. The brain is situated in the cavity beneath, and the space between the eyes is indicative of storeroom above—the position which the brain occupies. The eye is lively and full of fire, the face straight, the nostril wide, the lips thin, the ear firm. The muscles on the sides of the cheek are well developed; these are the engines that carry on the first process of digestion—mastication; they are the grinding stones that crush the food. Running back, the neck should be curved above, straight on the line below, widening gradually toward the body, and not too full toward the head. We find, sometimes, necks looking as if they were put on wrong side up; what we call a yoke-necked animal, not a pretty thing. Then we find the opposite of that, what we call a bull-neck, anything but beautiful. Passing backward, the front legs should run in a straight line down from the body; the two feet should approach each other slightly, looked at from in front. The shoulder should suit the purpose for which the animal is intended. If for speed it should be flat. If for draft it should be upright. The front legs are the carrying power of the animal. They are the parts on which the animal's weight rests mainly, while the hind legs force the animal forward over the ground. The feet should be a little nearer the center of gravity. Looking at the leg sidewise, the arm below should be long in proportion to the parts below the knee, the whole limb descending in a straight line from the shoulder.

A low down knee is desirable in a horse, enabling the animal to make a long stride more quickly than when the knee is set high up. Speaking in general, a rough joint, as a rule, is a good joint, not one that is smooth where the interstices between the bones are filled in by what we call false tissues, that which is called a gummy joint. The knee and fetlock should be large, broad in front and distinctly marked with bony prominences. The fetlock should slant to an angle of about 45 degrees, running down to the hoof.

The foot on its ground surface should be round, and in size proportionate to its owner. The line of the front wall should be parallel to the centre of the pastern and at an angle of about 45 degrees with the sole.

In considering the body, see to it that there is room enough for the lungs and digestive apparatus.

The breast should be prominent. The ribs should stand out with sufficient curve to afford space enough within. The back should be straight and not too long; the loins wide and flanks full. The tail should be set on at the right place, for it is impossible to have a good appearing horse unless he have two good ends. The hips and quarters should be well muscled and strong. The stifles should project boldly forward and have a perceptible irregularity of surface. The thigh should be muscular, thick and proportionately long; the hock wide from before backwards; rough and prominent. Its front should stand straight backwards, and when viewed from the side it should not have too much curve.

Appreciating the shortness of the
time allotted to this talk, I have run over these points very rapidly. In order that what I have said may be fully understood, I will now make a rapid dissection of this model which is the one used to illustrate the course in veterinary science at the university. It can be so detached and arranged as to show over three thousand anatomical parts. (The doctor then dissected the model completely and briefly explained each part.) If there is anything farther you desire to know, please ask questions.

**Discussion.**

**Mr. Sloan.—** Doctor, I have seen it stated somewhere that the cannon bone of the draft horse is light and porous while the cannon bone of the thoroughbred is like steel. Has any actual scientific investigation been made by the microscope or otherwise, so that we can know whether there is any difference in the composition of the bones of the leg of the thoroughbred horse and the draft horse?

**Dr. Atkinson.—** Nature has arranged that the different bones shall be made to suit the peculiar requirements of the animal. The bone is made up of two different styles of tissues. There is the compact or denser element, and the cancellated. If you make a section of the cannon bone of a deer, then make a section of the cannon bone of an elephant, you will find a great difference in the structure of the two bones. You find on the deer's leg a very heavy layer of hard tissue on the outside, and the softer structure much less in proportion. In the elephant you find only a trace of the compact tissue. If you will take a cross section of the leg of a race horse that has been bred continually so for many years, and then a similar section of the leg of a heavy draft horse, you will find the same kind of tissue in each but a larger amount of cancellated or soft tissue in the larger horse's bone than in the small one's, while the smaller bone would be likely to have more of the compact or hard tissue.

**Mr. Urquhart.—** I have not noticed in the paper what this gentleman speaks of, and also they claim that the feeding makes the difference. The draft horse being fed corn, it didn't have a tendency to make the muscles of a race horse. I would like to know about that.

**Dr. Atkinson.—** Prof. Henry could answer you on that subject more ably than I. Of course, the animal is influenced by all the surrounding influences, and has inherited some peculiar attributes. Exactly how much can be done by feeding has not yet been demonstrated. I think there is no person to-day, who knows much more about feeding than Prof. Henry does.

**Prof. Henry.—** Mr. Chairman, within a week, assisted by Dr. Atkinson and Mr. Theodore Louis and our short course class of students, we weighed the bones of animals fed differently, and I would say that the thigh bones of a pig fed exclusively corn, stood a strain of 170 lbs. pressure, in order to crush it, for each 100 lbs. weight, while that of a hog fed upon shorts stood 270 lbs. pressure, a difference of over fifty per cent, and that difference was brought about by feeding exclusively corn for ninety-eight days in one case, and shorts and corn in the other. We have repeated it again and again and always come out the same way, and I think it is fair to infer that the feed did make the difference.

**Gen. Parkinson.—** Doctor, I would like you to explain to this audience with your model, what is curb, and what produces it.

**Dr. Atkinson.—** The ligament at the back part of the hock is likely to be
strained. When an animal is subjected to a severe strain, or in attempting to make a long leap, or is thrown violently back upon its haunches, a great deal of stress is thrown there, and this ligament is liable to strain or partial rupture of some of its fibres. When that occurs it is followed by swelling, inflammation and tenderness. It is liable to recur if the joint is of faulty construction. Generally when it first occurs, it can be gotten rid of, but if it returns it is more difficult to get rid of.

Mr. Struve.—Can it be made as strong?

Dr. Atkinson.—That depends upon the shape of the hock. As a rule it is not possible to make a joint stronger than it was in its first natural condition.

