

Diseases Of The Horse

Section 1 of 16



The Examination of a Sick Horse *By Leonard Pearson*

SPECIAL REPORT
ON
DISEASES OF THE HORSE

BY
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SPECIAL REPORT ON DISEASES OF THE HORSE.

THE EXAMINATION OF A SICK HORSE

By Leonard Pearson, B. S., V. M. D.

In the examination of a sick horse it is important to have a method or system.

If a definite plan of examination is followed one may feel reasonably sure, when the examination is finished, that no important point has been overlooked and that the examiner is in a position to arrive at an opinion that is as accurate as is possible for him.

Of course, an experienced eye can see, and a trained hand can feel, slight alterations or variations from the normal that are not perceptible to the unskilled observer.

A thorough knowledge of the conditions that exist in health is of the highest importance, because it is only by a knowledge of what is right that one can surely detect a wrong condition.

A knowledge of anatomy, or of the structure of the body, and of physiology, or the functions and activities of the body, lie at the bottom of accuracy of diagnosis.

It is important to remember that animals of different races or families deport themselves differently under the influence of the same disease or pathological process.

The sensitive and highly organized thoroughbred resists cerebral

depression more than does the lymphatic draft horse.

Hence a degree of fever that does not produce marked dullness in a thoroughbred may cause the most abject dejection in a coarsely bred, heavy draft horse.

This and similar facts are of vast importance in the diagnosis of disease and in the recognition of its significance.

The order of examination, as given hereafter, is one that has proved to be comparatively easy of application and sufficiently thorough for the purpose of the readers of this work, and is recommended by several writers.

HISTORY

It is important to know, first of all, something of the origin and development of the disease; therefore the cause should be looked for.

The cause of a disease is important, not only in connection with diagnosis, but also in connection with treatment.

The character of feed that the horse has had, the use to which he has been put, and the kind of care he has received should all be closely inquired into.

It may be found by this investigation that the horse has been fed on damaged feed, such as brewers' grains or moldy silage, and this may be sufficient to explain the profound

depression and weakness that are characteristic of forage poisoning.

If it is learned that the horse has been kept in the stable without exercise for several days and upon full rations, and that he became suddenly lame in his back and hind legs, and finally fell to the ground from what appeared to be partial paralysis, this knowledge, taken in connection with a few evident symptoms, will be enough to establish a diagnosis of azoturia (excess of nitrogen in the urine).

If it is learned that the horse has been recently shipped in the cars or has been through a dealer's stable, we have knowledge of significance in connection with the causation of a possible febrile disease, which is, under these conditions, likely to prove to be influenza, or edematous pneumonia.

It is also important to know whether the particular horse under examination is the only one in the stable, or on the premises that is similarly afflicted.

If it is found that several horses are afflicted much in the same way, we have evidence of a common cause of disease which may prove to be of an infectious nature.

Another item of importance in connection with the history of the case relates to the treatment that the horse may have had before he is examined.

It sometimes happens that medicine given in excessive quantities produces symptoms resembling those of disease, so it is important that the

examiner be fully informed as to the medication that has been employed.

ATTITUDE AND GENERAL CONDITION

Before beginning the special examination, attention should be paid to the attitude and general condition of the animal.

Sometimes horses assume positions that are characteristic of a certain disease.

For example, in tetanus (lockjaw) the muscles of the face, neck, and shoulders are stiff and rigid, as well as the muscles of the jaw.

This condition produces a peculiar attitude, that once seen is subsequently recognized as rather characteristic of the disease.

A horse with tetanus stands with his muscles tense and his legs in a somewhat bracing position, as though he were gathered to repel a shock.

The neck is stiff and hard, the head is slightly extended upon it, and the face is drawn, and the nostrils are dilated.

The tail is usually held up a little, and when pressed down against the thighs it springs back to its previous position.

In inflammation of the throat, as in pharyngolaryngitis, the head is extended upon the neck and the angle between the jaw and the lower border of the neck is opened as far as possible to relieve the pressure that otherwise would fall upon the throat.

In dummies, or immobility, the hanging position of the head and the stupid expression are rather characteristic.

In pleurisy, peritonitis, and some other painful diseases of the internal organs, the rigid position of the body denotes an effort of the animal to avoid pressure upon and to protect the inflamed sensitive region.

The horse may be down in the stall and unable to rise. This condition may result from paraplegia (paralysis), from azoturia, from forage poisoning, from tetanus, or from painful conditions of the bones or feet, such as osteoporosis or founder.

Lying down at unusual times or in unusual positions may indicate disease.

The first symptom of colic may be a desire on the part of the horse to lie down at an unusual or inappropriate time or place.

Sometimes disinclination to lie down is an indication of disease. When there is difficulty in breathing, the horse knows that he can manage himself better upon his feet than upon his breast or his side.

It happens, therefore, that in nearly all serious diseases of the respiratory tract he stands persistently, day and night, until recovery has commenced and breathing is easier, or until the animal falls from sheer exhaustion.

If there is stiffness and soreness of the muscles, as in rheumatism, inflammation of the muscles from

overwork, or of the bones in osteoporosis, or of the feet in founder, or if the muscles are stiff and beyond control of the animal, as in tetanus, a standing position is maintained, because the horse seems to realize that when he lies down he will be unable to rise.

Abnormal attitudes are assumed in painful diseases of the digestive organs (colic).

A horse with colic may sit upon his haunches, like a dog, or may stand upon his hind feet and rest upon his knees in front, or he may endeavor to balance himself upon his back, with all four feet in the air.

