NOTES
ON
Theory and Practice of Veterinary
MEDICINE and SURGERY.

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NOTES

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THEORY AND PRACTICE

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OF *Eger* (Alexander)
compiled

VETERINARY MEDICINE

AND

SURGERY.

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THE THEORY AND PRACTICE
OF
VETERINARY MEDICINE
AND
SURGERY.

The practice of medicine is looked upon as a science and as an art. As a science it treats of the nature, existence, condition and causes of disease; as an art it is directed to the recognition, prevention and treatment of diseases; cause of diseases is the most principal. Surgery is classified in the same way.

Practice of medicine is practically experimental. Females require smaller doses than males; the smaller the animal the smaller the dose; the climate as between heat and cold also governs, a larger dose is used in summer than in winter.

MORBID ANATOMY—STRUCTURAL CHANGES PRODUCED BY DISEASE.

Disease is the opposite of health: health is the normal condition of an animal: an animal is in normal condition when the organs perform their functions regularly and rythmatically with each other.

The vital organs are the heart, lungs, abdominal viscera, etc. If one gets out of order they are not working regularly with each other.

Disease is either organic or functional: organic when unnatural changes take place in the structures; functional when there is a derangement in the function without changing the structure—for instance, the irregular pulse.

PATHOLOGY.

Pathology is the doctrine of disease. It is divided into general or special: general pathology treats of disease in general without reference to any particular disease: special refers to individual diseases.

General pathology includes:

Etiology, which treats of the cause of disease.

Semeiology, which treats of the symptoms of disease.

Pathogeny, which treats of the generation, production and development of disease.

Nosology, which treats of the classification and nomenclature.

Diagnosis, which treats of the recognition of disease

Prognosis, which treats of the probable termination.

Hygiene, which treats of the prevention of disease.

Therapeutics, which treats of the cure of disease by the use of drugs.

There are two causes of disease—predisposing, which originates within the body, and is hereditary; and exciting or extraneous, which originates outside of the body, such as overwork, bad food, bad water, exposure to extreme changes in temperature, etc.

Diseases are divided into four classes, viz: contagious or infectious, epizootic, enzootic and sporadic.

Diseases are contagious when they are communicable from one animal to another.

Epizootic affects animals without any local cause, and is not confined to any one district, but usually covers a large territory. (Grippe, influenza.)

Enzootic disease affects animals in a comparatively small district with a local cause. (Mud fever).

Sporadic diseases occur only in single or isolated cases: this covers all our common diseases not included in the first three.

Influenza is a typical example of the epizootic. (1872).

THE BLOOD.

The blood in its normal condition is the vital fluid of the body, without it no animal can live, in health the blood as seen passing through a microscope is colorless, but when outside, the arterial blood is red, and the venous blood is blue.

COMPOSITION OF THE BLOOD.

Water.....	784	parts
Corpuscles	131	"
Albumen	70	"
Extracted matter	6.77	"
Saline	6.03	"
Fibrin.....	2.2	"
Total, 1,000		

This proportion varies but little in health, but does in disease: water can be down to 700 or up to 800, without producing any material diseased condition.

Fibrin decreases during pregnancy and increases after: it can be separated from the blood by whipping with twigs, and will show a grayish white matter. Fibrin is formed instead of helping to form anything; it plays the part in the blood of thickening it so as not to allow it to ooze out of the blood vessels; in emaciated animals it is sometimes increased and sometimes decreased, when the animal dies from the want of food the Fibrin is materially increased, but when the animal dies or is emaciated by fever, the Fibrin is decreased. In all local inflammations, the Fibrin is increased causing congestion of the blood; or Hyperæmia. When Fibrin is out of the blood, the power of coagulation of the blood is diminished; in influenza and in death from suffocation, carbolic acid or ammonia, Fibrin is much decreased.

In Plethora the solid matter is increased, and there is a want of the water supply in the blood. When the blood is proportionately rich, as in diarrhœa or diabetes, the water is withheld and the proportion will be less than 784 parts.

During Anæmia or bloodless condition, Hæmagoblin or coloring matter is diminished. So in proportion to the decrease of corpuscles in the blood the water increases.

In Plethora we find everything just reversed, and is due to high feeding or on concentrated food. In this disease there is an increase in the corpuscles and a decrease in water.

Texas fever has its home in the red corpuscles and leaves the blood in an impoverished condition. This is true of any fever. We can tell

this condition of the blood by observing the color of the mucous membrane in the lining of the mouth, eyelids and nostrils.

Albumen varies considerable in many cases. In debility the quantity is comparatively small; in plethora we find an increased quantity of albumen in the corpuscles, consequently the amount of water is decreased.

Albuminuria water in cattle or where there is a dropsical condition it denotes a want of albumen in the blood.

THE PULSE.

The pulse is the most important feature to the physician and surgeon in the diagnosis of the animal.

The pulse is defined as the evidence of the circulation of the blood. We get the pulse by pressing the finger on an artery. We find that the blood passes through an artery at about the speed of ninety feet per minute.

Circulation of the blood is produced and regulated by the sympathetic nervous system. Every disease produces a greater or less irregularity of the nervous system.

The nervous system is the key: by it we can tell the condition of the animal: it is to the physician and surgeon what the compass is to the mariner. In death the nervous system is the last to die in the body.

The pulse is the means we have of measuring the circulation of the blood, the character of the beat indicates the condition of the nervous system: other means are only corroborative.

The normal beat of the horse is from 33 to 40. Occasionally the beat of the draft horse is as low as 28, and rarely as low as 25. This variation of the pulse depends upon the temperament of the animal. Exercise increases the frequency of the pulse: or, anything exciting will increase the pulse.

The horse is the most excitable of all animals, therefore, we should take the pulse a second time before arriving at a conclusion as to the condition of the animal.

The pulse of the horse is usually taken from the submaxillary artery, located near the lower jaw or from the brachial artery, in the arm near the body; also from the coccygeal artery, about three inches from the tail.

Relationship of Circulation to Respiration.

There are three and one-half beats of the heart to one respiration. The force of the pulse lies in the expansion and contraction of the heart: diastole is the expansion, and systole the contraction.

The normal pulse of the ox is from 40 to 50. On account of the thickness of the skin, and the arteries being located deep, the pulse of the ox is difficult to take; the most convenient place being the carotid artery just above the sternum.

The pulse of the sheep is from 70 to 80 taken from the brachial artery inside the arm, and the femoral, inside the thigh.

The normal pulse of the dog is from 72 to 90, according to the condition of the animal. The pulse of the dog is much similar to that of the human.

The character of the pulse is first measuring the frequency or infrequency in a given time; second, measurement of the quick or slow

pulse in a given time by each individual beat: third, the large or small pulse, this measures the dilatibility: fourth, the compressibility, hard or soft. Quick pulse is caused by the sharp sudden contraction of the heart; jerky pulse is an aggravation of the quick pulse. Slow pulse usually indicates some disease of the brain, produced by pressure.

In plethora the pulse is strong and full; in anæmia, small.

Slow pulse as seen in enteritis is due to the contraction of the muscular coating of the walls of the arteries.

In laminitis we have a hard, full pulse, and strong. This disease is often mistaken for lung diseases from the pulse.

Double pulse indicates a feeble condition of the heart.

The temperature of warm blooded animals is a mystery. No matter what the surroundings may be, as regards heat and cold, the temperature is maintained. That of cold blooded animals is the same as their surroundings in which they are living.

In case of disease we have a change in temperature. A rising in temperature indicates fever: loss of heat or lowering temperature below the normal, indicates a waning vitality.

In cases of simple fever, the temperature is in proportion to the amount of fever—a rise from 101 to 104—but in pleuropneumonia it rises to 106, and even to 107, when it is extremely dangerous. In sunstroke it rises higher than in this disease, and in hysteria still higher, when it is nearly always fatal.

We may take it as the rule, that when the temperature of an animal reaches 104 it is sick, 105 very sick, 106 and upwards dangerously, and at 108 in nearly every case fatal.

The temperature of an animal is always higher at night than in the day time.

When the temperature remains for forty-eight hours at 106 or above, as a rule it always proves fatal. In sunstroke it may run to 109, and even to 110, and if it remains so about two hours the animal will die.

THE THERMOMETER.

The use of the thermometer is to ascertain the true temperature of the animal. 100 is normal in the horse, and is taken by inserting the thermometer into the anus in males and either into the anus or vagina of mares. Always turn the instrument to one side so as to press against the sides of the bowels, and leave in about five minutes. In this way you will be sure to get the best results. Getting the temperature of animals in any other way than by the use of the thermometer is purely guess work, and are not reliable.

The temperature is even more important than the pulse, if there were any choice to be made, because it may be that in some cases the pulse may not show much change, and yet the temperature be much higher and the animal be very sick.

In severe sickness the temperature should be taken about twice a day, but in cases of less seriousness once a day will be sufficient.

The temperature of the ox is liable to great variations, more so than any other animal, according to the surroundings, changing from 101 to 103, and often when the ox has been standing in the sun for a considerable time, the temperature may often be as high as 104 and even 106 without any sickness.

NORMAL TEMPERATURE OF DIFFERENT ANIMALS.

	Ger.	Eng.		Ger.	Eng.		Ger.
Man,	98.6 to 100		Hog,	103.4	100	Fowls,	106 to 111
Horse,	99.9	100	Fox,	102.5		Dove,	109.4
Ox,	103.40	100 to 102	Ape,	100.5		Swallow,	111.2
Sheep,	103	101	Guinea Pig,	102.4		Goose	107
Dog,	102	101.5	Rabbit,	103.19			

The high temperature of fowls accounts for their exemption from specific diseases.

The temperature of animals may sometimes get as low as 78.8 and the animal live, but as low as 75 they die.

CONGESTION OR HYPERÆMIA

is an increased flowing or determination of blood to a part. There are two kinds, healthy and unhealthy. Unhealthy may be active or passive.

Healthy congestion is an increased flow of blood to an organ or to a part, as a natural physical effort to assist in its functions, for instance the flow of blood to the penis at the time of copulation, also in parturition in congestion of the mammary glands.

Active congestion is confined to the arteries and arterioles.

Passive to the veins and capillaris, the passive is sometimes spoken of as the mechanical congestion. There are two causes for active congestion: Increased blood pressure and diminished arterial resistance. The increased blood pressure is due to an obstruction in some of the arteries causing increased flow of blood to the part through a series of arteries. An instance of the danger in this may be given if a horse having become very warm from exercise is left standing in the cold rain it may cause the superficial blood vessels to contract and force the blood internally and may cause congestion of the lungs, and, if not attended to in time this will cause pneumonia, or the blood may be forced to the heart, stomach, spleen or some other organ and cause some serious disease.

The second cause of active congestion, diminished arterial resistance. This is primarily a nerve disease, caused by the temporary paralysis of a part of the vasomotor nerve system, or by diminished tonicity of this system. The effect of that is serious. The blood accumulates in the dilated part and sometimes causes a stoppage of the flow in that part, and the fact that arterial blood, if stopped for the shortest time, changes its nature, make it serious. When an artery becomes plugged the white corpuscles begin to force out of the vessel and into the surrounding cellular substance, causing soreness, etc. A sudden interruption of the flow of blood in the vessels often cause gangrene.

This forcing out of the blood vessels of the white blood corpuscles and other substances is called transudation.

Passive congestion is sometimes called the chemical congestion, and of itself is confined to the veins and capillaris. The smallest kind of this is produced by tying a string or bandage tightly around a part, thus causing congestion by mechanical means. The commonest cause of passive congestion is the forming of the clot or thrombus in the vein: the disease from this is called thrombosis. Sometimes we get a thrombosis in the arteries, and this passing on to a small part of the vessel causes a plugging of it, called embolus, producing embolism.

There are four more complicated conditions of passive congestion, first is diminished cardiac power, or diminished heart force, as seen in late cases of debilitating diseases. The heart becomes weak and the circulation correspondingly weak: the pulse becomes intermitting and irregular, this permits the forming of the ante mortem clot. This often causes congestion of the lungs through diminished cardiac power.

Second, that of gravitation. This cannot occur except as the result of some other cause, as seen in puerperal fever.

Third, altered condition of the blood, as seen in certain special cases such as black leg in cattle or sheep, also in anthrax. Defective secretion is also a very common cause.

Fourth, defective nutrition, as seen in the inactivity of the kidneys, liver, bowels, and sometimes the skin. These organs become torpid in their action through overwork or other causes. In the kidneys there may be a retention of the urine causing urinary troubles, and in the bowels causing constipation.

The results of active congestion are redness, heat, throbbing of the affected parts, then as a local condition we find that the arteolas are enlarged, and a tendency to thickening of the walls, and if continued any length of time there is an altered function, especially to the near nerve center. After the congestion has been in existence for a few hours extravasation may take place into the cavities of serum or from a rupture of the capillaris, or an exudation of the watery portion of the blood into the surrounding tissue. If the capillaris are ruptured, or exudation takes place, then also extravasation, also there is a tendency to coagulate

Petechia is where the extravasation takes place in minute spots.

Ecchymosis where it takes places in large places. Petechia are about the size of a pin head; ecchymosis as large as the palm of the hand.

Result of passive congestion. We find a tendency from the blood or transudation of serum, this flows into the cellular tissues and forms dropsical conditions: when it flows into cavities there are special names applied. This condition of passive congestion does not tend to coagulation, while the exudation of active congestion does, because it contains more albumen and usually more of the coloring matter of the blood. Active congestion in connection with extravasation we have two kinds of: hemorrhage—hemorrhage by rheres and hemorrhage by diapedesis. Hemorrhage by diapedesis is where the blood oozes through the blood vessels. Active congestion often terminates in gangrene: that is death to the part and often to the animal, this being due to the obstruction of the circulation,

Passive congestion of itself never causes death.

IRRITATION.

Irritation is a disturbance produced by an irritant: that is, anything that produces first, a local disturbance, and then, if severe and long continued produces a constitutional disturbance. Irritation causes congestion, and if continued, runs into inflammation. The effect of inflammation may not be necessarily local, but may be carried through the body. This is called reflex action, and is carried through the sympathetic nerve system.

Constitutional effects of irritation are largely produced by pain, and pain is the local effect of irritation on the nervous system. An example

of constitutional disturbance is worms in the intestines, causing the animal to get hide bound, staring coat, pot bellied and ill-natured. In dogs, worms generally cause fits.

The topical effects of local irritation are pain, heat, swelling, tension and redness. Pain is due to the wounding of the nerve.

Heat is produced by increased determination of the blood to the part.

INFLAMMATION.

Inflammation is derived from the Latin word *Inflammatio*, and means *I burn*. An altered condition of nutrition of a part, usually congestion, and causes a dilation of the arteries and arterioles, then, as a result of this you get a plastic condition of the blood in the affected parts. This is the first important condition of the inflammation the red corpuscles creep together, adhere to the walls of the vessels and interrupt the flow of blood, and after this is caused, exudation sets in: at the time this is taking place white blood corpuscles pass out of the blood vessels, and with the serum causes a local inflammation, fibrin increases very materially and rapidly, and this has the effect of causing coagulation of the material that passes out of the blood.

The process of inflammation first starts as a cause of the application of an irritant. This upsets to a greater or less extent the nervous system, and so alters the tonicity of the blood vessels and allows them to dilate. This causes congestion, and this has a tendency to make the blood thick with more or less clogging of the blood vessels: the red corpuscles gather, and the plastic matter and the white corpuscles exude into the surrounding tissue. Those exudites are serum lymph and a glutenous matter.

The topical results are pain, swelling, heat, redness, tension and soreness.

The results of inflammation are variable. First resolution is when the inflammatory process stops short and the matter is absorbed, leaving behind no trace of the inflammation.

Second, effusion which means pouring out into the tissues or cavities of serum. Serum is the product of inflammation; it is the more watery portion of the blood, having but little albumen or fibrin in it.

Dry stage is the first stage; that is when the part is hot, dry and tense. After this lasts from three to thirty hours then comes the second, or wet stage. This always follows the first.