Mr. Phillips.—We lost in our section a very valuable horse, and the cause given was this: He had been fed concentrated food, oats, etc., through the early part of the season; in the after part of the season they let him eat all the clover he could, which distended his stomach to such an extent that it caused his death. Now, it is important for the farmers to know if a change of food can have that effect. One veterinary surgeon said he had eaten so much that it burst his stomach; another said that when he fell it burst his stomach. Please give us a little light.

Dr. Atkinson.—You can understand why I should hesitate to criticise the opinion of another veterinary surgeon. Of course, sudden, violent changes are always objectionable. Rupture of the stomach does sometimes occur; the stomach of a horse is very small.

Mr. Urquhart.—I want to ask about the hoof of the horse. Do you think it is necessary to keep the frog in a healthy growing state, to keep the foot from contracting?

Dr. Atkinson.—The foot is complete as nature made it, and adapted exactly the conditions in which nature placed the animal; that is, the foot will grow just about rapidly enough to keep in a healthy condition when the animal is running on pasture, when the foot is wet every morning by the dew on the grass and when the animal goes to drink. The frog is as essential to the well being of the foot as any other part. When you place an animal on what we call good roads, good as far as the rider is concerned, but not so far as the foot is concerned, if you neglect the frog or allow it to contract, it will press in on the soft part of the foot, pressing in on the cartilages, and injure the little arteries so that free blood passes down through the sole and forms what is called a corn.

The frog should be cared for in some way; exactly in what way depends on the surrounding circumstances. I have seen draft horses that couldn’t stand up without their shoes on. The frog had been neglected so long and would grow so full, that if you took the shoes off the whole weight would be thrown on the frog and the pain would be so great that he would not stand.

Question.—Do you think it wise to have the shoe bear on all parts of the horse’s foot, or would you spring the heels?

Dr. Atkinson.—In preparing the hoof for the shoe, it should be made perfectly level. Then the shoe should be made to fit the foot, and be allowed to press equally on all parts. If you attempt to spring it up, in springing back, by striking, it is apt to do more harm than good.

Mr. Fish.—Do you consider the general practice of trimming the frog by horse-shoers, detrimental or dangerous?

Dr. Atkinson.—I must answer that again by saying that it depends largely
upon the condition of the frog. If the frog is healthy and soft, let it alone; if it is unhealthy, of course you must trim it. As a rule, the foot should be prepared, made perfectly level on its lower surface, then the sole cleaned out, and all the dead parts of the hoof taken from it. After you have gone through the dead part, don't take any more. You should not cut it down until you can put your thumb on and feel it spring under it. It is too thin when it is that far along. The frog, if it is healthy, should simply be cleaned off on the outside.

Mr. Brown.—What would be the effect of a hot shoe?

Dr. Atkinson.—The first requisite is that the shoe should be made to fit the foot, not the foot to fit the shoe, and it should bear equally on all parts of the foot. If the horseshoe, in order to make a perfect fit, heats his shoe and applies it just until it smokes, and then trims off until it will fit, it is not objectionable. There is another way, but I never knew of a horse-shoer that would do it. If he would put his shoe into a box of chalk and then put it on, he could see just as well as if he burns it on. If he allows that hot shoe to remain on until the animal flinches, he has done a great deal of harm. The heat should not be permitted near the delicate tissues above. If it is, it is liable to be followed by the conditions of any burn. You are liable to have the whole sole sluff off.

Mr. Bender.—Can you tell us about the disease known as ring-bone?

Dr. Atkinson.—The middle joint of the pastern is generally the seat of the ring-bone. First it is simply an inflammation of the joint; then a deposit of bone is thrown out, and if that condition continues, the two bones unite into one. After the bone has begun to form into a ring-bone, the animal never can be cured, that is, restored to its former condition, but the other joint can perform the work if the union of the two bones which constitute the diseased joint be complete so that the joint is obliterated.

Mr. Lockwood.—Isn't it better for the general farm horse not to be shod at all?

Dr. Atkinson.—Well, the experience of all people, of all times, has been that the horse should be shod. There are conditions under which the ordinary farm horse may be kept without shoes, but if they are going to be used at all on the road, you are liable to have trouble. The structure of the foot won't grow rapidly enough to compensate for the wear of common use.

Question.—We want to know about "founder" of the horse.

Dr. Atkinson.—This disease is perhaps the most painful one that a horse is heir to, and generally results either from chill or over-exertion. It attacks what we call the sensitive lamina—the structure by which the sensitive and insensitive parts of the foot are united—and they become inflamed, and it is as if there were an acute inflammation and something put on and pressed against it. The peculiar position which the animal takes in traveling has led to error. The animal tries to get the weight off the lamina as much as possible. If he can get his weight back on his heels, he will get some relief, and in endeavoring to do that he keeps his feet well out in front of him—so far in front that he has the appearance of having a sunken chest. The shoulders are thrown forward on the side of the chest and the feet away out. There is no disease of the chest in the disease called founder.

Question.—What means would you propose to help that disease?

Dr. Atkinson.—The inflammation must be allayed. There is quite a long course of treatment. The simplest one is what is lately known as the American, and is to give the animal half an ounce of saltpetre, nitrate of potash, every three hours until he gets relief. I do not think bleeding of the toe should be practiced until diffusion of the blood is likely to take place. The foot should be kept cooled as much as possible by the application of cold water. If the inflammation is continued three or four days you are liable to have effusion take place between the sensitive and insensitive laminae, and separation of these parts.

Prop. Henry.—I see there are many here who would like to know more on these subjects, and I suggest these farmers send their boys up next winter to hear Dr. Atkinson talk about them.