These positions are assumed because they give relief from pain by lessening pressure or tension upon the sensitive structures.

Under the general condition of the animal it is necessary to observe the condition or state of nutrition, the conformation, so far as it may indicate the constitution, and the temperament.

By observing the condition of nutrition one may be able to determine to a certain extent the effect that the disease has already had upon the animal and to estimate the amount of strength that remains and that will be available for the repair of the diseased tissues.

A good condition of nutrition is shown by the rotundity of the body, the pliability and softness of the skin, and the tone of the hair.

If the subcutaneous fat has disappeared and the muscles are wasted, allowing the bony prominences to stand out; if the skin is tight and inelastic and the coat dry and harsh, we have evidence of a low state of nutrition.

This may have resulted from a severe and long-continued disease or from lack of proper feed and care. When an animal is emaciated—that is, becomes thin—there is first a loss of fat and later the muscles shrink.

By observing the amount of shrinkage in the muscles one has some indication as to the duration of the unfavorable conditions under which the animal has lived.

By constitution we understand the innate ability of the animal to withstand disease or unfavorable conditions of life.

The constitution depends largely upon the conformation.

The type of construction that usually accompanies the best constitution is deep, broad chest, allowing plenty of room for the lungs and heart, indicating that these vital organs are well developed; capacious abdomen, allowing sufficient space for well-developed organs of digestion; the loins should be short—that is, the space should be short between the last rib and the point of the hip; the head and neck should be well molded, without superfluous or useless tissue; this gives a clear-cut throat.

The ears, eyes, and face should have an expression of alertness and good breeding.

The muscular development should be good; the shoulders, forearms, croup, and thighs must have the appearance of strength.

The withers are sharp, which means that they are not loaded with useless, superfluous tissue; the legs are straight and their axes are parallel; the knees and hocks are low, which means that the forearms and thighs are long and the cannons relatively short.

The cannons are broad from in front to behind and relatively thin from side to side.

This means that the bony and tendinous structures of the legs are well developed and well placed.

The hoofs are compact, tense, firm structures, and their soles are concave and frogs large. Such a horse is likely to have a good constitution and to be able to resist hard work, fatigue, and disease to a maximum degree.

On the other hand, a poor constitution is indicated by a shallow, narrow chest, small bones, long loins, coarse neck and head, with thick throat, small, bony, and muscular development, short thighs and forearms, small joints, long, round cannons, and hoofs of open texture with flat soles.

The temperament is indicated by the manner in which the horse responds to external stimuli.

When the horse is spoken to, or when he sees or feels anything that stimulates or gives alarm, if he responds actively, quickly, and intelligently, he is said to be of lively, or nervous, temperament.

On the other hand, if he responds in a slow, sluggish manner, he is said to have a sluggish, or lymphatic,[Pg 11] temperament.

The temperament is indicated by the gait, by the expression of the face, and by the carriage of the head and ears.

The nature of the temperament should be taken into consideration in an endeavor to ascertain the severity of a given case of illness, because the general expression of an animal in disease as well as in health depends to a large extent on the temperament.

THE SKIN AND THE VISIBLE MUCOUS MEMBRANES

The condition of the skin is a fair index to the condition of the animal.

The effect of disease and emaciation upon the pliability of the skin have been referred to above.

There is no part of the body that loses its elasticity and tone as a result of disease sooner than the skin.

The practical herdsman or flockmaster can gain a great deal of information as to the condition, of an animal merely by grasping the coat and looking at and feeling the skin.

Similarly, the condition of the animal is shown to a certain extent by the appearance of the mucous membranes.

For example, when the horse is anemic as a result of disease or of inappropriate feed the mucous membranes become pale.

This change in the mucous membranes can be seen most readily in the lining of the eyelids and in the lining of the nostril.

For convenience of examination the eyelids can readily be everted.

Paleness means weak circulation or poor blood.

Increased redness occurs physiologically in painful conditions, excitement, and following severe exertion.

Under such conditions the increase of circulation is transitory.

In fevers there is an increased redness in the mucous membrane, and this continues so long as the fever lasts.

In some diseases red spots or streaks form in the mucous membrane. This usually indicates an infectious disease of considerable severity, and occurs in blood poisoning, purpura hemorrhagica, hemorrhagic septicemia, and in urticaria.

When the liver is deranged and does not operate, or when the red-blood corpuscles are broken down, as in serious cases of influenza, there is a yellowish discoloration of the mucous membrane.

The mucous membranes become bluish or blue when the blood is imperfectly oxidized and contains an excess of carbon dioxide.

This condition exists in any serious disease of the respiratory tract, as pneumonia, and in heart failure.

The temperature of the skin varies with the temperature of the body.

If there is fever the temperature of the skin is likely to be increased.

Sometimes, however, as a result of poor circulation and irregular distribution of the blood, the body may be warmer than normal, while the extremities (the legs and ears) may be cold.

Where the general surface of the body becomes cold it is evident that the small blood vessels in the skin have contracted and are keeping the blood away, as during a chill, or that the heart is weak and is unable to pump the blood to the surface, and that the animal is on the verge of collapse.

The skin is moist, to a certain degree, at all times in a healthy horse.

This moisture is not in the form of a perceptible sweat, but it is enough to keep the skin pliable and to cause the hair to have a soft, healthy feel.

In some chronic diseased conditions and in fever, the skin becomes dry.

In this case the hair has a harsh feel that is quite different from the condition observed in health, and from the fact of its being so dry the individual hairs do not adhere to one another, they

stand apart, and the animal has what is known as "a staring coat."