Suppuration is the third stage. This is the stage in which we get the formation of pus. Induration and hardening of the exude in suppuration often forms permanent tumors which often stay with the animal during life. Neoplasm is a formation of new tissue. The new tissue is produced by the increase in cells. This neoplastic tissue, along with the exudite, becomes permanent tumor.

Neoplasm is usually white fibrous tissue. We often find new blood vessels formed in this new cell tissue.

Adhesion. This is the direct result of inflammation, as the word indicates, two parts growing together. This follows suppuration.

Gangrene. This is the last and fatal termination of inflammation. Gangrene and necrosis usually mean the same thing, though there is a difference: gangrene is the death of a large part, necrosis the death of a part of a tissue or of a bone.

Ulceration in the soft tissues is molecular death; in the bone, necrosis: in a large part is gangrene.

In inflammatory process the local activity is either increased or decreased, that is, of the part involved: usually in the earlier stage it is increased, in the second diminished.

The function of an organ may be entirely destroyed by inflammation.

Pus is the result of suppuration: liquor puris is the fluid, and pus cells is the solid pus. Some scientists recognize pus germ as the cause of the formation of pus, but in the case of deep tumors there must be a disturbance of the circulation of the blood to the part, and so alters its functions, bringing on inflammation and the disorganization of the organs, the breaking down cells becoming decomposed and liquified.

Laudable or healthy pus is thick, creamy and usually colorless, that is, it has no offensive odor, mawkish to the taste, and has no tendency to putrify, but rather to dry up. It is putrid pus when it comes from an abscess, this is due to the necrosis of the part involved.

It is sanious when it is bloody pus.

Sanies is pus flowing from an abscess, and is particularly offensive and streaked with blood; this is due to the presence of decomposing animal matter flowing into it.

Specific pus comes from specific diseases.

Pus is ichoris when it scalds the part it flows over.

Gangrene occurs in two forms; the moist and the dry: the moist is caused by the sudden shutting off of the circulation, and of course shutting off the nutrition. As soon as death occurs decomposition sets in. the part turns black and the red line of demarkation is plainly visible between the dead and the living tissue: dry gangrene occurs from a slowly interrupted circulation, in which case the part dies from lack of nutrition, the part becomes dried up and chalky, pale and mummifies.

Death is the cessation of life, and after death the body decomposes. Nature abhors death, and resists it to the last. The nerves are the last part of the body to die. All the lower animals show on their countenance the fear of approaching death.

In the subject of death we divide the body into three separate vital functions.

First, the circulatory system; this includes the heart and all the blood vessels, as through these organs nutrition is carried to all parts of the body for its nourishment. We find where a clot has formed and has lodged in some of the arteries the effect of it is almost instantaneous, producing coma and death.

Second, the pneumatic apparatus, the lungs and the air passages, this being used to supply the blood with oxygen, and to carry away the carbonic acid gas, thereby purifying the blood.

Third, the controlling power over these two systems: we have the nervous system: its main benefit is in its irritability and sensibility. The nerves carry the idea of life, being the propelling, and at the same time the controlling power or governor.

Syncope is sudden death beginning at the heart. When it occurs from syncope there are no premonitory symptoms. Sometimes, in some cases, syncope occurs without any known cause; the heart simply loses its irritability. In such cases the heart will be found to be large and full.

When an animal dies from tonic spasm of the heart, then, in autopsy, you will find the heart small, hard, contracted and empty.

Asthenia is slow death, beginning in the heart. In asthenia there are premonitory symptoms, for instance: in organic diseases of the heart we get symptoms of the approach of death. In death from asthenia neither of the two extremes exist that we find in syncope. After death the heart is often found full and soft.

Shock is where sudden death occurs from a fall or great fear.

Hemorrhage. Death from this occurs more or less sudden, according to the size of the vessel ruptured. In case of internal hemorrhage the animal often dies from bleeding, when there is no trace of blood to be seen, because it flows into the abdominal cavity.

We find in approaching death the most important symptoms are invariably the gradually increasing pallor of the mucous membrane as the blood flows and the animal suffers, the extremities grow cold, and finally the whole surface of the body, that is when death is comparatively slow. But in sudden deaths these symptoms do not occur. Also in death by slow hemorrhage the mouth grows cold as death approaches and there is a cold clammy sweat exuding from the body, the eyes become dim and staring and insensible. If the animal is down and unable to rise there will be convulsive struggles. When death occurs in the breathing apparatus it may occur in any of the parts from the nostrils to the lungs.

Dyspnoea is inability to breathe, and because of the absence of oxygen nutrition is suspended.

Third, death beginning in the brain, spoken of as coma, or stupor. In death from the brain a comatose condition is always developed before death. The nerves presiding over the vital organs have their origin in the floor of the fourth ventricle. The best way to produce death is by the brain so as to reach the fourth ventricle.

Some pathologists recognize a fourth:—

Necromia is death beginning in the blood: that is due to blood poisoning or septæmia, caused by a germ getting into the blood as in anthrax and purpural-hæmorrhagica. This germ gets into the red corpuscles and destroys them. In death by necromia the body decomposes very fast.

The horse will stand till the last; but cattle, sheep and dogs will lie down, sometimes for weeks before death occurs.

Nosology—the classification of disease is best based upon the character of the organ involved. Diseases are of two kinds: constitutional and local.

Constitutional are those which affect the whole system, primarily, and if they locate in any particular organ they do so secondarily: for instance, in glanders, blood poisoning is secondary in the lungs and nose, producing pneumonia. The constitutional diseases are often spoken of as blood diseases. Constitutional diseases are of two kinds: exogenous and endogenous.

Exogenous are those arising from external influences, or from without.

Endogenous are those arising within the body, due to some contagious disease: those of an epizootic or enzootic nature belong to the exogenous.

Hereditary diseases are classed as endogenous, also such cases as rheumatism or those influences inducing them, and arise in the body.

To the local belong all the sporadic diseases, and comprise all those we might get in everyday practice, which do not come under the head of constitutional.

We classify diseases according to Robertson and Williams as follows.

- First, of the respiratory system.
- Second, of the digestive apparatus.
- Third, circulatory, that is, heart and blood vessels.
- Fourth, urinary apparatus, as kidneys.
- Fifth, brain—nervous system.
- Sixth, reproductive—generative organs.
- Seventh, locomotory apparatus.
- Eighth, cutaneous, or skin diseases.

Diseases should be treated rationally, sensibly and scientifically, that is, treated according to the requirements or conditions.

A term used in medicine is *vis medicatrix natura*, that is, the power nature has to restore or repair her own damage, so all the doctor can do is to give nature a chance by assisting her.

Diseases are divided into acute, sub-acute and chronic:

Acute diseases are those that develop suddenly and severely, run a rapid course and usually are of short duration, and are inclined to terminate fatally. Acute sometimes subdue, then come on again, and run into chronic.

Sub-acute are those that come on more slowly, are less severe, and are inclined to terminate favorably.

Chronic cases are of long duration. In this there may be deposits in some part which become permanent enlargements, and generally come from acute or sub-acute. They cannot be cured quickly.

Acute requires as a class prompt, heroic and vigorous treatment. Sub-acute do not require so severe treatment, but milder and smaller doses. In chronic, the treatment requires to be strong sometimes, but applied more slowly than in either of the other two cases.

There is a term in the treatment of inflammatory diseases referred to as antiphlogistic, that is applied to the cooling of the fever. This is practiced in nearly all inflammatory diseases.

Ephemeral fever is a simple febrile condition, and has its origin or existence due to some internal influence: no special organs are involved, and there is no specific disordered conditions.

Etiology.—Overwork and excessive fatigue, exhaustion, exposure to wet and cold and bad food, etc.

Semeiology.—This fever comes on more or less suddenly. The symptoms usually commence by rigor, shivering; but in very mild cases this rigor may not be perceptible, only showing a staring coat. In this rigor the nose, ears and limbs are cold, the breathing is increased in frequency and more or less noisy, a sort of feeble roar. We can often tell the presence of chill by this roaring. When the plainer effects are passed the nostrils are not much dilated, rather inclined to be flat. As a rule we never get this sort of breathing in any other case. While this chill is going on there is a congestion of blood to the internal organs: the nervous system is disturbed, particularly the sympathetic system, causing the temperature to rise. In a moderate chill you will find the temperature to run to 104 and 105, in severe cases to 106.

The pulse will run up from 50 to 70 during the chill. A characteristic of the pulse, in addition to its frequency, is it is quite hard in comparison to its normal beat, strong though small.

In the course of ordinary events the rigor will subside, and the warmth will return. In some excessively severe cases the legs of horses have been known to remain cold ever after during life.

After the chill subsides, if the fever remains, nervous prostration results, produced first, by the chill, second by the disease. If the fever be high there will be loss of appetite as a rule: if the fever is as high as say 104 after it has run forty-eight hours there is an alteration in the fæces, which is increased and covered with a sort of slime, the urine is high colored and scanty, and there is great lassitude, and the mucous membranes become injected and thirst increases; ordinarily the fever will subside of its own accord.

Prognosis, is your opinion as to the probable termination of the disease, so never be ready to give a definite prognosis or you may be deceived and your reputation injured just so much.

Treatment of ephemeral fever:—The chill is the first thing to bear in mind, and there is also a sudden elevation of temperature, the pulse is rapid, hard, the surface of the body is cold, but the temperature taken from the rectum shows an elevation in temperature. Stimulants are what is now needed, given to increase the force of the beats of the heart and increase the circulation. In chill we find it best to combine a stimulant and a sedative, as whisky and aconite: the whisky stimulates the action of the heart, and has a tendency to increase or produce an increase of the blood flowing to the surface, and aconite in moderate doses allays the irritability of the heart, and by the use of these two drugs we get a return of the pulse to its normal condition. The aconite has no effect, that is, no bad effect, if given in small doses and if given frequently, and if given in sufficient quantities will give a diathretic result. Sweet spirits of nitre is also a good stimulant, also carbonate of the aromatic spirits of ammonia. As a rule we generally rely on whisky: in regard to the dose we give, horse, half-pint whisky and 2 oz. each subsequent dose, that is, with the aconite, say about seven to ten drops, repeat every ten minutes or every fifteen, but not oftener than every ten. In addition to the treatment hygiene plays an important part. Pile on four or five blankets and robes, put men at the neck and legs and make them rub well (the rubbing at the neck to be always downward) continue the rubbing and applying the medicine for two hours, or till the chill subsides. The chill should be stopped as quickly as possible, as the shorter the chill can be cut, the quicker the horse will be cured.

Say we take 108 for the temperature of the horse. There is a term we call anti-phlogistic, and as we said before, is applied to a cooling off of the heat. As regards the fever, various schools have various ways of doing this, so have various practitioners, but the first is: nature has a power to repair her own damages. Remove the cause of the fever and nature will do the rest. The character of the pulse is the most important thing you want to note in examining a fever patient.

The mixture we use is as follows:

R	Aconite fl. ex.	1 dr.
	Belladonna fl. ex.	2 dr.
	Gentian Rad. fl. ex.	1 oz.
	Ether Nit. sps.	2 oz.
	Ammon. Chl.	1 oz.
	Potass. Nit.	$\frac{1}{2}$ oz.
	Aqua, ad.	Q S 16 oz.

Give a two-ounce dose every hour for the first five or six then every two hours till the fever subsides, or every hour until the temperature reaches 104, then every two hours till it reaches 102, then three times a day until it is normal.

If a severe fever remains with the horse for thirty-six hours a more or less serious inflammation is sure to result; that is why we should try to stop the chill as quickly as possible. If the chill is of short duration and there are no serious complications in inflammation we should be able to stop it in a short time, but you want to remember it is an important point to bear in mind not to reduce a fever too quickly, otherwise you may cause serious nervous prostration. That is why we prescribe small doses. The following is the mixture recommended by prof. Robertson.

R	Potass. Chlor. or Nit.	3 drs.
	Sps. Ether Nit.	1 oz.
	Liq. Ammon. Acet.	4 oz.
	Aqua ad.	Q S one pint

Give as a drink all in one dose, repeat two or three times a day. If given only twice a day, give in addition four to six drs. of the nit. or chlor. of potash in the drinking water twice a day. Large doses are liable to give a shock so we recommend small doses often repeated. We believe we get better results by giving smaller doses and often than to give large doses and less frequent, as is recommended in the old country; this is particularly true when considering canine practice, because dogs are more susceptible to drugs than most other animals, especially to poisons. There is very little danger of giving too small doses or under dosing; there is greater danger of over dosing; for instance, the animal requires a purgative, you give him a dose, and nature does not respond soon, then you give him another dose in a short time, the first dose begins to work, and then the second dose comes on also to act; the chances are that as a result suppuration sets in and likely there will be a dead horse.

Antipyrin may be given in fever, but always remember to give a stimulant with it, and give close attention that there is no danger from heart failure; this is why the stimulant is recommended, as it strengthens the heart's action. Remember, that when the fever is diminished to stop the medicine, for if you continue you may only cause heart or kidney complications to arise. Sulphate of iron is a good tonic to give, also the vegetable drugs, gentian and nux.

Hygiene.—In the first place never confine a sick horse, give him a loose stall and plenty of nice, clean bedding; straw and a little sawdust make a good bed. It is a good idea to bandage the legs with flannels, it helps to maintain the temperature, water the patient, say two quarts every ten or fifteen minutes until his thirst is quenched, then place a bucket before him and let him drink as much as he will, for water is a good thing in case of fever.

The food should be soft and easily digested. Slop bran is good, and after a few days you may add a little oats, mixing with hot water, as this softens and rather cooks the oats. Do not give any dry food. Often the horse will go four or five days without eating, then find out what he might fancy and give it to him often. He will like to nibble on the ear corn, give him about three ears at a time, but no more. Remember that in fever if you give too much food it may cause vomiting, especially if you feed too much carrots, never give more than one or two of them at a time, then after a few hours give a few more. Always give plenty of fresh air, but arrange your ventilation so there will be no draft, but will circulate around without coming in direct contact with the horse from without. All fever patients require perfect rest, so do not exercise at all so long as the fever lasts; during convalescence give him gentle exercise. In the start of fever give a liberal amount of clothing and take off, little by little, as he recovers until entirely well.

The rule now is, and especially in this climate, not to give a laxative, but let the bowels relieve themselves, but if you do give one, let it be a small dose of sulphate of soda, or a small dose of linseed oil.

Breathing apparatus.—In every case there are certain phenomena. The physical signs are to be observed through means of examination. These methods are, first, inspection; second, mensuration; third, palpation; fourth, auscultation; fifth, percussion; sixth succussion.

Inspection means all that we can take in with the eye, taking in the general condition: first, in the movement of the chest, the abdominal muscles, particularly those of the flank, position of elbow, position of the feet and of the head, expression of the countenance, extent of the dilation of the nostrils, and see if there is any discharge from the nose, and if so, its character, and appearance of the coat.

Mensuration is little used in veterinary, but is in human practice. The process is measuring the chest to ascertain the expansion and contraction, and to make a comparison one side with the other.

Palpation is anything that can be felt, for instance, we feel of the surface to see if it is hot or cold, at the same time we can tell the condition of the hair, whether it is coarse; rough coat also tells as to the soreness, or by pushing the animal we can judge of the power of resistance he has left, we also get the surface temperament of the body, and we can judge of the impulse given the body by the act of breathing. We also take the pulse by touch.

Auscultation, that is by the application of the ear to ascertain whether sounds are natural or unnatural, particularly in the chest diseases. The stethoscope is an instrument used to get the sounds, and it makes the sound much louder than the natural. They are not much used in our practice but are in the physician's practice. Where there is dirty surface to apply the ear to, veterinarians usually lay a handkerchief on such a surface, then apply the ear, as it is generally believed that a surer opinion can be formed than with the instrument. But, in case you use the stethoscope be sure to always make allowance for the friction sounds.

Percussion is the act of tapping or striking the surface of the body at the point to be examined, this is done to get the density of the afflicted parts. This is very important, especially in examination of the chest. In hydrothorax we get a dull solid sound, indicating great

density where it should be drum-like. If the chest sounds drum-like it indicates a healthy condition in that respect. In chronic catarrh we get a solid sound.

Succussion is the means by which we find out the soreness in the smaller animals by grasping them with both hands and shaking them. This is only possible in the small animals.

There are some phenomena of diseases of the respiratory system, they are, grunting, coughing, dyspnœa, roaring, whistling, mucous rales, crepitation, friction, sneezing snoring and wheezing

The grunt may indicate either acute or chronic diseases of the chest. If associated with acute disease it indicates soreness; a painful condition is in acute pleurisy. In the horse the grunt sometimes indicates heaves, and when it is in acute the grunt always comes at the end of the expiration. If the grunt comes when struck at, it is generally chronic; as an example of the last is chronic disease of the larynx. In acute pneumonia moving the horse and bringing out a grunt is a sure sign he has developed pneumonia, in cattle we must make allowance for they often grunt like man when there is nothing wrong with them, we find them grunt in abdominal troubles as well as those of the chest.

Coughing is produced by a deep inspiration followed by a forced expiration usually produced by an irritation. There are two kinds, moist and dry: moist indicates the effusive stage and is in the acute; dry is in the chronic. It is dry in the first stage of bronchitis; in the more acute it may be either moist or dry.

Dyspnœa is difficult breathing under all conditions. We find it is due to the accumulation of mucous, blood or pus. Hydrothorax is caused by an accumulation of mucous, blood, pus or such in the throat; mucous ravel is the passage of air through some such as this mucous, pus or blood.

Roaring and whistling are both diseases of the throat, produced, as roaring is, by paralysis of the left recurrent nerve, and the arytenoid muscle falling into the passage of the arytenoid cartilage.

Crepitation is the crackling sound heard in the early stage of pneumonia. This sound is similar to the sound caused by rubbing sheep skins together. This crepitation is caused by drying of the parts in the inflammation.

Friction is in the early stage of pleurisy.

Sneezing of the lower animals is no indication of disease. In the human their sneeze is generally the same in health as in disease, and they sneeze generally to expel some foreign substance from the nostrils; but in catarrh they sneeze a great deal; the mucous on the surface causes a tickling and they sneeze. This is seen in the case of glanders. You can tell the stall an afflicted horse has been in by the amount of filthy looking mucous around.

Snoring may be connected with disease or health, and so does not indicate disease, though in catarrh the snore is increased. Jersey cows being finely inbred are more nervous in their breathing, and they snore, and their snore is often very loud. In horses, the snore is sometimes produced by hazy abscesses in the nose.

Wheezing usually indicates chronic bronchitis in horses, though it is sometimes heard in broken horses. It is due to the chronic thickening of the membrane of the bronchial passage.

CATARRH, in the abstract, we mean catarrhal discharge from the mucous membrane or surface, and is applicable to any mucous surface, for instance, catarrh of the bowels, influenza, cholera or catarrh of the kidneys, and especially in scarlet fever. Generally, we refer to catarrh as it applies to the membrane of the sinuses of the head and posterior nares, this is called the Schneiderian membrane.

There are three kinds of catarrh: acute, sub-acute and chronic. When it affects the Schneiderian membrane or lining in the turbinated bones it affects the trachea and large bronchii, and in very acute cases extends to the lungs. In very acute or sthenic cases we find the eyelids swell considerable, as seen in pink eye. With sthenic cases there is more or less fever; in sub-acute, or asthenic there is seldom any fever. In the sthenic form there is a tendency to run down into the lungs. The horse is particularly susceptible to acute catarrh running down into his lungs from the throat.

Etiology.—Exposure to raw, cold winds when the horse is exhausted or overheated from exertion and is perspiring freely. When the animal is a little out of health he is more susceptible than at any other time. About the first symptom of catarrh is sneezing, shaking of the head, which indicates some pain, and then in a short time the mucous membranes become red; runs then into the dry stage first, then the wet, that is, during effusion. During the wet there is a great discharge from the nose; this discharge is at first watery and thin, and gradually becomes more mucous and starchy. In the sthenic form it runs quite rapidly, that is, it produces a muco purulent discharge, and is often very profuse and filthy, it is partly starchy and partly of a greenish yellow color, as a rule has no odor, while the chronic is usually very offensive. This discharge of the acute is very light, and can often be seen floating on the water when the horse drinks. We never get a purulent discharge from the sthenic but do from the chronic, and as it runs along it becomes more and more purulent and less mucous. In the early stages of the acute the temperature rises, and the pulse will be from 44 to 60, but the amount of fever depends upon the amount of surface involved. If the throat is involved the animal is liable to have a cough, when the eyelids swell they will subside as the fever subsides. In the acute you will find often a mucous accumulation in the corner of the eyes and the submaxillary lymphatic glands often are swollen.

Prognosis, it is favorable usually, seldom ever fatal that is, if you can confine it to the throat, and not let it run to the lungs, and even then it need not be considered necessarily dangerous. When the mucous follicles in the membrane become inflamed it is at first stimulated, then temporarily suspended, then comes on the wet stage, when it again becomes stimulated, shortly followed by a mucous discharge and supuration. The temperature in catarrh is usually 104, pulse 60.

Treatment of the acute—First thing to do is to look after the hygiene then give a mild stimulant combined with a heart sedative, as there is a little of heart irritation we give a little nitrate or acetate of potash or something cooling, locally, the application of chlorate of potash is good, especially if the throat is involved, medicated steaming is good in some cases, medicate the water with carbolic acid, iodine, etc., do this two or three times a day, this is seldom done except in severe cases, and some-

times instead, the nasal douche is given. In giving the douche use a mild solution of chlorate potash, aqua solution of iodine, common salts, borax, etc. A good nasal douch is: 1% solution of common salt, $\frac{1}{2}$ % solution of carbolic acid, 2% solution of boracic acid, equal parts. Use nasal douch if discharge does not stop in the course of ten days.

For the treatment of the cough use camphor, belladonna, glycyrrhiza. I find in many cases that counter irritants are good, the following is sometimes used: R Aqua ammon., ol. terebinth, ol. lini., equal parts. We usually leave out the ammonia, this last recipe is to be applied externally on the surface of the face, rub in well the first time, but if you have to apply again, rub gently or it will take off the hair and blister, it is best to apply it hot.

During convalescence you can dry up the discharge by giving iron tonic internally, and to prevent it running into chronic, you can give it either in Tinct. or in Sulph., this iron is usually given two or three times a day for a week or ten days.

In sub acute, which is mild, you can give the same treatment as in the acute, but in a milder form.

Chronic this disease is sometimes spoken of as ozena, old authorities called it nasal gleet. Chronic is developed as a sequel to the acute and especially where the acute is neglected.

Phenominas of chronic catarrh are quite characteristic, in the first place there is no fever and the temperature is normal, in the second there is an intermittant discharge, this is a well marked sign of chronic, at times the pus dries, then again it is running freely, this may be due to its getting lodged in the sinuses for a time, then a fresh discharge causes it to run again, and if long lodged in those sinuses it will be very offensive, and this character of chronic catarrh has often made persons mistake it for a case of glanders. This discharge in addition to being offensive often comes in chunks. In chronic sometimes necrosis of the turbinated bones occur. Acute is usually seen in both nostrils, sometimes only one, in sub acute generally in one, in chronic always in one. In chronic the bones of the face bulge on account of the bone becoming thin and the sinuses being filled, and sometimes the nerves on the side affected are paralyzed and the muscles become twisted off to one side. Give soft feed, gentle work.

LARYNGITIS.

An inflammation of the mucous lining in the larynx. When it extends to the pharynx it is called laryngo pharyngitis.

Pathology.—We get sometimes in the excessive wet stage extensive edema, in which the tumefaction is so great as to materially interfere with the respiration; occasionally edema seems to confine itself to particular parts, this is the rima glottidis. When the arytenoid cartilages are affected and there is a sudden closing of the throat, it is called edema glottidis, this is the pathological condition when death takes place suddenly as in asphyxiation, the mucus forms very quickly and often chokes the animal. As a result of the inflammation around the larynx we often find a diphtheric condition, but this is not diphtheria.

In sphacelation the tissue sloughs off, and this part that sloughs off is called sphacelation, is in the latter stage of acute laryngitis. This

diphtheric condition often extends forward more or less through the trachea, and as a result of this condition the animal usually dies after four, five, or six weeks in spite of all you do, they usually die from exhaustion or blood poisoning.

Etiology.—The causes are about the same as that producing acute catarrh. We find the most common cause is the placing of horses in cold brick or stone stables after they have worked hard all day, and are heated and exhausted, it sometimes comes with a chill during the night in such cases.

Semeiology.—There is always more or less constitutional disturbances and high fever, rapid, full, strong pulse, jerking up of the head, poking his nose out, inability to swallow and if he can swallow it is painful, sometimes swelling is very rapid in the throat, sometimes when the horse swallows or tries to, the whole of it runs out of the nose, this discharge or flow is principally saliva, which accumulates very rapidly in the mouth due to the inflammation in the throat, which is so close to the carotid glands. There is an increased quantity of blood to the part and more heat, so the glands become stimulated, and so the flow of saliva increases. This flow of saliva is sometimes so great that it can be seen on the floor of the stall. The breathing in all such cases is more or less labored, and in severe cases there is a wheezing, and before death there is a sort of roaring sound. As dyspnoea increases the eyes begin to bulge, the breathing more rapid, tears flow down the cheeks and finally the pulse becomes weaker and weaker and more rapid and at last the animal drops and dies asphyxiated.

Prognosis.—If the severer signs are present and have run a long time, and swelling is very great, and inability to swallow has been for five or six days, or where there is much sloughing off or gangrene set in, you should be guarded, as this is unfavorable.

Treatment in this case should be prompt and vigorous and not long delayed on account of the rapid swelling that often occurs in this case through oedema. Steaming is good for about $\frac{1}{2}$ an hour at a time, and medicate your water with carbolic acid or iodine, and it is well to put on a poultice, we use mustard, and renew every six hours. For internal treatment, if they can swallow, give belladonna glycyrrhiza, hemp and hydrastis canadensis, the best way to apply this last, is in the powder in the form of an electuary. Camphor is a special anodyne for the throat, allaying irritation and soreness. In making your poultice see that they are well on the sides as well as on the front of the throat. Small doses of aconite are good, not to affect the heart, but locally as a relief to the throat, two or three drops at a time makes a good anodyne. It is well to give with it such as nitric ether, sulph. ether, etc. These stimulants should not be omitted. Chlorate potash may be given every hour or two. In very mild cases tinct. iron 1 oz., chlor. potash $\frac{1}{2}$ oz., makes a very nice gargle if given in the start of the trouble, also may be applied during convalescence from severe cases. Never force a horse to hold up his head to take medicine when suffering from these troubles, as it is painful and harder for him to swallow, keep drinking water before him all the time, as he will be thirsty and cannot drink much. You can also apply the following ammoniacal liniment: Aqua ammonia 1 oz., ol. terebinth 1 oz., ol. lini 2 oz., mix and apply to throat around base of ear

on a space about four inches wide. In case you find the dyspnoea very bad and dangerous don't put off using the tracheotomy tubes. Cut about six inches below the larynx and in the center of the throat a cut about two inches long, then cut a section from the cartilage, a round piece about the size that your tube will fit in nicely, cut it from two sections of the cartilage, the tube should be cleaned twice each day.

Subacute laryngitis is usually very easily handled, and the same treatment as for the acute, though in a milder form will do.

Chronic in this we have to diagnose all the chronic cases of the throat including wheezing, roaring, etc.

Etiology.—The most common cause is the acute, which the chronic follows on account of the organization of the exudates and on account of neglect or improper treatment during the acute stage, and often this is followed by some incurable trouble that remains with the animal as long as he lives. Chronic often follows long continued anæmia, indigestion, worms, these produce a chronic cough. Decayed and irregular teeth operating as they do cause indigestion by inability to masticate properly, in most of these cases, especially in those troubles that follow acute there is a chronic thickening of the lining of the larynx, and is liable to remain so during life. Under the head of chronic we may class all the conditions under which we get noisy breathing, particularly roaring. Roaring is a loud hollow sound heard when the muscles are paralyzed on the left side of the larynx, some cases may be so acute as to cause the disease causing roaring and to choke down the horse. It is claimed by some that roaring may be hereditary.

Special pathology.—The larynx is composed of five cartilaginous muscles, two arytenoids, one thyroid and two cricoid, one being the cricoideus posticus. In roaring the muscles controlling the arytenoid cartilages are paralyzed and the vocal cord drops down, we trace this paralysis to the nerve becoming paralyzed that is generally the left recurrent laryngeal nerve as given off from the pneumogastric nerve. The five muscles mentioned are red in health, in disease in this case of paralysis there is a fatty degeneration and gets quite yellow. Roaring is only heard during inspiration. In severe cases there is often a chronic cough, and this cough can be called out by pretending to strike on the ribs or throat. This roaring is sometimes intermittent in the early stages, and the best way to find out a roarer is to run him yourself. Abscess in the false nostril often causes roaring, other causes are: Constrictions of the trachea, distortion of the same and of the larynx, produced by accidents, such as a kick from an other horse.

Treatment is as a rule very unsatisfactory, the first thing to do is to ascertain the cause, if caused by paralysis of the nerve no internal or external treatment will do any good.

Arytenectomy is practiced with some success as follows: First thing lay your horse down, then administer chloroform, then turn him on his back, wash the throat thoroughly, then make your incision immediately underneath the larynx, making a slit three or four inches long, then insert the tracheotomy tube, and also fix a dam so as to prevent the blood from running down into the throat, then hold open the sides of the incision and you can see the working of the arytenoid cartilage, and you can tell the affected cord by it being relaxed and not working, so there is no need of ever making a mistake as to the one affected, now cut out the

affected arytenoid cartilage, if possible down to the articulation with the hyoid bone. There is only one artery that you will sever so there is not much danger of hemorrhage. Always use cold water to stop the hemorrhage, be sure it is pure. After removing the cartilage give antiseptic dressing, iodoform and tannic acid combined are good. It is best to leave the cut open so as to allow any food that may go down the trachea to escape, especially water, which is sure to run out while drinking. After first treatment use a hollow powder blower to get your antiseptic dressing on. Give nothing to eat for the first twenty-four hours, then soft food for three or four days, then your hay.

Fees.—We charge \$100, \$50 down and the balance when cured.

WHISTLING is recognized as being of two kinds, dry and moist. They are both produced by the air passing through the tubes contracted, that is the air passages. When these passages are wet we have the moist stage, and when they are dry, the dry whistling. In acute cases, as diphtheria, the whistle is moist; in chronic cases they are usually dry. Wheezing and whistling are due to a distortion in form or size in the larynx or air passages. Wheezing is a modified whistle. In a majority of cases the cause of it is fracture of the nasal bones, or on account of the formation of a polypus in the nose or throat, and in case there is a dent left where the fracture unites the best thing to do is to trephine as soon as possible, and in the case of the polypus use an excision, using a piece of steel wire instead of the chain, being much more convenient and as safe. Wheezing is present in asthma. Thick wind may be classed with the wheeze. The causes are generally in the air passages, but it may be in the lungs. In all those troubles thick wind comes first, next wheezing, then roaring, due to the passages growing smaller, and in all those cases in addition to the noisy breathing there is a heaving of the flanks.

CHRONIC COUGH is usually due to some diseases of the larynx. Chronic thickening and inflammation causes the mucous membrane to become very much irritated. In this case there is an increased vascularity, particularly of the vocal cords, and the cough is recognized as being dry, husky and hacking. This cough when due to laryngeal trouble is very irregular, it may be only a few coughs at a time when first taken out, or it may be a spell of coughing lasting several minutes and coming oftener. This cough can be brought out by pinching the larynx, other times it is necessary to speed the animal. A chronic cough is looked upon as very objectionable, and is incurable because it is difficult to reach the seat of the trouble. I think counter irritation is the best thing that can be done in this case and to relieve the cough give internally: camphor, belladonna, glycyrrhiza, digitalis and hydrastis, also tinct. of iron $\frac{1}{2}$ oz., chlor. potash $\frac{1}{2}$ oz., and continue for months. For the cough Prof. Dick gave a bolus composed of powdered digitalis 1 dr., powdered opium 1 dr., powdered calomel 1 dr., camphor 1 dr., given night and morning. Iodide of potash is good for the thickening of the membrane.