When, during a fever, sweating occurs, it is usually an indication that the crisis is passed.

Sometimes sweating is an indication of pain. A horse with tetanus or azoturia sweats profusely.

Horses sweat freely when there is a serious impediment to respiration; they sweat under excitement, and, of course, from the well-known physiological causes of heat and work.

Local sweating, or sweating of a restricted area of the body, denotes some kind of nerve interference.

Swellings of the skin usually come from wounds or other external causes and have no special connection with the diagnosis of internal diseases.

There are, however, a number of conditions in which the swelling of the skin is a symptom of a derangement of some other part of the body.

For example, there is the well-known "stocking," or swelling of the legs about the fetlock joints, in influenza.

There is the soft swelling of the hind legs that occurs so often in draft horses when standing still and that comes from previous inflammation (lymphangitis) or from insufficient heart power.

Dropsy, or edema of the skin, may occur beneath the chest or abdomen from heart insufficiency or from chronic collection of fluid in the chest or abdomen (hydrothorax, ascites, or

anemia). In anasarca or purpura hemorrhagica large soft swellings appear on any part of the skin, but usually on the legs, side of the body, and about the head.

Gas collects under the skin in some instances. This comes from a local inoculation with an organism which produces a fermentation beneath the skin and causes the liberation of gas which inflates the skin, or the gas may be air that enters through a wound penetrating some air-containing organ, as the lungs.

The condition here described is known as emphysema. Emphysema may follow the fracture of a rib when the end of a bone is forced inward and caused to penetrate the lung, or it may occur when, as a result of an ulcerating process, an organ containing air is perforated.

This accident is more common in cattle than it is in horses.

Emphysema is recognized by the fact that the swelling that it causes is not hot or sensitive on pressure.

It emits a peculiar crackling sound when it is stroked or pressed upon.

Wounds of the skin may be of importance in the diagnosis of internal disease.

Wounds over the bony prominence, as the point of the hip, the point of the shoulder, and the greatest convexity of the ribs, occur when a horse is unable to stand for a long time and, through continually lying upon his side, has shut off the circulation to the portion of

the skin that covers parts of the body that carry the greatest weight, and in this way has caused them to mortify.

Little, round, soft, doughlike swellings occur on the skin and may be scattered freely over the surface of the body when the horse is afflicted with urticaria.

Similar eruptions, but distributed less generally, about the size of a silver dollar, may occur as a symptom of dourine, or colt distemper.

Hard lumps, from which radiate welt-like swellings of the lymphatics, occur in glanders, and blisterlike eruptions occur around the mouth and pasterns in horsepox.

THE ORGANS OF CIRCULATION

The first item in this portion of the examination consists in taking the pulse.

The pulse may be counted and its character may be determined at any point where a large artery occupies a situation close to the skin and above a hard tissue, such as a bone, cartilage, or tendon.

The most convenient place for taking the pulse of the horse is at the jaw.

The external maxillary artery runs from between the jaws, around the lower border of the jawbone, and up on the outside of the jawbone to the face.

It is located immediately in front of the heavy muscles of the cheek.

Its throb can be felt most distinctly just before it turns around the lower border of the jawbone.

The balls of the first and second or of the second and third fingers should be pressed lightly on the skin over this artery when its pulsations are to be studied.

The normal pulse of the healthy horse varies in frequency as follows:

Stallion	28 to 32 beats per minute.
Gelding	33 to 38 beats per minute.
Mare	34 to 40 beats per minute.
Foal 2 to 3 years old	40 to 50 beats per minute.
Foal 6 to 12 months old	45 to 60 beats per minute.
Foal 2 to 4 weeks old	70 to 90 beats per minute.

The pulse is accelerated by the digestion of rich food, by hot weather, exercise, excitement, and alarm.

It is slightly more rapid in the evening than it is in the morning.

Well-bred horses have a slightly more rapid pulse than sluggish, cold-blooded horses.

The pulse should be regular; that is, the separate beats should follow each other after intervals of equal length, and the beats should be of equal fullness, or volume.

In disease, the pulse may become slower or more rapid than in health.

Slowing of the pulse may be caused by old age, great exhaustion, or excessive cold.

It may be due to depression of the central nervous system, as in dumminess, or be the result of the administration of drugs, such as digitalis or strophanthus.

A rapid pulse is almost always found in fever, and the more severe the infection and the weaker the heart the more rapid is the pulse.

Under these conditions, the beats may rise to 80, 90, or even 120 per minute.

When the pulse is above 100 per minute the outlook for recovery is not promising, and especially if this symptom accompanies high temperature or occurs late in an infectious disease. In nearly all of the diseases of the heart and in anemia the pulse becomes rapid.

The pulse is irregular in diseases of the heart, and especially where the valves are affected.

The irregularity may consist in varying intervals between the beats or the

dropping of one or more beats at regular or irregular intervals.

The latter condition sometimes occurs in chronic diseases of the brain. The pulse is said to be weak, or soft, when the beats are indistinct, because little blood is forced through the artery by each contraction of the heart.

This condition occurs when there is a constriction of the vessels leading from the heart and it occurs in certain infectious and febrile diseases, and is an indication of heart weakness.

In examining the heart itself it is necessary to recall that it lies in the anterior portion of the chest slightly to the left of the median line and that it extends from the third to the sixth rib.

It extends almost to the breastbone, and a little more than half of the distance between the breastbone and the backbone.

In contracting, it rotates slightly on its axis, so that the point of the heart, which lies below, is pressed against the left chest wall at a place immediately above the point of the elbow.

The heart has in it four chambers—two in the left and two in the right side.

The upper chamber of the left side (left auricle) receives the blood as it comes from the lungs, passes it to the lower chamber of the left side (left ventricle), and from here it is sent with great force (for this chamber has very strong, thick walls) through the aorta and its branches (the arteries) to all parts of the body.

The blood returns through the veins to the upper chamber of the right side (right auricle), passes then to the lower chamber of the right side (right ventricle), and from this chamber is forced into the lungs to be oxidized.

The openings between the chambers of each side and into the aorta are guarded by valves.

If the horse is not too fat, one may feel the impact of the apex of the heart against the chest wall with each contraction of the heart by placing the hand on the left side back of the fifth rib and above the point of the elbow.

The thinner and the better bred the horse is the more distinctly this impact is felt. If the animal is excited, or if he has just been exercised, the impact is stronger than when the horse is at rest.

If the horse is weak, the impact is reduced in force.

The examination of the heart with the ear is an important matter in this connection.

Certain sounds are produced by each contraction of the normal heart. It is customary to divide these into two, and to call them the first and second sounds.

These two sounds are heard during each pulsation, and any deviation of the normal indicates some alteration in the structure or the functions of the heart.

In making this examination, one may apply the left ear over the heavy muscles of the shoulder back of the

shoulder joint, and just above the point of the elbow, or, if the sounds are not heard distinctly, the left fore leg may be drawn forward by an assistant and the right ear placed against the lower portion of the chest wall that is exposed in this manner.

The first sound of the heart occurs while the heart muscle is contracting and while the blood is being forced from the heart and the valves are rendered taut to prevent the return of the blood from the lower to the upper chambers.

The second sound follows quickly after the first and occurs during rebound of blood in the arteries, causing pressure in the aorta and tensions of the valves guarding its opening into the left ventricle.

The first sound is of a high pitch and is longer and more distinct than the second.

Under the influence of disease these sounds may be altered in various ways.

It is not profitable, in a work such as this, to describe the details of these alterations.

Those who are interested will find this subject fully discussed in the veterinary textbooks.

TEMPERATURE

The temperature of the horse is determined roughly by placing the fingers in the mouth or between the thighs or by allowing the horse to

exhale against the cheek or back of the hand.

In accurate examination, however, these means of determining temperature are not relied upon, but recourse is had to the use of the thermometer.

The thermometer used for taking the temperature of a horse is a self-registering clinical thermometer, similar to that used by physicians, but larger, being from 5 to 6 inches long.

The temperature of the animal is measured in the rectum.

The normal temperature of the horse varies somewhat under different conditions.

is higher in the young animal than in the old, and is higher in hot weather than in cold.

The weather and exercise decidedly influence the temperature physiologically.

The normal temperature varies from 99.5° to 101° F.

If the temperature rises to 102.5° the horse is said to have a low fever; if the temperature reaches 104° the fever is moderate; if it reaches 106° it is high, and above this point it is regarded as very high.

In some diseases, such as tetanus or sunstroke, the temperature goes as high as 108° or 110°.

In the ordinary infectious diseases it does not often exceed 106°.

A temperature of 107.5° and above is very dangerous and must be reduced promptly if the horse is to be saved.

THE ORGANS OF RESPIRATION

In examining this system of organs and their functions it is customary to begin by noting the frequency of the respiratory movements.

This point can be determined by observing the motions of the nostrils or of the flanks; on a cold day one can see the condensation of the moisture of the warm air as it comes from the lungs.

The normal rate of respiration for a healthy horse at rest is from 8 to 16 per minute.

The rate is faster in young animals than in old, and is increased by work, hot weather, overfilling of the stomach, pregnancy, lying upon the side, etc.

Acceleration of the respiratory rate where no physiological cause operates is due to a variety of conditions.

Among these is fever; restricted area of active lung tissue, from filling of portions of the lungs with inflammatory exudate, as in pneumonia; compression of the lungs or loss of elasticity; pain in the muscles controlling the respiratory movements; excess of carbon dioxide in the blood; and constriction of the air passages leading to the lungs.

Difficult or labored respiration is known as dyspnea. It occurs when it is difficult, for any reason, for the animal

to obtain the amount of oxygen that it requires.

This may be due to filling of the lungs, as in pneumonia; to painful movements of the chest, as in rheumatism or pleurisy; to tumors of the nose and paralysis of the throat, swellings of the throat, foreign bodies, or weakness of the respiratory passages, fluid in the chest cavity, adhesions between the lungs and chest walls, loss of elasticity of the lungs, etc.

Where the difficulty is great the accessory muscles of respiration are brought into play.

In great dyspnea the horse stands with his front feet apart, with his neck straight out, and his head extended upon his neck.

The nostrils are widely dilated, the face has an anxious expression, the eyeballs protrude, the up-and-down motion of the larynx is aggravated, the amplitude of the movement of the chest walls increased, and the flanks heave.

The expired air is of about the temperature of the body.

It contains considerable moisture, and it should come with equal force from each nostril and should not have an unpleasant odor.

If the stream of air from one nostril is stronger than from the other, there is an indication of an obstruction in a nasal chamber.

If the air possesses a bad odor, it is usually an indication of putrefaction of

a tissue or secretion in some part of the respiratory tract.

A bad odor is found where there is necrosis of the bone in the nasal passages or in chronic catarrh.

An ulcerating tumor of the nose or throat may cause the breath to have an offensive odor.