CROUP IN CATTLE is different from in any of the other lower animals, called synanche tracheolitis. There is a tendency in cattle for the inflamed membrane to exude more of the plastic nature than in the horse, which is more mucous, this in cattle coagulates and organizes, and forms what is known as false membrane, and is almost always confined to young animals, while in cattle something else is more likely to occur than

croup. Croup is usually seen in young cattle that are left out to sleep in creek bottoms when the nights are cold and frosty, this trouble usually occurs in October and November. The false membrane that is sometimes formed will become loose and is coughed up whole, but it generally comes in chunks. It is of a grayish white, sometimes yellowish brown color.

Semeiology.—There is a hoarse cough, with a free ropy saliva from the mouth, similar to that in laryngitis, this is due in the horse to the stimulation of the carotid glands. There will be more or less swelling, with some pain, difficult swallowing, enlargement of the parotid glands and mucous glands around the throat. Pus wont differ from other acute diseases. In the course of from two to five days the false membrane either comes away or softens from fatty degeneration and so becomes loosened. Suppuration of the mucous membrane often occurs underneath this false membrane. This is a serious condition.

Treatment.—Put the animal where it is warm and comfortable, if dyspnoea is serious practice tracheotomy same as in the horse. Give internal application that will act antiseptically to this inflamed throat, such as chlor. potash, borax, inhalations of medicated steaming, medicate with iodine, permanganate of potash. Sometimes swabbing is good with the nitrate of silver 30 gr. to 1 oz. water. In the horse we have something like this, it is called quinsy in the human and means a suppuration of the tonsils. The horse cannot get this because he has no tonsils, but gets what is called deep abscesses in the throat. Quinsy in the pigs is like in the human. This is called in human practice cynanche tonsillitis, and often strangles the patient.

Symptoms of these abscesses in the horse are similar to those in laryngitis, and usually there is some little fever. Temperature may be as high as 104 while the pus is forming somewhere. For these cases we usually poultice for a week or ten days, then operate on the throat by first locating the blood vessels, and then making an incision parallel with them, so that if one of them is cut it will be lengthwise instead of across and so be less troublesome, then cut into the abscess, and if necessary enlarge the opening with a director, syringe out with antiseptics, afterwards poultice, give internally camphor or glycyrrhiza, feed on soft food, dress night and morning, keep up poultices for three or four weeks, if the skin gets sore use camphorated oil instead of poultice for three or four days.

Quinsy in the pig comes on the same as croup in the calf.

Treatment.—Scarify deeply and outside, give a little chlor. potash in their water or feed, rub outside with turpentine oil.

DIPHTHERIA.—This is not very well known in veterinary practice, the question is whether it exists or not? Prof. Williams says it does exist in the dog or horse, but in this country we have never seen any in the horse, but in dogs we have seen much fever, malignant sore throat, some sort of specific blood poisoning, rapid nervous prostration and death from two to five days, and there is no disease we have met with that runs so regular a course as this does and terminates in death, and all die. The first symptoms in the dog are, attempt to swallow without success, redness of eyes, loss of appetite, then the mouth begins to open, the lower jaw drops down the inside of the mouth grows a darker red till it becomes a dark brown, the throat becomes more or less tumified the saliva is ropy and the glands around the throat swollen and a nervous prostration takes

place some hours before death. Many of these symptoms are similar to those of rabies. In rabies there is however always delirium and inclination of the animal to bite. Prof. Williams in autopsy, found the stomach full, which is a strong symptom of rabies. Where we have examined we always found the stomach empty. In rabies there is nervous paroxysms, and always in rabies there is delirium while in this disease there is none of these. In rabies the dog dies in a comatose condition, in this they do not, and we have put curs in the cage with dogs affected with this disease and they were not bitten, and as a rule they will bite when in delirium. Dr. Lagorio pronounced a piece of the stomach of one of those cases to be similar to those of rabies, but taken all into consideration we are inclined to think it is not rabies, but are not sure. I believe a rabid dog is always delirious.

Treatment, Rational.—Give quinine and stimulants and antiseptics. We failed to cure a single case. We concluded there is some specific disease in it since it runs such a regular course.

BRONCHITIS.

(It is always stands for inflammation.)

There are three kinds, acute, subacute and chronic. It is very prevalent in this climate. Bronchitis is an inflammation of the mucous membrane lining the bronchi. In the horse we seldom ever find uncomplicated cases of bronchitis. It usually starts as bronchitis and runs down into the lungs involving the throat and lungs, then called bronchial pneumonia that is the form we mostly meet. It often also involves the pleura, then called pleuro-pneumia. In cattle we often have uncomplicated forms of bronchitis and is then confined to the bronchi, and is the easiest form to treat, and easiest of recovery. When it is severe in the animal it usually starts in the large bronchi and extends to the smaller air passages and involves the air vesicles and runs a definite course; first, irritation; second, congestion; third, inflammation, and may be wet or dry. In the inflammation we get effusion and exultation. In mild cases there is an absorption of the exudate and recovery, in severe cases it may go from suppuration to septæmia and death, or terminates in the second stage in occlusion and collapse of the air vesicles, and death. This collapse of the air vesicles is called, atelectasis.

The time for recovery in the mild form is from one to four weeks, but in the other case may run on to five or six weeks, but may die any time if septæmia has set in.

Etiology.—Exposure to sudden cold or dampness, same as diseases of the air passages. We often find a common cause is an extension of some throat trouble down into the lungs, also visciated air, found in shipping across the ocean during storms when everything is closed down and the air becomes foul. This foul air will precipitate glanders when there is any lurking in the system, and any other specific disease that may be laying latent. Bronchitis is often caused by the introduction into the bronchial tubes of foreign bodies such as medicine, and here remember to be careful not to hold a horse's head too high when giving medicine, and if he coughs at once let the head down, as they are liable to get medicine down the air passages. Children and dogs often get things down their throat that they are playing with. Bronchitis due to inhalation of hot air or smoke in burning stables usually proves fatal.

Semeiology.—Bronchitis is usually ushered in with rigor, following the rigor we have high fever, usually from 105 to 107, in draft stallions may run up to 108. Pulse, round, full and soft, running from 45 to 60, during rigor it runs from 80 to 100, according to the severity of the case. It is difficult to take the pulse in bronchitis because it is so soft in the acute form. The respiration is always accelerated in the acute form, and as the disease progresses we will find the respired air very hot. This is a valuable symptom, as it tells us the disease has run some time, even though the owner tells us different. We also find that the air becomes cold when the pulse runs up to 70 and 80, due to the fact that the air does not reach the air vesicles on account of the occlusion of the bronchi and there is only a tubular breathing, as occlusion of the bronchi advances, the air becomes cooler and cooler, respiration more frequent, and there is heard a hoarse, husky, painful bronchial cough. This cough is made with the mouth closed, the other kinds with the mouth open. The last kind of cough is due to the effusion, and is a moist one, the bronchial cough is a dry one. Auscultation is the means we have in the early stage. You will hear a loud rasping sound called ronchies, this will be heard also in the first stage of congestion in the mild cases at the base of the neck, when severe it will be heard in the lungs and not in the neck. When the disease has reached the stage of effusion you can hear the mucous ral, which proves that the large bronchi are affected. This mucous ral will be heard in the lower third of the passages and not in the upper. The third stage of the disease is recognized by the fœtid smell, very disagreeable even before there is any discharge from the nostrils, after the second stage when the rasping sound was heard. When the horse is convalescent the sensibility of the mucous membrane seems to subside, the cough more prolonged and less painful, and there is a mucous discharge from the nose. In the early stage of the disease there would be more or less stimulation of the salivary glands, but no increase of thirst, but it is in the later part. The urine is scant and highly colored, and appetite more or less lost. Cattle, sheep and dogs will lie down, but if the horse does he soon gets up again with groans. The fæces is at first dry, but in a few days becomes slimy colored. This is a symptom that the fever has lasted three to six days. Precussion does not show any material change from health. In the latter stage weakness becomes very great so the horse staggers. Emaciation takes place very rapidly, and the visible mucous membrane becomes very dark colored. In the first stage the nostrils become dilated, and in the second the expired air is loaded with moisture as the symptoms advance, finally the horse drops and soon dies.

Special pathology.—The first effect produced by the acute inflammation is desquamation of the columnar epithelium, and also of the ciliated, this leaves the whole bronchial surface denuded of its membrane, leaving it unprotected. The inflammation often involves the mucous tissue extending through the basement membrane, and all tissue around that part swells and is consumed. On account of the ciliated epithelium being removed and the mucous not being got rid of there is a possibility of it settling, the watery part being expired and the inspissated matter remains, becomes putrid and forms tumors. This used to be considered a kind of tuberculosis, but it is now known better. Next is the second stage that of effusion, then the serum and the mucous mixes and accumulates on

the surface of the bronchi (large ones) causing local inflammation. The horse will usually cough this up, or will lower his head and it will run out, or may be passed out in the moist respired air, or as the inspirations are stronger than the expirations this mucous may be drawn back, causing occlusion of the smaller bronchi, this causes what is called atelectasis, that is a collapse of the air vessicles, or a part of them, and is followed by a species of consolidation, and resembles a foetal lung. When the lung is in this condition, it is impervious to air, is so that it will not crepitate when handled, and sinks in water. Those are good proofs in case you are called to testify in court on the severity of a case. In case the horse dies in the second stage the small bronchi are full of mucous. The lungs of such a case will float, but it may have been a severe case anyhow, as the horse may have died from asphyxiation. In the third stage there will be this condition of mucous and more or less gangrene, that is the large bronchi, the small ones filled with a frothy mucous, or may be covered with small gangrenous spots. In cattle in atelectasis there may be the same condition. When this lung is first taken from the chest it will be a little larger than the collapsed lung, and when cut across will be found to have been congested and filled with the dark venous blood, but after being exposed to the air and light takes up oxygen, the blood assumes a scarlet color, say in about 20 minutes.

Treatment.—The first thing is to put the animal in a warm, comfortable stable, large, loose, roomy stall, pay particular attention to the hygiene, such as pure air; it is best to put a stove in the stable, if there is no other way of heating, and have the air pass in over the stove, but not have the stove close to the animal. Keep a temperature of from 60 to 66, depending how the horse was kept before it was necessary to put the stove in; give plenty of good bedding, and during the chill plenty of clothing, and as the fever decreases take off blanket at a time, but never bleed, as they did in the old way, as the horse needs all the vitality he has, and do all you can to keep up a strong heart in the horse. In bad cases it is best to take the pulse regularly and to give stimulants of different kinds: spirits of nitre, ether. In the first stage lac. ammonia; whisky is invaluable, and if your horse gets worse, increase your stimulants. In case the breathing and lung troubles are severe we often give chloral hydrate, or a little morphine; be careful in giving morphine, we usually give about 2 grs. three times a day, and the chloral hydrate from 1 to 2 drs. a day. It is a good plan to give the horse a medicated steaming, medicate with iodine, permanganate potash, or carbolic acid. Muriate ammonia is indicated as being a special bronchial stimulant. In the early stages a heart sedative should be given, as tincture of aconite or veratrum, give only in small doses and watch the heart. Keep up a good strong pulse, keep it strong from the start, and if whisky does not do it, give digitalis, and as a last resort in very severe cases give nitro-glycerine hypodermically. In the first three days stimulate the kidneys freely. In fever there is combustion and belladonna's action is to contract, and it contracts the capillaries and so lessens the flow of blood and so lessens the flow to the inflamed part. Treat a chill vigorously and also give sedatives; you can give phenacetin or acetanilide, but be sure to always give some stimulant with them, about 1 dr. of ether and 2, 3 or 4 oz. of whisky. Do not exercise at all. We think counter irritation is good. Prof. Robertson

believes in this, but Williams thinks it should not be given, but rather poultices, which we know to be impracticable and inconvenient, except in dog practice, where you can take the dog into a house. We often prefer anodynes as this one: ammonia aqua 1 oz., ol. terebinth 1 oz., ol. lini enough to make all 8 ozs., rub well once or twice a day; do not rub so freely after the first application. Mustard is very good, handy and convenient; mix it a little thinner than for human, so as to run through the hair to the skin, then put a newspaper over and then cover with blankets, so as to keep warm, and also to help the mustard to do its work. As to the frequency of dosing—about the same as in simple fever, but a little more vigorously, and reduce the temperature as soon as possible.

CHRONIC BRONCHITIS.—This is not as common in the lower animals as in men, but it occurs sometimes, and with it a bronchial cough is recognized as coming from the bronchial tubes and is made with the mouth open; usually there is a noisy breathing or wheezing, caused by the chronic thickening of the lining of the tubes; this wheeze is about the same in expiration and in inspiration; in all cases there are more or less emaciation and indigestion. Sometimes chronic bronchitis comes about as a result of indigestion, because the stomach and the lungs are so intimately connected. In this sort of bronchitis we get a chronic dilation of the small bronchial tubes and an impairment of the lung substance as a result of the severe indigestion. When the temperature goes down to 104 it is favorable, that is, if the heart grows strong with it. During convalescence it is good to apply hot lard once or twice a day. In dogs we often use mother tincture of sponges, or mother tincture of toasted sponges. This we usually give in from 2 to 10 drop doses every 2 or 3 hours. In acute bronchitis, which we can tell by the cough, which is well marked and can be drawn out by pinching the trachea, this mother tincture of toasted sponges is also good for little children when they have colds. In cattle we often get cavious tumors, and this keeps up irritation and runs into chronic bronchitis.

Semeiology.—The most important symptom we get by the labored breathing being a sort of a double expiratory movement. There is a chronic cough, dry, hard and hollow.

Treatment.—We cannot bank very heavily on these cases. Give iodide potash internally, and if possible run to grass, usually give 1 dr. doses night and morning for about ten days, then stop for a while. In case there is severe dyspnoea give anodynes, such as chloral hydrate, lobelia. Give nux vomica internally; this helps the stomach, and so helps the lungs.

EMPHYSEMA. Broken Wind, Heaves.—There are two kinds, vesicular (horses), and interlobular (cattle). There can be emphysema of any part of the body, and is sometimes called emphysematic condition. In cases where the air gets into the cellular tissue, that is, where the tissue becomes infiltrated with air, this condition is recognized by passing the hand over the skin where it is swollen; you will find it flexible and elastic. In broken wind we have infiltration of the lungs, and it occurs in two ways.

VESICULAR.—In this the air vesicles become dilated, and this dilation causes them to press hard on the blood vessels, has a tendency to

make the blood vessels contract or diminish in size, and a gradual defacement of them, or a destruction of them, followed as a consequence by anæmia, and the nervous system leading to the localized emphysema may be injured by acute bronchitis, as in case of occlusion of some of the small bronchi. The air cells at the ends of this bronchi take a rest, and while they are taking a rest the healthy ones are doing double work, and soon become dull and pale, constituting a case of emphysema. Another way that this is developed is when the horse is being driven fast facing a wind, the stomach being full,—this does not allow the diaphragm to do its work properly,—and the ventricle on the right side becomes weak, and in this case we find ventricular dilatation, which necessarily produces weakened cardiac power. The air cells gradually become larger and larger till finally they are ruptured. In the horse they may rupture into each other as the lungs are so interlobular. This rupture of the cells is seldom seen in cattle, while the interlobular is seldom ever seen in horses. Interlobular is an accumulation of air in the interlobular tissues, which sometimes occurs from rupture of the walls of the vesicles; other times it oozes through the pores of the vesicles due to an ænemic condition; this form is nearly always confined to cattle.

Etiology is tabulated under four heads: 1st, heredity; 2d, breed; 3d, dietetic; 4th, structural changes dependent on a previous diseased condition. Heredity, all kinds of malformations and constitutional weaknesses are hereditary, for instance, a man would be foolish to breed a good mare to a stallion that was affected with heaves, and the stallion is the principal in breeding, as he furnishes the seed, but of course the soil must be good, and therefore the mare should also be good.