The most offensive breath occurs where there is necrosis, or gangrene, of the lungs.

In some diseases there is a discharge from the nose.

In order to determine the significance of the discharge it should be examined closely.

One should ascertain whether it comes from one or both nostrils.

If but from one nostril, it probably originates in the head. The color should be noted.

A thin, watery discharge may be composed of serum, and it occurs in the earlier stages of coryza, or nasal catarrh.

An opalescent, slightly tinted discharge is composed of mucus and indicates a little more severe irritation.

If the discharge is sticky and puslike, a deeper difficulty or more advanced irritation is indicated.

If the discharge contains flakes and clumps of more or less dried, agglutinated particles, it is probable that it originates within a cavity of the head, as the sinuses or guttural pouches.

The discharge of glanders is of a peculiar sticky nature and adheres tenaciously to the wings of the nostrils.

The discharge of pneumonia is of a somewhat red or reddish brown color and, on this account has been described as a prune-juice discharge. The discharge may contain blood.

If the blood appears as clots or as streaks in the discharge, it probably originates at some point in the upper part of the respiratory tract.

If the blood is in the form of a fine froth, it comes from the lungs.

In examining the interior of the nasal passage one should remember that the normal color of the mucous membrane is a rosy pink and that its surface is smooth.

If ulcers, nodules, swellings, or tumors are found, these indicate disease.

The ulcer that is characteristic of glanders is described fully in connection with the discussion of that disease.

Between the lower jaws there are several clusters of lymphatic glands.

These glands are so small and so soft that it is difficult to find them by feeling through the skin, but when a suppurative disease exists in the upper part of the respiratory tract these glands become swollen and easy to feel.

They may become soft and break down and discharge as abscesses; this is seen constantly in strangles.

On the other hand, they may become indurated and hard from the proliferation of connective tissue and attach themselves to the jawbone, to the tongue, or to the skin.

This is seen in chronic glanders. If the glands are swollen and tender to pressure, it indicates that the disease causing the enlargement is acute; if they are hard and insensitive, the disease causing the enlargement is chronic.

The manner in which the horse coughs is of importance in diagnosis.

The cough is a forced expiration, following immediately upon a forcible separation of the vocal cords.

The purpose of the cough is to remove some irritant substance from the respiratory passages, and it occurs when irritant gases, such as smoke, ammonia, sulphur vapor, or dust, have been inhaled.

It occurs from inhalation of cold air if the respiratory passages are sensitive from disease.

In laryngitis, bronchitis, and pneumonia, cough is very easily excited and occurs merely from accumulation of mucus and inflammatory product upon the irritated respiratory mucous membrane.

If one wishes to determine the character of the cough, it can easily be excited by pressing upon the larynx with the thumb and finger.

The larynx should be pressed from side to side and the pressure removed

the moment the horse commences to cough.

A painful cough occurs in pleurisy, also in laryngitis, bronchitis, and bronchial pneumonia.

Pain is shown by the effort the animal exerts to repress the cough.

The cough is not painful, as a rule, in the chronic diseases of the respiratory tract.

The force of the cough is considerable when it is not especially painful and when the lungs are not seriously involved.

When the lungs are so diseased that they can not be filled with a large volume of air, and in heaves, the cough is weak, as it is also in weak, debilitated animals.

If mucus or pus is coughed out, or if the cough is accompanied by a gurgling sound, it is said to be moist; it is dry when these characteristics are not present—that is, when the air in passing out passes over surface not loaded with secretion.

In the examination of the chest we resort to percussion and auscultation.

When a cask or other structure containing air is tapped upon, or percussed, a hollow sound is given forth.

If the cask contains fluid, the sound is of a dull and of quite a different character.

Similarly, the amount of air contained in the lungs can be estimated by

tapping upon, or percussing, the walls of the chest.

Percussion is practiced with the fingers alone or with the aid of a special percussion hammer and an object to strike upon known as a pleximeter.

If the fingers are used, the middle finger of the left hand should be pressed firmly against the side of the chest and should be struck with the ends of the fingers of the right hand bent at a right angle so as to form a hammer.

The percussion hammer sold by instrument makers is made of rubber or has a rubber tip, so that when the pleximeter, which is placed against the side, is struck the impact will not be accompanied by a noise.

After experience in this method of examination one can determine with a considerable degree of accuracy whether the lung contains a normal amount of air or not.

If, as in pneumonia, air has been displaced by inflammatory product occupying the air space, or if fluid collects in the lower part of the chest, the percussion sound becomes dull.

If, as in emphysema, or in pneumothorax, there is an excess of air in the chest cavity, the percussion sound becomes abnormally loud and clear.

Auscultation consists in the examination of the lungs with the ear applied closely to the chest wall.

As the air goes in and out of the lungs a certain soft sound is made which can

be heard distinctly, especially upon inspiration.

This sound is intensified by anything that accelerates the rate of respiration, such as exercise.

This soft, rustling sound is known as vesicular murmur, and wherever it is heard it signifies that the lung contains air and is functionally active.

The vesicular murmur is weakened when there is an inflammatory infiltration of the lung tissue or when the lungs are compressed by fluid in the chest cavity.

The vesicular murmur disappears when air is excluded by the accumulation, of inflammatory product, as in pneumonia, and when the lungs are compressed by fluid in the chest cavity.

The vesicular murmur becomes rough and harsh in the early stages of inflammation of the lungs, and this is often the first sign of the beginning of pneumonia.

By applying the ear over the lower part of the windpipe in front of the breastbone a somewhat harsh, blowing sound may be heard.

This is known as the bronchial murmur and is heard in normal conditions near the lower part of the trachea and to a limited extent in the anterior portions of the lungs after sharp exercise.

When the bronchial murmur is heard over other portions of the lungs, it may signify that the lungs are more or less solidified by disease and the blowing bronchial murmur is transmitted

through this solid lung to the ear from a distant part of the chest.

The bronchial murmur in an abnormal place signifies that there exists pneumonia or that the lungs are compressed by fluid in the chest cavity.

Additional sounds are heard in the lungs in some diseased conditions.

For example, when fluid collects in the air passages and the air is forced through it or is caused to pass through tubes containing secretions or pus.

Such sounds are of a gurgling or bubbling nature and are known as mucous râles.

Mucous râles are spoken of as being large or small as they are distinct or indistinct, depending upon the quantity of fluid that is present and the size of the tube in which this sound is produced.

Mucous râles occur in pneumonia after the solidified parts begin to break down at the end of the disease.

They occur in bronchitis and in tuberculosis, where there is an excess of secretion.

Sometimes a shrill sound is heard, like the note of a whistle, fife, or flute.

This is due to a dry constriction of the bronchial tubes and it is heard in chronic bronchitis and in tuberculosis.

A friction sound is heard in pleurisy.

This is due to the rubbing together of roughened surfaces, and the sound produced is similar to a dry rubbing

sound that is caused by rubbing the hands together or by rubbing upon each other two dry, rough pieces of leather.

THE EXAMINATION OF THE DIGESTIVE TRACT

The first point in connection with the examination of the organs of digestion is the appetite and the manner of taking food and drink.

A healthy animal has a good appetite.

Loss of appetite does not point to a special diseased condition, but comes from a variety of causes.

Some of these causes, indeed, may be looked upon as being physiological.

Excitement, strange surroundings, fatigue, and hot weather may all cause loss of appetite.

Where there is cerebral depression, fever, profound weakness, disorder of the stomach, or mechanical difficulty in chewing or swallowing, the appetite is diminished or destroyed.

Sometimes there is an appetite or desire to eat abnormal things, such as dirty bedding, roots of grass, soil, etc.

This desire usually comes from a chronic disturbance of nutrition.

Thirst is diminished in a good many mild diseases unaccompanied by distinct fever.

It is seen where there is great exhaustion or depression or profound brain disturbance.

Thirst is increased after profuse sweating, in diabetes, diarrhea, in fever, at the crises of infectious diseases, and when the mouth is dry and hot.

Some diseases of the mouth or throat make it difficult for the horse to chew or swallow his feed.

Where difficulty in this respect is experienced, the following named conditions should be borne in mind and carefully looked for:

- diseases of the teeth, consisting in decay, fracture, abscess formation, or overgrowth;
- inflammatory conditions, or wounds or tumors of the tongue, cheeks, or lips;
- paralysis of the muscles of chewing or swallowing; foreign bodies in upper part of the mouth between the molar teeth;
- inflammation of throat
- difficulty in swallowing is sometimes shown by the symptom known as "quidding."

Quidding consists in dropping from the mouth well-chewed and insalivated boluses of feed.

A mouthful of hay, for example, after being ground and masticated, is carried to the back part of the mouth.

The horse then finds that from tenderness of the throat, or from some other cause, swallowing is difficult or painful, and the bolus is then dropped from the mouth.

Another quantity of hay is similarly prepared, only to be dropped in turn.

Sometimes quidding is due to a painful tooth, the bolus being dropped from the mouth when the tooth is struck and during the pang that follows.

Quidding may be practiced so persistently that a considerable pile of boluses of feed accumulate in the manger or on the floor of the stall.

In pharyngitis one of the symptoms is a return through the nose of fluid that the horse attempts to swallow.

In some brain diseases, and particularly in chronic internal hydrocephalus, the horse has a most peculiar manner of swallowing and of taking feed.

A similar condition is seen in hyperemia of the brain.

In eating the horse will sink his muzzle into the grain in the feed box and eat for a while without raising the head.

Long pauses are made while the feed is in the mouth.

Sometimes the horse will eat very rapidly for a little while and then slowly; the jaws may be brought together so forcibly that the teeth gnash.

In eating hay the horse will stop at times with hay protruding from the mouth and stand stupidly, as though he has forgotten what he was about.

In examining the mouth one should first look for swellings or for evidence of abnormal conditions upon the exterior; that is, the front and sides of the face, the jaws, and about the muzzle.

By this means wounds, fractures, tumors, abscesses, and disease accompanied by eruptions about the muzzle may be detected.

The interior of the mouth is examined by holding the head up and inserting the fingers through the interdental space in such a way as to cause the mouth to open.

The mucous membrane should be clean and of a light-pink color, excepting on the back of the tongue, where the color is a yellowish gray.

As abnormalities of this region, the chief are diffuse inflammation, characterized by redness and catarrhal discharge; local inflammation, as from eruptions, ulcers, or wounds; necrosis of the lower jawbone in front of the first back tooth; and swellings.

Foreign bodies are sometimes found embedded in the mucous membrane lining of the mouth or lodged between the teeth.

The examination of the pharynx and of the esophagus is made chiefly by pressing upon the skin covering these organs in the region of the throat and along the left side of the neck in the jugular gutter.

Sometimes, when a more careful examination is necessary, an esophageal tube or probang is passed through the nose or mouth down the esophagus to the stomach.

Vomiting is an act consisting in the expulsion of all or part of the contents of the stomach through the mouth or nose.