BREED.—This naturally goes back to the hereditary, as for instance we often find breeds that are predisposed to disease, as heaves. Dietetics You will notice that animals after a severe attack of some thoracic disease are usually short winded, showing that the lungs were permanently injured. We are inclined to think every case of heaves is in a gluttonous horse, and you will notice him get pot bellied generally. The first thing to bear in mind is that the pneumogastric nervous system supplies both the lungs and the stomach, and the gluttonous horse overloads his stomach. They eat as a rule all they can hold, the effect of this is a dilation of the stomach, you then get the same condition in the stomach that you get in dilation of the vesicles, causing an anæmic condition and produces chronic indigestion shown in the staring coat. Sometimes feeding on timothy causes heaves, and it has been found that taken off of timothy and fed on prairie hay they have often recovered completely. Ground grain, mixed with bran, is good food for heaves.

Semeiology.—One of the most important symptoms we get is the double expiratory movement, the first part being performed naturally, but the last half is the abnormal part and is jerky, the inspiratory movement is made easily: I may say here that too ripe clover also causes heaves, and like timothy should be cut before the pollen has fallen. Often a horse is taken out and driven without showing any signs of heaves, but on being forced on a full stomach develops the heaves, which had been coming on, but is now suddenly taken very severe. Symptoms continued.—There is no fever no matter how acute the case; the pulse as a rule is nearly normal, may be from 10 to 25; it may be slightly irregular. This is no indication of the heaves, but is of indigestion. Respiration

usually very materially increased, often double; there is a jerky motion of the flanks in the expiration; it may be jerky and then there is a sudden fall back of the abdominal muscles after the respiration, which gives the motion peculiar in heaves. Cough is short and husky, and a bronchial cough; there is a mucous rale, but only occasionally; but this is of no importance. In the early part young horses retain their spirits; old horses suffer from nervous condition, become pot bellied, emaciated, staring coat, and sweat easily; this is brought about by the chronic indigestion.

Treatment.—One of the most important things to remember in treating heaves is to muzzle the gluttonous horse after you have given him the proper amount of feed; change the diet, give easily digested food, and if they are confirmed gluttons put shavings for bedding, as they will even eat their straw bedding; give grass when it is possible; dilute all contracted food; if you give oats scald them and mix with bran.

Therapeutics.—Give some drugs that promote a healthy condition of the bowels and therefore of the nerves, as arsenic about 2 gr. night and morning, with *nux vomica* $\frac{1}{2}$ dram night and morning for about two or three months. If the paroxysms are severe as dyspnoea, give chloral hydrate, belladonna, lobelia. Smart weed is used in Canada. Be careful in recommending a horse as being sound that he has not been drugged or patched up by tricky horse dealers, but if you have the slightest doubt make them leave the horse with you two or three days, when the drug will have worn off.

ASTHMA.—Some authors make a difference between this and broken wind, others do not. Prof. Robertson being one of the former. He says it is a peculiar diseased condition marked by paroxysms in the attacks marked with much difficulty in breathing. So we say that asthma is a spasmodic paroxysm, probably due to the spasmodic contraction of the muscular fibrous muscles encircling the bronchial tubes; and so we are inclined to believe that asthma does exist in the horse. In the early stages of broken wind there is a condition closely resembling asthma, though there are intermittant pauses which are not in broken wind.

Cause.—The most common cause is hereditary, and we get from direct or reflex nervous irritation, or from overwork, etc. Prof. Robertson says that asthma should be classed with the constitutional diseases; in that case it should go back to hereditary, and he believes this case to be from dietetic causes, and gives the same cause as for broken wind. There is in the early stage of broken wind a large amount of irritation in the surrounding muscular tissue of the bronchi attended with paroxysms.

Semeiology.—The attack is sudden and distressing, but is often of short duration, and there is considerable dyspnoea in inspiration in asthma as well as in expiration, due to the diminished calibre of the bronchi; the double respiratory is less marked than in heaves. Asthma is a functional disease while broken wind is organic. During the attacks of this disease there is an anxious countenance and more or less exhaustion; sometimes a cough—it is short, deep and suppressed, but not regular—and wheezing is more distinctly heard than in heaves. Auscultation or percussion does not reveal any diseased condition; a strong proof that it is asthma is, that there may be a disappearance of the symptoms; there is no fever, as a rule; sometimes the constitutional disturbances are considerable; after existing a few hours there may be a mucous rale. Breathing is sometimes thick, done almost wholly by the abdominal muscles.

Treatment.—Remedies useful in heaves are good in asthma, as anodynes and stimulants; also the depressor motor agents, as ether and chloroform; the bromides: belladonna, aconite and chloral; also morphine and arsenic are recommended by Williams, and remember, what may do in one case will not benefit all, so try different drugs until you get the one that suits the case.

CONGESTION OF THE LUNGS.—Known by the names of Pulmonary Apoplexy, Hæmorrhagic Infarction or Impaction. This is a disease that exists occasionally, but not very often. In its nature it is simply a form of Hyperæmia of the lungs. In this there is to a great extent an engorgement of the pulmonary blood vessels, and, as in all bad cases of congestion there is a tendency of exudation through the walls, generally due to some obstruction in them and a consequent dilation. In some cases rupture of the capillaries takes place, then we get patches of hæmorrhages known as Ecchymosis.

Etiology—The most common cause is overexertion suddenly applied when not in a condition to take. It does not usually run to such a serious condition in this country as in the old country. For example, a horse is kept in the stable for some time and is fed highly, gets no exercise and has developed adipose tissue; then he is taken out and apparently is feeling good; the driver speeds him for three miles or so, the horse is sweating, is short of wind, the eyes become bloodshot, the ears droop and the horse stops, there is a distress for breath, the pulse is tumultuous, the heart's action is weak, the expired air is cold, often times frothy mucous often streaked with blood comes from the nose, and where the tissues are weak get bleeding from them, on account of rupture of the capillaries. This is a case where the horse was not probably predisposed to the disease, and he would not get it if he had been properly exercised until the adipose tissue had been reduced and the muscles that had become weak had time to get strong. In cases of severe dyspnœa the horse may die in an hour or two, or may run on for a few days and then die from dyspnœa or gangrene, or if only a part of the lung is affected, from gangrene of that part; this in from a week to ten days. The symptoms are nearly the same in all cases, but the causes are many. It may occur from embolism, as that part of the lung supplied by the vessel gets plugged. Sometimes a moderate exposure brings it on, and may run to a serious case and die.

Splenification of the lungs means becoming of the nature of spleen, that is, so severely congested.

Post Mortem—Pulmonary blood vessels are entirely engorged in a state of apoplexy. You will find patches of black consolidation, but on feeling they are spongy. These are the patches spoken of as ecchymosis. extravasation there is a rupture of the capillaries and a flow of blood into the surrounding tissue. If cut across the lung it is black, or the blood vessels are filled with tarry blood; the lung will float under the water; the exposure to the light and air will turn this lung to a scarlet color. Hypostatic congestion is congestion taking place after death, that is, usually a settling of the blood to the most available part, or to the side on which the patient was laying for some hours. It flows there by gravitation either during life or at death.

Treatment.—First thing to do is to remove the cause, and then give fresh air. If it occurs on the road take off the harness, rub well, give a small drink of cold water; give stimulants, as whisky; give sulphuric ether

it is good; bleeding, though not favored much now, might do good in this case; give no counter irritants, they are harmful; keep quiet; give laxative food and keep a strong heart.

PNEUMONIA.—This means an inflammation of the parenchymatous tissue of the lungs, which is the functional part of the organ. Pneumonia exists in three forms—acute, sub-acute and chronic. In the acute we find the inflammation locates itself in the walls of the vesicles. There is an exudate thrown out into the interlobular tissue and is very extensive; this coagulates and partly organizes and gets quite solid.

Old authors recognize 3 or 4 kinds of pneumonia; the more recent but 3. The old called the 1st, croupous or lobular; they meant by croupous that the exude was fibrous. The more recent ones look upon it as meaning the formation of false membrane, and as there is no false membrane they dropped it and use fibrous instead. 2d, Catharrhal; the old authors used to classify it with lobular where it was in patches in the lungs,—not in the whole lung,—this has been found to be an error; you can have the lining of the bronchial tubes inflamed in all kinds of pneumonia; so it can't be confined to catarrhal alone. 3rd, Caseous or interstitial; by this was meant pneumonia that involves the interstitial tissue, more particularly the interlobular on the outside, and was usually localized. In tuberculosis we get interstitial pneumonia; it is caseous, and in glanders you get interstitial pneumonia, but it is fibrous, but it is called fibrous inside the caseous. Caseous sometimes occur in cattle and in man; catarrhal in the dog and children, while in the horse it is the interstitial. The characteristics of these different kinds are—the fibrous is more solid, more dense, and is glistening when cut, and passing the fingers over it, it feels rough; the caseous is opaque, smooth and lusterless; catarrhal is smooth and moist; it may glisten a little but is comparatively soft; we seldom see interstitial pneumonia in the lower animals unless from poisoning. In the chronic form the most typical example is seen in glanders in the horse, tuberculosis in any animal, including human; this form of pneumonia starts at a certain spot and spreads slowly, and involves a part from as big as a walnut to the whole of the lung. Coal miners are predisposed to interstitial pneumonia from inhaling the coal dust.

We recognize pneumonia as running through certain definite stages. 1st. Arterial injection; this goes to the time of the chill and is the starting point of the inflammation; this is the stage of congestion, and according to the severity and extent there is painful breathing, and by auscultation we get crepitation as heard in the air vesicles, caused by congestion producing dryness and the pressure on the vesicles. The 2nd stage is that of oedematous or of effusion, and is more or less prolonged, it may last but a day or two if both lungs are involved, but if only one lung is involved it may run into the third stage in about a week or ten days. In post mortem if this lung was cut across we would find the interlobular tissue infiltrated with serum and frothy mucous and an engorged condition of the whole; the lung is of a dark brown red color, soft and easily torn apart; we could see that the elasticity of the lung had been destroyed; the lung will float out, not on top of the water like the healthy one; in the latter part of the 2nd stage the lung would go almost to the bottom, and when it reached the third stage it would sink. This stage is called the Red Hepatization; in this the air is all squeezed out of the air vesicles. In the third stage the effusion and exudate have become quite

solid on account of the fibrin in it, and the lung no longer crepitates, as there is no air left in the vesicles. In the horse in this stage there is a further softening, in cattle it is sometimes hardening, and in this stage the lung substance is of a dark red color, but becomes scarlet on exposure to the air and light. In the ox this stage does not develop evenly as in the horse, but in patches; it will always be found mottled, as some lobules are effected and others not so yet. The time it takes to run from the 3rd to the 4th is indefinite, but as the color in the 3rd fades it runs into the 4th stage, that is the only difference you get, from red to gray hepatization; this has a tendency to degenerate into a soft mass and liquifies more or less. The horse never runs to this stage. In the ox in this there is a further hardening. If only about one-half or one-third of a lung is effected there is some chance of recovery, but if all of one lung is affected the chances are small. The fourth stage is sometimes spoken of as suppuration stage; usually the horse dies in the second stage from a filling up of the interlobular tissue and pressure on the air vesicles. If both lungs are effected in the 2nd he will surely die, and if only one lung and runs on to the other stage he may die from gangrene; this gangrene may exist from two to five days and becomes soft and very foetid and is of a dirty green color in autopsy.

Location.—In one lung called right or left lateral pneumonia; in both lungs called double pneumonia. We find the greatest tendency to be to choose the right lateral. A German physician made an average from 6666 cases in humans that he saw affected and gave 53.7% right lateral, 38.23% left lateral and 8.08% double, and this average will about suit the horse also. In case of recovery from pneumonia in a good case the inflammation terminates by resolution; this occurs by softening of the exudate and of course along with it the consolidation and absorption. In some cases this does not take place nicely and leaves the lung with some chronic inflammation which injures the wind of the horse.

Etiology.—Most common cause is exposure, especially in a damp, cold stable, when exhausted and sweaty; inhalation of hot air or smoke, foreign bodies getting into the bronchi; wounding of the lung from any cause, as broken rib, shaft splinter, bad ventilation, etc. It may be caused in one lung by a Thrombus where there is no free arterial anastomosis.

Semeiology.—There is a chill which lasts generally several hours and is well marked. Soon after the chill, when pneumonia is developing, we find there is labored breathing, elbows more or less turned out, and increased working of the ribs, heaving of the flanks, and the expired air is hot, pulse is increased in frequency, is full, loud and a little shade softer than normal; but in a bad case the pulse is rapidly increased, smaller and weaker. In uncomplicated cases of pneumonia usually there is no cough, but if the bronchial tubes are involved there will be a cough; when there is a cough it is not painful. In the first case by auscultation we hear crepitation; in the second stage we hear the same with a greater rasping in the bronchial tubes, and as this develops inflammation the breathing is more and more rapid; corresponding to the distress in breathing the pulse becomes weaker and weaker. The expired air in the second stage is cold as it approaches the third. When the third is developing the breathing becomes shallow; is tubular. In a hepatized lung we can often hear tubular breathing; this proves the occlusion of

the bronchi, as the difficulty in breathing increases we find that the nostrils are dilated as he labors for air to breathe and the false nostrils flap, the pulse by this time may be 80 or 90 and weak, the visible mucous membrane gets darker and darker, and is livid when it gets to the third stage, in this the dyspnœa is very marked, in his efforts to get air he will move about with an anxious countenance, he will sigh, and there is an accumulation of mucous in the corner of the eyes, the extremities get cold, the horse will stand to the last, but the ox similarly affected will lie down. Temperature in the early part might not be above 103, where it only involves one-third or one-half of a lung, immediately following a chill it will be up to 106, and hang around that, and in case of consolidation it will be increased as long as it lasts, till the exudate softens and is absorbed. In this case it is not well to try to reduce the temperature too soon, as it may have a bad effect on the heart, so reduce it gradually. Where the temperature starts in at 106 it is likely to hang on from four to six days. The horse is liable to die in the second stage oftener than to run into the third or fourth, that is where both lungs are affected in the second he dies from œdema, third stage from pressure on the air vesicles, or he may run on to fourth and die of poisoning that is gangrene, this is death from pyæmia. In favorable cases the absorption takes place by softening process, and as it softens the breathing becomes easier, pulse and temperature improves at the same time. Anæmia is one of the effects of any debilitating disease particularly pneumonia.

Treatment.—The rigor is treated the same as in any other case, we do not usually find out that pneumonia is developing till the case is from two to six hours advanced after the rigor, but in some cases the breathing is labored from the start. Immediately following the rigor give medicines such as aconite or veratrum to quiet the heart, and belladonna to limit the congestion, give diffusive stimulants to keep up strong circulation. Counter irritants are invaluable in the early part to draw the blood to the surface from the affected parts. We believe that those given early will often save the patient. If mild irritants do not suffice in a short time, say eight or ten hours repeat, and continue their use night and morning until the temperature is reduced. Ammoniacal liniment is the best in this case. Mustard may do just as well where it is difficult to get the other, and mustard has the advantage that it will not cause a blemish on the skin, we can tell when it has blistered by drawing it up with our fingers. Hot fomentations are good, if everything is convenient to apply properly, poultices are even good, after you take off the poultices grease the parts with oleaginous substances and pad with cotton. Treatment medicinally does not differ from bronchitis, only more stimulants, and oftener applied. Give acetanilide 1 dram, and whisky with it, if this fails to have the desired effect, I use quinine and whisky from $\frac{1}{2}$ to 1 dram, every 4 hours, till temperature goes down. It is best to alternate the quinine and whisky with the fever mixture every 2 hours, till the fever is down to 102, and even then keep up the whisky, giving about 2 ounces of whisky at a dose diluted $\frac{1}{2}$ with water. If the pulse grows very weak at any time give digitalis, but be careful and you should see your patient 3 times a day. If during convalescence there is an anaemic condition give tonic RX. TR. Ferri Ammon, Mur.,

Spts. Ether Nit. a a 1 oz. Aqua ad. Q. S. 1 pint. Dose 2 oz. every 4 hours.