This act is more difficult for the horse than for most of the other domestic animals, because the stomach of the horse is small and does not lie on the floor of the abdominal cavity, so that the abdominal walls in contracting do not bring pressure to bear upon it so directly and forcibly, as is the case in many other animals.

Beside this, there is a loose fold of mucous membrane at the point where the esophagus enters the stomach, and this forms a sort of valve which does not interfere with the passage of food into the stomach, but does interfere with the exit of food through the esophageal opening.

Still, vomiting is a symptom that is occasionally seen in the horse. It occurs when the stomach is very much distended with food or with gas.

Distention stretches the mucous membrane and eradicates the valvular fold referred to, and also makes it possible for more pressure to be exerted upon the stomach through the contraction of the abdominal muscles.

Since the distention to permit vomiting must be extreme, it not infrequently happens that it leads to rupture of the stomach walls.

This has caused the impression in the minds of some that vomiting can not occur in the horse without rupture of the stomach, but this is incorrect, since many horses vomit and afterwards become entirely sound.

After rupture of the stomach has occurred vomiting is impossible.

In examination of the abdomen one should remember that its size depends largely upon the breed, sex, and conformation of the animal, and also upon the manner in which the animal has been fed and the use to which it has been put.

A pendulous abdomen may be the result of an abdominal tumor or of an accumulation of fluid in the abdominal cavity; or, on the other hand, it may merely be an indication of pregnancy, or of the fact that the horse has been fed for a long time on bulky and innutritious food.

Pendulous abdomen occurring in a work horse kept on a concentrated diet is an abnormal condition.

The abdomen may increase suddenly in volume from accumulation of gas in tympanic colic.

The abdomen becomes small and the horse is said to be "tucked up" from long-continued poor appetite, as in diseases of the digestive tract and in fever.

This condition also occurs in tetanus from the contraction of the abdominal walls and in diarrhea from emptiness.

In applying the ear to the flank, on either the right or left side, certain bubbling sounds may be heard that are known as peristaltic sounds, because they are produced by peristalsis, or wormlike contraction of the intestines.

These sounds are a little louder on the right side than on the left on account of

the fact that the large intestines lie in the right flank.

Absence of peristaltic sounds is always an indication of disease, and suggests exhaustion or paralysis of the intestines.

This may occur in certain kinds of colic and is an unfavorable symptom.

Increased sounds are heard where the intestines are contracted more violently than in health, as in spasmodic colic, and also where there is an excess of fluid or gas in the intestinal canal.

The feces show, to a certain extent, the thoroughness of digestion.

They should show that the feed has been well ground, and should, in the horse, be free from offensive odor or coatings of mucus.

A coating of mucus shows intestinal catarrh.

Blood on the feces indicates severe inflammation.

Very light color and bad odor may come from inactive liver.

Parasites are sometimes in the dung.

Rectal examination consists in examination of the organs of the pelvic cavity and posterior portion of the abdominal cavity by the hand inserted into the rectum.

This examination should be attempted by a veterinarian only, and is useless except to one who has a good knowledge of the anatomy of the parts concerned.

THE EXAMINATION OF THE NERVOUS SYSTEM

The great brain, or cerebrum, is the seat of intelligence, and it contains the centers that control motion in many parts of the body.

The front portion of the brain is believed to be the region that is most important in governing the intelligence.

The central and posterior portions of the cerebrum contain the centers for the voluntary motions of the face and of the front and hind legs.

The growth of a tumor or an inflammatory change in the region of a center governing the motion of a certain part of the body has the effect of disturbing motion in that part by causing excessive contraction known as cramps, or inability of the muscles to contract, constituting the condition known as paralysis.

The nerve paths from the cerebrum, and hence from these centers to the spinal cord and thence to the muscles, pass beneath the small brain, or the cerebellum, and through the medulla oblongata to the spinal cord. Interference with these paths has the effect of disturbing motion of the parts reached by them.

If all of the paths on one side are interfered with, the result is paralysis of one side of the body.

The small brain, or cerebellum, governs the regularity, or coordination, of movements.

Disturbances of the cerebellum cause a tottering, uncertain gait.

In the medulla oblongata, which lies between the spinal cord and the cerebellum, are the centers governing the circulation and breathing.

The spinal cord carries sensory messages to the brain and motor impressions from the brain.

The anterior portions of the cord contain the motor paths, and the posterior portions of the cord contain the sensory paths.

Paralysis of a single member or a single group of muscles is known as monoplegia and results from injury to the motor center or to a nerve trunk leading to the part that is involved.

Paralysis of one-half of the body is known as hemiplegia and results from destruction or severe disturbances of the cerebral hemisphere of the opposite side of the body or from interference with nerve paths between the cerebellum, or small brain, and the spinal cord.

Paralysis of the posterior half of the body is known as paraplegia and results from derangement of the spinal cord.

If the cord is pressed upon, cut, or injured, messages can not be transmitted beyond that point, and so the posterior part becomes paralyzed.

This is seen when the back is fractured.

Abnormal mental excitement may be due to congestion of the brain or to inflammation.

The animal so afflicted becomes vicious, pays no attention to commands, cries, runs about in a circle, stamps with the feet, strikes, kicks, etc.

This condition is usually followed by a dull, stupid state, in which the animal stands with his head down, dull and irresponsive to external stimuli.

Cerebral depression also occurs in the severe febrile infectious diseases, in chronic hydrocephalus, in chronic diseases of the liver, in poisoning with a narcotic substance, and with chronic catarrh of the stomach and intestines.