Hygiene.—Treatment the same as in other lung troubles. In the fourth stage, when the horse is coughing up parts of lung, the proper thing to give is 1 dram carbolic acid in a linseed bolus 3 times a day, and give whisky to stimulate. Stimulants and diuretics should be given to ward off accumulations in the kidneys, as potash; but stop the use of the potash in about 3 days, when there is much diuresis.

PLEURISY.—Technical name Pleuritis; this is an inflammation of the pleura or lining of the chest; its cause in some cases may be traced to the extension of the inflammation in Pneumonia, and may affect either parts of the pulmonary or costal.

Etiology.—First, extension of inflammation from parts contiguous to, or in connection with the pleura; second, direct irritation from injuries, as from broken ribs, any kind of punctured wound, or the adventitious growth of certain kinds in connection with the pleura; third, the action of a rapidly lowered temperature or other meteorological influences; fourth, blood contamination as appears in constitutional and specific diseases. It may develop from Diathetic, Dietetic, Infective, Enzootic or Epizootic.

We recognize Pleurisy as running through 4 stages. First, that of congestion; second, dry stage of inflammation; third, effusion; fourth, absorption. Pleurisy in the first stage is the period of engorgement or congestion; we find that the pleural surface is spotted red in patches, which grow larger rapidly till they become confluent, till in the second stage there is a generally diffused red surface. The first stage is very short, only a few hours, and runs rapidly into the second, in which we have a dry pleural surface and the two dry surfaces rubbing together produce a friction sound; this stage is also very short, about from 19 to 24 hours; in this stage there may be two inflamed surfaces,—the costal and pulmonary, and then adhesion is possible and very liable to take place. The third stage is long; the first part is that in which the plastic exudate is thrown out on the surface of the pleura; this coagulates and forms the false membrane. Resolution may take place at any time, and in most favorable cases takes place after the development of the false membrane. If it does not, it runs on to complete the third stage by the serum running into and filling the pleural cavity, forming what is called Hydrothorax or water in the chest; as soon as effusion begins, friction sound stops, for the serum then lubricates the surfaces. This effusion in horses is usually very severe, filling the cavity with water, pressing the lungs so closely against the upper part of the thorax that the animal cannot breathe, and dies from Apnoea and nervous prostration. Death always takes place from this stage, though some say it may from the second stage, from excessive fever, but I do not think it possible. If the chest does not fill more than $\frac{1}{3}$, the fourth stage may take place, and this may be absorbed by resolution; but when more than $\frac{1}{3}$ full, absorption will not take place and the animal dies. The way resolution takes place after the formation of the false membrane, is by the process of fatty degeneration. In adhesion in the second stage it is the two false membranes that unite; this condition we often find in autopsy, but instead of the false membranes growing together they will become absorbed. About 95 per cent

recovers in this way, the other 5 per cent is in Hydrothorax. The extent of the Hydrothorax depends on the amount of surface involved, and also the severity of the inflammation; in many cases there is an œdemic condition in the walls of the chest, and in many cases it oozes out through the pores of the tissues and accumulates on the outside of the chest, resulting in a dropsical condition of the parts. This is seen more in cattle, and not so often in horses. In Pleuro Pneumonia (contagious) the œdemic condition is often enormous; there is invariably more or less œdema. Pleurisy, the same as Pneumonia, may be single or double, or may come under the fourth stage—blood contamination; it may affect every square inch of the pleural surface.

Semeiology.—It is usually ushered in with a shivering fit; there would be a little staring of the coat; often comes on with a heavy rigor attended with labored breathing. During rigor the pulse and the temperature rise and remain, as it runs into the Pleurisy so quickly; temperature will then be about 104, not so high as it runs in Pneumonia. The pulse is quite characteristic, is small and hard from the start of the disease and gets smaller as it progresses, and more rapid, from 55 to 60, but before the rigor is over may be 80, next day 90. This hard pulse is often called vibrating pulse; the ribs are usually thick, and the breathing with the abdominal muscles; the pain in the early stage of the disease is sharp, the animal will look around at the side, will lie down and roll, get up, kick, and other symptoms that much resemble those of Colic, and in the early stage is sometimes mistaken for Colic. In the early stage we often have depression on the side, along the ribs, and well marked, due to the contraction of the muscles of the chest, that is, the pleuritic lining; the elbows are usually turned out; by auscultation we hear distinct friction sound. Percussion reveals great soreness, particularly if you press your fingers into the intercostal space it may cause him to grunt. In Pleurisy there is a disinclination to move, sometimes due to rheumatic inflammation of the chest muscles, and is called Pleurodynia. Diagnostic symptoms lie in the pulse. In Pleurisy there is an increase in the pulse, while in Pleurodynia there is not much change; in either case you will often see a quivering of the muscles of the shoulder and chest, and in 9 out of 10 cases indicate a fatal case. In Pneumonia this is often seen; in Pleurisy it occurs in the early stage, but in Pulmonary Apoplexy or Bronchitis it would not occur until the last stage of the disease. If Hydrothorax develops, this quivering will stop; during this there is a loss of appetite and scanty fæces, and there are symptoms of high fever. Pleurisy may terminate in resolution in from 4 to 5 days; if it does not it will run into the third stage following the end of the second stage; following Hydrothorax the false membrane is in existence; this is a coagulation of plastic lymph. As soon as the effusion begins the severe colicky pains stop, and then the animal may lie down after standing 9 or 10 days, eat a little and breathe easier; these are favorable appearing signs but do not always indicate that the animal is better, as unfavorable symptoms may develop in 2 or 3 days, with more Dyspnea. In Hydrothorax there may be dilation of the nostrils, flapping of the false nostrils, flanks will heave, and the ribs being no longer thick, the expired air is colder, percussion reveals a dull sound below the collar line, so you can easily tell the water line; auscultation reveals increased respiratory murmur above the line and

none below. In Pneumonia you can't tell this line as well as you can in Hydrothorax. When Hydrothorax is well developed we find the visible mucous membrane gets livid and extremities get cold. In favorable cases, when the case recovers in the third stage, the water is absorbed and the inflammation is subsided. Pleural adhesion after recovery always depreciates the value of the horse, as he is liable to have stitches in his side and run his nose into any place, and may run you into a ditch, trying to get his nose around to the sore spot.

Diagnosis.—Symptoms may be rapid breathing, rapid, hard pulse and fever. In Colic there is no hardness of pulse, no fever. In Pleurisy the pain is continuous; in Colic it is intermitting.

Prognosis.—In favorable cases if the effusion is slight and fever slight, appetite good, no blood contamination, prognosis would be favorable. under reversed conditions the prognosis would be reversed. Pleurisy in any animal is serious; Hydrothorax is almost always fatal; you can form some idea by the effusion; if it is very purulent, fetid and offensive the prognosis is unfavorable; if it is amber-colored, odorless, and not too great an amount, the prognosis would be favorable.

Treatment.—Hygiene does not differ from other diseases of the thorax; fresh air and good quarters; temperature from 60 to 66.

If the case is only in the rigor, treat same as any other rigor; toward the latter part of the rigor, you will be able to tell by the increased breathing, elevation of temperature, how progressing. In this stage, just as soon as the Pleurisy can be recognized, apply counter-irritants, such as will produce great irritation; give diffuse stimulants combined, as aconite and belladonna. Then after a few doses of this, give fever mixtures, including the belladonna, potash, and liq. ammonia acet.; repeat counter-irritants after an hour or two; internal treatment need not differ from that prescribed for Pneumonia; feed on sloppy food, and here will say, bandage the legs and clothe warmly during the rigor. Most cases, if you get them early, will yield readily to treatment; and if Pleurisy is mistaken for Colic, there is no harm done by this treatment, but great harm may be done by delaying counter-irritants; hence a correct diagnosis during the early stage of the disease is very important, but if treatment is delayed 10, 15, or 24 hours, we are sure to have a serious case of Pleurisy or Hydrothorax. When we have a serious case of Hydrothorax it would be well to give digitalis. Remember the secret of success in treating Pleurisy is to stop it early by good strong treatment.

During Hydrothorax give digitalis, ammonia, fl. ext. gentian and nux vomica; during third stage give diuretics quite liberally; also give quinine. It is necessary to keep up a strong heart, then the effusion is more likely to be absorbed, while if the heart is weak the effusion is likely to go on increasing, and absorption not take place. The use of potash right along is good, and if the action of the heart is not strong enough to suit, give whisky or digitalis. The temperature in Hydrothorax runs about 103 to 104, and will stay up till after the effusion is absorbed, even after the inflammation has stopped; so pay close attention to the pulse and see that the kidneys are in good condition. Frequently if we can reduce the inflammation when the cavity is only $\frac{1}{3}$ full, we may get absorption and terminate favorably. We usually let Hydrothorax run 4 or 5 days or a week, and if not improved we tap; this is

called Paracentesis Thoracis. This tapping is usually done between the 7th and 8th or between the 8th and 9th ribs; I prefer between the 8th and 9th, for the reason that the elbows are apt to come back and interfere with you while you are operating. First locate where you are going to operate; cut off the hair and press your two fingers slowly but forcibly between the ribs, then draw back the skin a little so that when cut it will be about the center of the rib when you let go; cut through the hide with your scalpel, close to the anterior border of the 9th rib; don't go near the posterior border, as you will rupture the intercostal artery; then introduce your trocar about half its length, then pull out the trocar, leaving the cannula in so as to drain. When the chest is near full and there is great weakness, it is often necessary to tap both sides; when you do this remember the heart is inclined a little and you might lacerate the cardiac sack, so go a little lower, tap only one side at a time, and the other the next day, as it would be too great a shock to do both at one time; always give whisky to keep up the strength of the animal, and about one hour before tapping give him about $\frac{1}{2}$ pint. The chest may fill again and it will be necessary to tap a second time in about a week; don't tap in the same place though, or you may have to tap 3 or 4 times; it is apt to be always fatal when you have to tap more than once. When there is only about 6 gallons drawn and it does not refill there is a good chance of recovery, otherwise there is very little chance. On account of the œdemic condition of the intercostal muscles there is little pain attending the operation; but always warn the owner that there is danger of the horse dying from nervous prostration before you ever operate. Best to put a twitch on the horse's ear so as to draw his attention away from what you are doing. After drawing off the water always give stimulants; give tincture of iron quite liberally; see that he gets lots of nourishment, and drench with linseed meal tea. If the serum coming through the cannula is amber-colored, odorless and not in too large quantities the chances are favorable, but if red, fœtid and offensive,—unfavorable. Dr. Baker in 1892 before the class tapped a horse that held 18 gallons. In human practice they often tap in different places, then drench out with antiseptic, wash and drain out, and have quite a number of recoveries; but this is impracticable in the horse. You must be careful not to tap a hepatized lung in Pneumonia, as you will likely produce a fatal hemorrhage. In tapping, I go about four inches from the floor of the thorax. In the wash used in the human they put in one five-thousandth part of bichloride of mercury.

Digestive System, or Alimentary Canal.—Begins at the mouth or muzzle. The prehensile power in the horse lies in the lips, in the ox in the tongue. The lining of the mouth is called the buccal membrane; the velum in the horse is the soft palate which prevents any food that is swallowed (or attempted to be swallowed) from returning back in the mouth, compelling it to pass out through the nostrils. The food is mixed with the salivary fluid,—this is insalivation: in the stomach it is mixed with the gastric juice and passes out of the stomach as chyme; after chymification it passes into the duodenum, where it is mixed with the bile and pancreatic juice, and thereby, by the process of chylication, becomes chyle and is then ready for absorption by the absorbents, the refuse part of the food passing out of the body per rectum. The intes-

tines in the horse are about 90 feet long. The food is carried through the intestines by a peculiar worm-like motion called vermicular or peristaltic motion and contraction of the muscular coat of the bowels.

We conclude that most of the diseases of the digestive system are due to errors in feeding, or defective nutrition and digestion, and the whole can be classed under Dietetic. Generally, feeding is too bulky, too concentrated, too rich, too poor, too wet or too dry, too much digestible food, or too much indigestible; or the time of feeding is too irregular; this last often causes disease because it upsets the nervous system, causing many troubles. There is a great difference between animals that have a single stomach, as the horse, dog, mule, etc., and those having a double stomach, as the ox, sheep, deer, and all animals that remasticate their food. On account of the long time that the food remains in the stomach of these animals, they often have disease of the stomach from Indigestion, and seldom ever have diseases of the intestines, while in the horse the food remains but a short time in the stomach, and so the horse does not often suffer from Indigestion as the ox, but has more diseases of the intestines. Many physicians recognize the fact that too rich or too concentrated food causes disease of the stomach and small intestines, while food having too digestible matter in it will produce disease of the large intestines, as of the horse fed on too ripe straw or too ripe timothy. On this account Prof. Williams claims that food artificially prepared by being cooked is productive of disease; but from experience we know that he is entirely wrong, and though he may be right theoretically, he is not practically. It should not be applied to cooked food, as we know that cooking renders a large amount of food digestible, that would not be digestible unless cooked. You will find that too concentrated food will not work its way out of the stomach because it has not enough indigestible matter in it to cause the stomach to become stimulated to action; this is also true of purely digestible food. Wholly indigestible food will pass through the small intestines all right, but will lodge in the large ones, causing Paralysis, Enteritis, and death caused by the gases that arise from the fermentation of the food lodged in the alimentary canal. So in case of Flatulence we know that digestion is impaired or wholly destroyed.

Congestion of the buccal membrane is ordinarily known as Lampas, and is simply a hyperamic condition of the lining of the mouth; this is accompanied by more or less tumefaction, noticed more particularly in the bars of the mouth.

Etiology.—The inflammation attending the cutting of the teeth often causes it. In children and colts it is often caused by the milk teeth cutting through the buccal membrane, which may be very tough; while in puppies it is the permanent teeth that cause the trouble. Cauterization by irritating substances or medicines also causes it.

Semeiology.—Salvering in the mouth, where the salivary glands are stimulated and cause a constant flow of saliva from the mouth; on examining the mouth we find the buccal very painful to the touch, though a fresh case may not be; the bars of the mouth will be swollen and the buccal membrane all through greatly œdemic, and often in these cases the breath is very foetid. Turning up of upper lip is sign of Indigestion.

Treatment.—Ascertain the cause and remove it; foreign bodies, such as corncobs and pieces of wood are lodged in the molars, or their edges

may be so sharp as to scarify the cheek or tongue; this is all classed under irritative substances. If from Indigestion, give a laxative; in bad cases give acetate of potash in the drinking water; give soft food. Owners often think their horses have Lampas because they are off their food; they notice that the first few bars are swollen and often have them burned or cut when it may be due to natural causes. This is barbarous, and when the bars are destroyed in the mouth the tongue cannot force the food back in the mouth in a natural way, as the bars are designed for that purpose; hence there is a constant dribble out of the mouth of the food, while trying to eat. If you find an owner who must have those bars treated, just lightly scarify the first two or three and give some medicine that has no effect any way. Charge him a dollar for the cutting and 50 cents for the medicine, and you will satisfy him and not hurt the animal. If an artery should happen to be cut, take a little wad of oakum, dip in Munsell's solution and tie over nose.

STOMATITIS.—Soreness of the mouth, and is hard to separate from Lampas with **STOMATITIS**, and with Lampas we have some of the causes of Stomatitis. We find in some a predisposition to this, as in the case of foals, and is often called thrush in little children and in lambs and foals. It is really Catarrhal Stomatitis.

Semeiology.—It starts in a little red sack, about the size of a pea, and there are many of them. They break into raw sores in the mouth, and are covered with a gray, mealy substance; this is due to the exfoliation of the epithelium and to exudation. There is a foetid smell from them, and in most cases there is more or less derangement of the bowels and stomach. In the older animals we have the vesicular form filled with water; in a day or two they rupture, and the water escapes and may cause ulceration, but usually they heal rapidly and readily after suppuration. Then there is the pustular form, which is more severe and deeper-seated; they are formed in the same way, and the water often turns to pus. This pustular form often follows the vesicular form, and instead of rupturing turns to pus and then ruptures. The skin is thick and rots off over the pus, and this pus often ulcerates and leaves little pits. It is little seen except in contagious forms, or when caused by cauterization, as with blue vitriol, etc.

Treatment.—Remove the cause, give mild laxatives, followed by vegetable bitters, and then anti-acids, as bicarbonate of soda, one ounce to pint of water, creta preparation and water or calcis sulphate. Give a local application of a saturated solution of borax, 2 per cent solution of carbolic acid, glycerine, tannic acid, solution of permanganate potash 10 grs. to the ounce water. Use this once or twice a day. Borax may be used in saturated solution as strong as the water will take up, hot or cold. Tannic acid 1 dr., glycerine 2 oz., water to make a pint; apply 3 or 4 times a day, and don't forget to attend to the proper hygiene at the same time. If sores are obstinate in healing, touch with lunar caustic once or twice a day.

GLOSSITIS—Is inflammation of the tongue, and usually the interlingual tissue. It is usually caused by some accidental injury, or the attack of some specific disease, as Anthrax, etc. In any case there is much swelling, oftentimes filling the mouth and protruding when the mouth is held open, and the tongue is apt to be dry, and in this case gets a

dark brown color; deglutition is interfered with, the tongue feels hard, and is often very painful. Wounds in the tongue from chain halters often cause it.

Treatment.—Give laxatives if you get the case in time, or an aqua solution of aloes if the tongue is very bad; give this per rectum. When the tongue is very bad, scarify deeply and bathe with tepid water and encourage hemorrhage; after fomenting it for some little time, bathe with some antiseptic, as permanganate potash, chlo. potash, borax, New Orleans molasses, etc. Treat the same as sore mouth.

Prognosis.—Is usually favorable.

In case the tongue is lacerated, almost cutting it off, and if less than an inch holds it, it is better to amputate it. The operation is very simple, the hemorrhage usually very slight. In such case I would just take off with scissors; in case the hemorrhage would bother you, use a little of the mustard solution of iron, etc. In examining the horse for soundness always see that the tongue is all right; a horse with amputated tongue always has some trouble in eating, and eats in a peculiar way; he must have a deep, narrow feed box, and throw up his head to get the food back into the mouth. Bleeding between the third and fourth bars by inexperienced persons sometimes cuts the palatine artery. To stop the bleeding, in a small fissure, press the thumb against the opening for a little while, but if this does not stop the hemorrhage, use a wad of absorbent cotton about the size of a hen's egg, dip in mustard solution of iron, then place on the cut, and tie tightly with a bandage around the part, and leave until the hemorrhage has stopped.

PAROTITIS.—Is inflammation of the membrane of the parotid glands. There are two forms—Acute and Subacute. In the acute it is usually associated with some other fever, as Catarrhal sore throat. There is suppuration as in Strangles, Tumefaction, usually liberal and considerable soreness, and is prone to run into abscesses—may be one large or a number of small ones; these, when ruptured, discharge considerable pus on the outside.

Semeiology.—Swelling, pain on pressure, nose pointed out, neck stiff and disinclination to bend it, more or less fever. If the inflammation is confined to the parotid there will not be much fever, but where there is Catarrh you will get all the fever that comes with Catarrh. The inflammation often terminates by resolution. When an abscess is forming in the parotid, the point is very hard and painful, and will often be seen to sweat. When the abscess breaks internally it breaks into the guttural pouch, and the fluids then come out of the nose.

Treatment.—Hot fomentations and poultices are indicated; continue this right along till the abscesses break or terminate by resolution, and if suppuration is inevitable, hurry the poultices. After poulticing 4 or 5 days use stimulants—tr. cantharides, or in a mild case, the unguentum of cantharides. When there is a tendency to develop into a fibrous tumor by induration, etc., use as a local stimulant—a blister, mustard sometimes with it as a mild stimulant, then poultice over that. When the abscesses point so you can locate them, cut them, making only a small incision for fear of cutting through more of the salivary glands. We often have SALIVARY FISTULAS. To treat them, syringe the pus sack out with an antiseptic—as a mild solution of carbolic acid, then the full

strength of tinct. iodine, and, if necessary, use the iodine several times; if that does not suffice, apply a cantharides plaster, and if they become indurated we can soften by applying it once a day for several weeks, then use an unguentum of potassium iodide 1 dr. to 1 oz. lard—apply once a day; give soft food, and during convalescence give a tonic of iron, if you think there is sufficient anæmia to warrant it.

PTYALISM OR SALIVATION.—This is an unnaturally increased flow of saliva.

Etiology.—Very variable, very extensive; anything that unnaturally stimulates the tissues surrounding the glands. We find common causes are: Tetanus, Rabies, Strangles, Laryngitis, Catarrh, etc., and all diseases of the mouth. We can bring them all under the head of irritants or stimulants; that is, of the salivary glands. We recognize the disease by the mouth always being full of saliva; but is usually due to other troubles, so in determining the cause of this disease you must use your wits well to locate it.

SALIVARY FISTULA.—Is an opening in one of the ducts leading into the mouth, through which the saliva flows into the mouth. It may be any of the ducts, but the Stenos duct is the one usually affected; it enters the mouth about the third molar tooth. An accident on the side of the face may sever it, and in disease of it there is a continual flow of saliva from it. A predisposition to the disease may be a calculus in the duct, in which case the duct becomes distended, the walls thinner and more easily ruptured. These calculi usually have their origin in a foreign body, such as a wheat or barley grain getting into the duct and mineral matter forming around it.

Treatment.—Usually a case of this kind is chronic before the doctor gets hold of it; the wounds not being very large, generally they get little attention till they become chronic fistula openings, and are then very difficult to treat. We often find that the natural channel is closed from disuse, and has become obliterated. The first thing to do is to open up this part of the duct, and the best way to do it is with a metal sounder, taking the smaller size first, and as you increase the opening use a larger size, until you have an opening as large as a pencil. In starting the opening, push the sounder very gently and work carefully, so as not to break through the side. If you have ruptured the duct, it is usual to insert a seton for from 2 to 5 days, put a leather button on the end in the mouth, and also one on the opening on the side of the cheek and draw tight; clean once a day after you remove it; make a fresh wound of the fistula, then draw together with sutures; follow with antiseptic treatment, then coat over with collodion, which, as it dries, will contract and help to draw the lips of the wound closer. This usually cures it, but if you find in about 10 days that saliva is oozing out and the collodion breaking away, apply actual cautery all around the opening, about one-half inch from the opening, and, if necessary, make 2 rows of points, the inner one lightly, the other some deeper; then apply cantharides blister. Repeat this treatment if necessary. The text book says where this fails, destroy the gland by injecting forcibly into the gland the following:

R	Argentum Nit.	1 dr.
	Nit. Acid	1 dr.
	Aqua	1 oz.
	Mix.	

For my part, I would rather dissect the gland; so take my advice, and never do as the book says in this case. Best to feed the horse liquid food, so he will not have to masticate it, and keep the head tied up for awhile. You will get a cure if you have patience and continue this treatment.

SALIVARY CALCULUS.—Is a stone forming in one of the Salivary ducts; they are composed usually of phosphate of lime, but Prof. Williams also says they are formed of vegetable and animal matter as well. It is usually found in the Steno, and occasionally in Wharton's duct.

Treatment.—Remove them, but in a peculiar way; remove always in the mouth, no matter how much you must cut to do this, unless it be under the jaw, when you will have to open on the outside.

PHARYNGITIS.—This is acute inflammation of the pharynx. Fauces, or back part of the mouth, are usually involved, as well as the pharynx. This inflammation is a Catarrhal inflammation, and closely resembles that of Laryngitis, and is usually associated with it.

Etiology.—Same causes that produce Laryngitis—exposure in damp, cold stables, generally after the horse has been sweating or exhausted, etc. It is often caused by caustic substances, or foreign bodies.

Semeiology.—Great difficulty in swallowing feed and water, and after passing the velum often comes back through the nose; there may or may not be swelling on the outside. It follows the same stages as Laryngitis; when severe and the surrounding tissues are involved, abscesses form in the throat, usually on both sides, sometimes on one, sometimes above, sometimes posterior to the pharynx. When the fauces are involved there will be a cough, appetite usually unimpaired, but on account of the great soreness will often refuse food, will slobber in his drinking water; usually more or less fever; in an uncomplicated case there will be no Dyspnœa.

Treatment.—Apply counter-irritants early, and well up to the base of the ears, medicated steaming, medicate with iodine, carbolic acid, etc. Use for a gargle, tr. iron and chlorate potash. If the abscesses form and the soreness continues, an electuary containing camphor is indicated; use instead of the iron. These abscesses sometimes form in the guttural pouch, and if the pus cannot escape it amounts to the same thing as an abscess, and if not opened becomes inspissated. Where both sides of the throat are affected, there will be hard breathing. After Pharyngitis has been treated, if the pus is forming, as before stated, use poultices early, as it tends to soften, swell and relax the parts, and cause to work to the surface, and after a week or ten days you can open without hesitancy. For the abscesses that form above the pharynx in the center, the best way is probably to open in the mouth, on account of the blood vessels on the outside, and it is best to use a concealed bistoury; those on the side open on the outside. After opening an abscess in the mouth, lower the animal's head so as to prevent the pus from running down the trachea, which, according to Dr. Billings, may produce local Pneumonia. When pus forms in the guttural pouch, it will often run out of the nostrils when the horse lowers his head. When opening an abscess, always cut longitudinally with the blood vessels, so that if you cut one, it will not be as serious as if you severed it transversally. If you do cut a blood vessel, and it continues to bleed, it is best to stitch a little plug in,

and leave it in about 24 hours; and if it still bleeds when this is taken out, repeat the operation till it does stop.

ŒSOPHAGITIS.—Inflammation of the structures composing the œsophagus tube, which is very strong, muscular, and quite vascular, and is subject to inflammation from surrounding tissues.

Etiology.—Oftentimes from extension of inflammation from the approximate tissues, from scalding drenches or caustic substances in the feed or water; this cause is often seen in little children, from the fact that they put everything into the mouth that they pick up; in horses often caused from kicks and from other sources.

Semeiology.—Great difficulty in swallowing. If it is in the cervical region there will be great soreness on pressure; in a bad case there may be some febrile conditions. If the tube becomes ruptured, the food passing out will break down the intercellular tissues, causing much pain and swelling.

Treatment.—Soft, sloppy food, linseed meal, tea of slippery elm bark, a local injection of morphia. When the food passes out, showing a rupture of the tube, it generally proves fatal; but you might try to catch the ends and sew them, and bathe with healing applications, as solution of borax, bicarbonate soda, weak solution of carbolic acid, etc. These may be passed down the tube. We have Œsophagismus, which is a functional derangement, due to an irritable condition of the nerves. In this, the food passing down irritates and causes the muscles to contract, causing spasms; sometimes it contracts on a bolus of food, in which case, if the object is above the constriction, it will be thrown up; but if in the center of the constriction, it will hold on and the food will fill up to the mouth.

Semeiology continued.—Horse manifests considerable distress, if choking; will be nauseated, and will draw up the upper lip, often sweats, is restless, and if the object is thrown up, it is often streaked with blood.

TREATMENT OF ŒSOPHAGISMUS.—Give local antiseptics in the form of morphine, cocaine, etc. Give drench, like slippery elm tea, also nux vomica or arsenic.

CHOKING.—Is obstructed deglutition.

Etiology.—In all cases of choking there is an interrupted passage to the stomach, and anything that is interrupted between the mouth and the stomach is called a choke. It often occurs by animals bolting their food; this is a common cause in the horse. Cattle usually choke from swallowing large substances, such as apples, turnips, roots, bones, etc.; and in milk cows chewing clothes will often let a piece go down the tube. Dogs choke from such articles as coal, spools, fish and chicken bones, etc. Chickens, by swallowing their food too fast.

Semeiology.—Horse will stop eating, appear uneasy, back up, make efforts to swallow; after a little, Œsophagitis will develop and lead to chronic spasms, contractions of the muscles of the neck and shoulders, often so strong as to pull the head to the knees: will often scream with pain; sometimes you get Gastric Flatulency. Food and water swallowed may be returned through the nose; usually there is a cough. If the choke is in the cervical part there will be much swelling, and but little if it is in the thoracic part. In cattle Tympanitis sometimes occurs; in most cases breathing is labored, and slavering from the mouth. In dogs there

will be a continual coughing and retching and slavering. Poultry crane their necks and give a sort of shriek.

There are certain conditions, functional or organic, that cause choking.—1st, anything that favors spasmodic contraction of the œsophagus on the object; 2d, inflammation and ulceration of the throat and gullet; 3d, organic diseases of the gullet, as seen in contraction of that organ; 4th, any disease of the salivary glands interrupting the flow of the saliva; 5th, voracious appetite in any animal, diseased tooth, or anything that causes the horse to bolt his food. In the horse there will be anxiety of countenance, eyes bulging; but the spasmodic contraction of the muscles of the neck does not always prove that it is a choke, for it is also present in some troubles of the stomach.

Treatment.—If the choke is in the upper third, remove the object if possible through the mouth; this is done by using a mouth speculum to hold the mouth open while your assistant with his hands on both sides of the gullet presses the object upward. This is particularly the way when cattle choke on roots; you can often move them one or several inches upward, and then the operator can run his arm downward and get the obstruction out. This can almost always be done in cattle when the choke is above the center. In horses when due to *Œsophagismus*, if you can move an inch even, you can stop the spasm and the stuff will pass down. I find that this manipulation is the best way to give relief, that is, getting the object to move an inch or so either way, and then pouring down the œsophagus cottonseed oil, sweet oil, or some such oleaginous substance, say a few ounces at a time; it is best to pour it down the nostrils, because as a liquid passes over the posterior nares it causes a spasmodic and involuntary attempt at swallowing, and besides the animal sometimes will make no attempt to swallow anything you pour into the mouth. Stand on the left side while working the choke, which may be 4 or 5 inches of accumulated food, and every 5 minutes or so, pour some oil down the throat; always work gently for fear of bruising the œsophagus and causing inflammation, so be gentle and don't hurry; be careful.

Suppose these means do not answer; then get the history of the case, or get it first. What did he eat? If a solid body, use a probang; if it was soft food, then the probang will only make the choke worse if you force it too much. Use a smaller probang in the horse than for cattle. The probang should be about 8 feet long, else in case the obstruction being close to the stomach, you will not be able to reach it. Remember the epiglottis fits down closer in the horse than in cattle, so do not keep the probang in very long at a time, but in cattle may keep it in an hour and do no harm. When you reach the object press gently with the probang and a continuous pressure until the object moves,—have patience. You will often find that chokes in the horse when in the region of the thorax will prove fatal in spite of all you may do. For use in man and dog, there is a good probang made of horse hairs (tail). There is a practice among farmers in case of choke, of making the animal leap over something,—as a hurdle. I never saw where it was successful of any good results. In case you try all these remedies without success, don't give up without one more attempt for the horse's life, but let it be the last always; that is œsophagotomy. Clip the hair around the part

closely, then wash thoroughly with antiseptic; bear in mind the anatomy of the parts; don't touch the jugular vein or carotid artery; also watch for the nerves. Have an assistant go on the right side of the horse and push the œsophagus over towards the left side; locate the spot and make an incision on the side up high on the tube, go very carefully and slowly; don't cut clear down at one cut, but by a number of them till you reach the tube; now pull the skin upward so as to get as near the upper part, that is upper side of it, as much as possible, then make just as small an opening as will do to remove the object. Remove the object, then wash well with antiseptic; then with a fine needle and silk sew up the cut in the tube, making the stitches about $\frac{1}{4}$ inch apart, and about $\frac{1}{4}$ inch back in the tube itself; get the knots all on the inside so that when they slough off the food will carry them into the stomach. Always wash your hands well in antiseptic before operating to avoid the greatest of dangers in such operations. After sewing up the tube, then sew up the skin with good strong stitches about $\frac{3}{4}$ inches apart, then dress with antiseptic, as iodoform, etc. After treatment keep the animal standing for some time and feed on a liquid diet, as milk, so as to give the œsophagus a rest for a week or so until it heals. Where a voracious appetite is the cause of the choke, fix a feed box for him so that he can't eat voraciously or too much at a time; 3 or 4 cobble stones about the size of the hand does very well in the feed box, where you have nothing better.