Fainting is a symptom that is not often seen in horses.

When it occurs it is shown by unsteadiness of gait, tottering, and, finally, inability to stand.

The cause usually lies in a defect of the small brain, or cerebellum.

This defect may be merely in respect of the blood supply, to congestion, or to anemia, and in this case it is likely to pass away and may never return, or it may be due to some permanent cause, as a tumor or an abscess, or it may result from a hemorrhage, from a defect of the valves of the heart, or from poisoning.

Loss of consciousness is known as coma.

It is caused by hemorrhage in the brain, by profound exhaustion, or may

result from a saturation of the system with the poison of some disease.

Coma may follow upon cerebral depression, which occurs as a secondary state of inflammation of the brain.

Where the sensibility of a part is increased the condition is known as hyperesthesia, and where it is lost—that is, where there is no feeling or knowledge of pain—the condition is known as anesthesia.

The former usually accompanies some chronic disease of the spinal cord or the earlier stages of irritation of a nerve trunk.

Hyperesthesia is difficult to detect in a nervous, irritable animal, and sometimes even in a horse of less sensitive temperament.

An irritable, sensitive spot may be found surrounded by skin that is not sensitive to pressure.

This is sometimes a symptom of beginning of inflammation of the brain.

Anesthesia occurs in connection with cerebral and spinal paralysis, section of a nerve trunk leading to a part, in severe mental depression, and in narcotic poisoning.

URINARY AND SEXUAL ORGANS

In considering the examination of the urinary and sexual organs we may consider, at the beginning, a false impression that prevails to an astonishing extent.

Many horsemen are in the habit of pressings upon the back of a horse over the loins or of sliding the ends of the fingers along on either side of the median line of this region.

If the horse depresses his back it is at once said "his kidneys are weak."

Nothing could be more absurd or further from the truth.

Any healthy horse—any horse with normal sensation and with a normally flexible back—will cause it to sink when manipulated in this way.

If the kidneys are inflamed and sensitive, the back is held more rigidly and is not depressed under this pressure.

To examine the kidneys by pressure the pressure should be brought to bear over these organs.

The kidneys lie beneath the ends of the transverse processes of the vertebræ of the loins and beneath the hind-most ribs.

If the kidneys are actually inflamed and especially sensitive, pressure or light blows applied here may cause the horse to shrink.

The physical examination of the sexual and generative organs is made in large part through the rectum, and this portion of the examination should be carried out by a veterinarian only.

By this means it is possible to discover or locate cysts of the kidneys, urinary calculi in the ureters, bladder, or upper urethra, malformations, and acute inflammations accompanied by pain.

The external genital organs are swollen, discolored, or show a discharge as a result of local disease or from disease higher in the tract.

The manner of urinating is sometimes of considerable diagnostic importance.

Painful urination is shown by frequent attempts, during which but a small quantity of urine is passed; by groaning, by constrained attitude, etc.

This condition comes from inflammation of the bladder or urethra, urinary calculi (stones of the bladder or urethra), hemorrhage, tumors, bruises, etc.

The urine is retained from spasms of the muscle at the neck of the bladder, from calculi, inflammatory growths, tumors, and paralysis of the bladder.

The urine dribbles without control when the neck of the bladder is weakened or paralyzed.

This condition is seen after the bladder is weakened from long-continued retention and where there is a partial paralysis of the hind quarters.

Horses usually void urine five to seven times a day, and pass from 4 to 7 quarts.

Disease may be shown by increase in the number of voidings or of the quantity.

Frequent urination indicates an irritable or painful condition of the bladder or urethra or that the quantity is excessive.

In one form of chronic inflammation of the kidneys (interstitial nephritis) and in polyuria the quantity may be increased to 20 or 30 quarts daily.

Diminution in the quantity of urine comes from profuse sweating, diarrhea, high fever, weak heart, diseased and nonsecreting kidneys, or an obstruction to the flow.

The urine of the healthy horse is a pale or at times a slightly reddish yellow.

The color is less intense when the quantity is large, and is more intense when the quantity is diminished.

Dark-brown urine is seen in azoturia and in severe acute muscular rheumatism.

A brownish-green color is seen in jaundice.

Red color indicates admixture of blood from a bleeding point at some part of the urinary tract, usually in the kidneys.

The urine of the healthy horse is not clear and transparent.

It contains mucus, which causes it to be slightly thick and stringy, and a certain amount of undissolved carbonates, causing it to be cloudy.

A sediment collects when the urine is allowed to stand.

The urine of the horse is normally alkaline.

If it becomes acid the bodies in suspension are dissolved and the urine is made clear.

The urine may be unusually cloudy from the addition of abnormal constituents, but to determine their character a chemical or microscopic examination is necessary.

Red or reddish flakes or clumps in the urine are always abnormal, and denote a hemorrhage or suppuration in the urinary tract.

The normal specific gravity of the urine of the horse is about 1.040.

It is increased when the urine is scanty and decreased when the quantity is excessive.

Acid reaction of the urine occurs in chronic intestinal catarrh, in high fever, and during starvation.

Chemical and microscopic tests and examinations are often of great importance in diagnosis, but require special apparatus and skill.

Other points in the examination of a sick horse require more discussion than can be afforded in this connection, and require special training on the part of the examiner.

Among such points may be mentioned the examination of the organs of special sense, the examination of the blood, the microscopic examination of the secretions and excretions, bacteriological examinations of the secretions, excretions, and tissues, specific reaction tests, and diagnostic inoculation.

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