ORGANIC DISEASES OF THE ŒSOPHAGUS.—This includes all the changes that might be due to some other disease; usually we find a dilatation just anterior to it, and sometimes there is a polypus or other tumor on the outside; these may be either on the inside or on the outside; when outside they press severely on the tube.

Semeiology.—Where the disease is an organic one the symptoms are very slow in their development; first would be slowness in eating, slow swallowing, swallowing painful, occasionally stops eating. These go on until choking takes place, but is limited to the tracheæ at first, and the chances are he will vomit up the matter which may show streaks of blood on it; or this runs on from bad to worse, until it ends in the organic disease.

Treatment.—Is usually quite unsatisfactory, because it is thoroughly chronic before it is known to exist. If the constriction could be anticipated, the use of the probang, well oiled, would give relief. Healing and soothing administrations of linseed tea, or solution of alum may be given in small doses; or borax in solution sometimes—in small doses; but this latter is not the proper treatment in this kind of a case, as it has a tendency to arrest secretions of the gastric juice, and will also spoil gastric juice: mucilage is good; give nourishing and very sloppy food.

DISEASES OF THE STOMACH.—The first condition we think of in connection with it is Emesis—the act of vomiting. It has been said that the horse cannot vomit, but from experience we know that, although the horse does not vomit very easily or as much as some animals, under peculiar circumstances he can vomit. Vomiting is the forcible expulsion of the contents of the stomach through the œsophagus, in response to the direct or reflex action of the streak running through the medulla oblongata. Some think that vomiting is due to some cause in the stom-

ach, but it has been proven that the stomach has nothing to do with it; that it is due to the reflex action of the medulla oblongata.

Physical action.—First, you must have a reflex action; next thing, a contraction that is a spasmodic one of the abdominal muscles, producing nausea, and added to this there is a full, deep inspiration; this forces the diaphragm down on the stomach, and as the stomach is pressed by the muscles the contents of the stomach are forced out. Before this occurs, as stated above, there is a spasmodic contraction of the stomach and also of the intestines, so that in the expelled contents of the stomach there is often seen the bile product of the bowels; as this is all being forced up, the circular muscles of the œsophagus dilate and the longitudinal ones contract, so that it is really then shorter and wider. At the same time the food is expelled there is a rush of air outward, which prevents any of the matter going down the larynx. Cattle seldom ever vomit, but in man, dog and pig it is not all uncommon; they are easier to vomit, especially the dog. The reason it is easy for human, dog or pig to vomit, is that the œsophagus dilates as it enters the stomach, which is not the case in the horse; also the stomach of the horse is so small that the food does not remain long in it, but passes rapidly out into the intestines. Canines and felines vomit on the slightest occasion; omnivorous animals are the next easiest, and herbivorous the hardest to cause to vomit.

Circumstances that cause vomiting in the horse.—First, when the stomach is distended with food, mostly solid, or distended with gas as the result of fermentation; 2d, where dilatation of the œsophagus existed at the cardiac end of it, thus rendering the region of the stomach and œsophagus irritable and weak, or Hyperesthesia of the nerves which convey it to the medulla oblongata and then back to the abdominal muscles, and nausea is produced; 3d, rupture of any of the coats of the stomach, either serous, muscular or the mucous, will produce vomiting, and it takes place after the rupture, although it may take place prior to the rupture; 4th, closing of the pyloric opening; this occurs from impaction, from eating wholly indigestible food, or not enough indigestible matter; this impaction prevents the food passing into the duodenum.

DYSPEPSIA.—This is Indigestion, Acute or Chronic, and is simply the functional derangement of the stomach. In connection with the acute we have two conditions. Gastric Flatulence and Stomach Staggers, or as better known, Blind Staggers. This Acute Indigestion is the sudden cessation of digestion whether partial or complete, and just as soon as you get suspended digestion, fermentation and decomposition take place at once; evolution of gas is inevitable and unless relieved, serious results will follow. It is often fatal in from 20 minutes to 60 hours, but if the animal lives 24 hours, he will likely recover. Most of the deaths occur in the first 6 or 7 hours.

Etiology.—Overloading the stomach or eating too fast; eating when physically exhausted; then the animal will often bolt his food. Gastric Flatulence is often due to improper feeding.

Semeiology.—Restlessness, more or less colicky pains, though the pain is not acute; horse will paw much, move around, lie down and get up soon; as fermentation takes place, the body will be found to grow larger. In Gastric Flatulency the ribs will bulge more, while the flanks

will be less than in the Intestinal Flatulency; he sweats more or less, eruptions of gas come from the stomach, and ineffectual attempts to vomit, spasmodic contractions of the neck and shoulders, same as in choke; breathing becomes labored, pulse not at first affected, but rapid and small as the disease progresses. The contraction of the neck and shoulders is an unfavorable sign, and is often followed in $\frac{1}{2}$ hour by death; death from Asphyxia may take place at any time. As Flatulency holds on, the brain often gets stupid by the pressure on the diaphragm interfering with respiration, and then venous blood is sent to the brain and the horse will often show blindness and stagger; this is when the stomach is full of solid food.

Treatment.—OF ACUTE INDIGESTION.—These cases are always urgent, and as soon as the doctor is called he should get to work at once and administer such drugs as arrest fermentation; this will stop the formation of gas. If it is a bad case we prefer hyposulphate soda, and if a mild case, bicarbonate soda. Old-fashioned treatment used to prescribe bicarbonate soda for every case and every time; we believe this to be a great error, for the contents of the stomach in these cases are always sour; there is an acid formed by fermentation, and as the bicarbonate soda is an alkali, there is great danger of producing an effervescence and forming new gas. By the old treatment, about 75 per cent of these cases died, now about 10 per cent die; that is, using hyposulphate soda instead in some cases. Turpentine is also a good remedy, being an antiseptic; sulphate soda or lime is good, so is boracic or carboic acid, also sulphuric or sulphurous ether. Then afterwards give a mild laxative or purgative, as aloes, etc. During the trouble keep the animal quiet. Hot fomentations to the belly will do no harm, or rubbing in mustard paste. Warm water and soap injections are good; they increase the peristaltic motion. Hyposulphate soda may be given in solution or may be given in bolus, which acts as well but slower than the solution; may give of this 4 to 8 oz. to a large horse, but we find that if about 2 oz. does not do good in about 15 minutes, giving another dose of the same amount gives better results than the large dose all at once. Bicarbonate soda will cause vomiting, and may be the cause of rupturing the stomach, in a few minutes after giving, and may lead to Gastritis; yet most of the text books recommend it. Suppose the stomach is full of solid food, as when he gets into an oat bin; drench with hyposulphate soda and linseed tea; it is good to add to this or give after, nuxvomica, whisky or strychnine; always dilute the whisky. Also give anodynes in liberal doses, as sulphuric ether; we have 1 oz. of it in our Colic drench; it is antispasmodic also. The next best to sulphuric ether is chloral hydrate; give of it $\frac{1}{2}$ dr. to 2 oz. water. We generally object to the use of laudanum; morphine (4 gr.) may be given hypodermically. In this trouble there is likely to be a closure of the pylorus, and after giving an anodyne you will notice a gas coming from the anus; but if the impaction is from solid food no need to give anodynes,—chemicals are the things you want. If Flatulency begins you will need chemicals; hyposulphate soda, 6 to 8 oz. to the quart, or 1 and $\frac{1}{2}$ quarts of water, is good. Always dilute hyposulphate soda largely. As a purgative give sulphate of magnesia. In case the horse has become too stupid to swallow, then use a hose; if he is in coma, then inject atropine or strychnine. The old authors believed in bleeding; we know in this dis-

ease there is an anæmic condition of the brain instead of a congestion, so think that bleeding is the wrong treatment. Anæmia produces or rather induces sleep, and Congestion of the brain produces delirium.

Prophylactic Treatment.—Prevention.—We find that where there is a repetition of these troubles, each time it is worse, so when called, attend to the hygiene; feed every 6 hours regularly; arrange it so the horse cannot eat too fast or too much; give him from $\frac{1}{2}$ to 1 hour to eat. Most of the cases we have occur in the night after a hard day's work and exhaustion, and the horse eats voraciously or does not masticate his food properly, etc.

CHRONIC INDIGESTION.—Known as Dyspepsia in man; is a functional derangement of the stomach; this comes on slowly and requires a long time to cure. During its existence it is not serious or dangerous; that is, in the ordinary case.

Etiology.—There are three influences that operate to produce it. First, errors in feeding; second, changes in the gastric and other secretions; these are more faulty physiological developments as to anæmia, etc.; third, abnormalities affecting the movements of the stomach, such as cancerous and other growths.

Semeiology.—Usually a capricious appetite, sometimes hungry, sometimes no appetite; an unnatural thirst, unnatural hunger for alkalies, will eat the mortar from between the bricks, lick the walls, eat the bedding he has urinated upon, eat clay in large quantities, even at times eat their own dung; all shows a tendency to Indigestion, hence the animals desire to obtain alkali. The limit to their thirst is their capacity; will often turn up their upper lip, in bad cases. The excessive drinking induces Diabetes Insipidus. As the disease runs on, the coat becomes staring and rough, the animal thin and pot-bellied; sweats; there is palpitation of the heart.

Treatment.—Give complete change of food,—grass is the best of all; limit the quantity of water to $\frac{1}{2}$ pail four or five times a day. You can assist nature by adding or dissolving 1 dr. bicarbonate soda in a bucket of drinking water; good to give Fowler's solution of arsenic or arsenicum, 2 gr. first, then 3, then 4 twice a day; add to it 1 dr. nux vomica to each dose; also 1 dr. gentian root pulv. and 1 dr. powdered hydrastis, and 1 dr. powdered wood charcoal; continue 2 or 3 months if necessary; prescribe more bran and less oats; more exercise and a generous amount of salt. In old horses with chronic Indigestion, give mineral acids, as nitric or hydrochloric; I prefer sulphuric acid; in the following prescription: acid sulph. 1 dr., tr. gentian 4 oz., aqua ad. to make pint, Dose: 2 oz. night and morning, or twice a day. This active tonic stimulates the liver and acts very nicely on the stomach; where gastric secretions are faulty, we sometimes add 10 gr. quinine to this dose, especially following a debilitating disease; glycerine may be added also. If you make a fluid preparation, add glycerine in $\frac{1}{2}$ to 1 oz. doses. Good idea to examine the teeth to see if they may be a cause. In dogs we find chronic Indigestion with constant vomiting and increased thirst, it is benefited by giving 5 to 10 grs. sub nitrate of bismuth. We take the English setter as the type; this is the size dose we give, according to the age and size of the dog. A little bicarbonate soda in drinking water is good and will not produce diabetes as in the horse. If the dog is run down, give as tonic preparation of U. S. P.—

elixir cal. iron and bismuth 2 oz., glycerine 1 oz., aqua ad to make 4 oz. Dose: dessert spoonfull 3 or 4 times a day. This is good for Indigestion and the bismuth quiets the stomach.

GASTRITIS.—Inflammation of the stomach, is usually seen in the acute form, and has a tendency to cause death in a few hours; but when it is in the mild form it may run on to chronic, then tends to a softening and other changes, particularly in the pyloric tract, also other portions of the stomach. The acute is comparatively uncommon, and when in the horse, tends to Enteritis. The dog is more liable to Enteritis because so susceptible to poisoning.

Etiology.—Generally follows an acute attack of Indigestion; next cause is poisoning, as from caustics, also from wounding of the lining of the stomach as by foreign bodies.

Semeiology.—Following an acute attack of Indigestion there are colicky pains, and in case of Gastritis there is a tendency to grow worse, in spite of all you may do; the animal sweats, grows weak, presents a very depressed countenance; Flatulency from acute Indigestion continues; sour eruptions, breathing increases, pulse hard and rapid, temperature high; next day may find the pulse wiry, a loathing for food; after running for several hours there is an acute thirst. If it follows poisoning, the mucous membranes are injected, the mouth often filled with a ropy saliva, due to irritation of the salivary glands by the gas; stomach and bowels usually inactive, great weakness develops rapidly, and in this case dies in from 2 to 6 hours; he drops and dies suddenly. The course this disease runs is according to the cause that induces it. In poisoning, as from caustic potash or blue vitriol, will run a comparatively short time and shows much thirst. In the dog, in this case there is severe retching, elevation of temperature, and will vomit up everything.

Treatment.—In the horse we find it almost invariably fatal; all you can do is to give rational treatment according to the symptoms presented; gum opium in liberal doses is recommended. Remember that in such troubles of the stomach and bowels, you can give large doses of opium without much effect; give antiseptics. If the trouble is from poisoning, try to find out the kind of poison and apply the antidote; give raw eggs beaten up in milk, give olive or cottonseed oil and apply counter irritation over the stomach in every case. If he does not die in a few hours give lime water, and if you can't get lime water, then sub nitrate of bismuth 1 dr. 3 or 4 times a day will do the horse good; give in drench or bolus. For dog, give from 5 to 10 grs; also very small doses of belladonna; also anodynes, as hyosciamus, laudanum, etc. Restrict to milk diet; then after a few days, mutton broth; give lime water or a solution of bicarbonate of soda in water, just enough to make it slightly anti-acid. In autopsy on the horse in gastric poisoning, you will find patches of erosions and inflammation; from arsenic poisoning, all the surface will be inflamed; in case it follows acute Indigestion, we usually find a diffused inflammation, more particularly of the pyloric tract. Chronic Gastritis often succeeds an acute attack, and seems to come on very slowly; in such a case it is the result of long continued errors in feeding. Usually we learn that there has been frequent occurring attacks of Indigestion; second, Flatulency; third, textural changes in the glands themselves, due to the errors in feeding; fourth, malignant disease of the stomach, in the

form of cancer or degeneration of the mucous of the stomach; fifth, mechanical injury, through the equine larvæ or bots.

Semeiology.—Symptoms are mild as compared to the acute form; capricious appetite, great thirst, more or less fever, may run into the acute form in from 6 to 10 days.

Treatment.—Pay particular attention to the diet; give small doses and long continued, what we think the case requires; run on grass if possible; give belladonna, hydrastis, gentian, arsenic. Where there are gastric pains, sometimes as a result in the stomach there is a rupture of the walls—may be partial or complete; may be either the serous, muscular or mucous coat, or all of them. The muscular usually ruptures first, then the serous, and last the mucous; it frequently occurs in horses when tossing about in suffering from Gastritis. Sometimes the rupture occurs when the animal falls to die, so bear this in mind when making an autopsy. If it occurs during Flatulency, it is usually small; if from the fall, may be from a foot to 1 and $\frac{1}{2}$ feet long. We find that draft horses are more liable than others; they eat more, and are more prone to Gastric Flatulency.

ETIOLOGY OF GASTRIC FLATULENCY.—The cause that produces it may be put down as the only cause; after the rupture inflammation begins at once, so you can often tell about the time the rupture took place by the appearance of the edges.

Semeiology.—Vomiting almost invariable, but not infallible, yet it is not a diagnostic symptom. There is sudden and severe prostration, cold, wet surface, nausea, inclination to sit on the haunches and attempts of vomiting; weak, hard, small pulse; often after the rupture, if there had been severe pain previous, there may be a sudden cessation, then it is nearly safe to say that rupture has taken place. As death approaches the mouth and extremities grow cold, black mucous membrane, according to the size of the rupture, death may come in from a few minutes up to 60 hours; that depends on the violence of the Gastric Flatulency before the rupture. Animal may even live quite a while, say from 3 to 4 days after the food has passed into the abdominal cavity, then usually dies of Peritonitis.

Treatment.—There is no treatment for rupture of the stomach, only treat rationally on account of our inability to tell that the stomach has ruptured. Treat right along as the case may call for; the only proof positive is autopsy, so be in no hurry to make a positive diagnosis. When the horse dies suddenly from any cause—say in the country horse, autopsy made after 5 or 6 hours shows that digestion has been going on the same as in life, for when ante-mortem digestion ceases, post-mortem goes on until the gastric juice is all used up, for it acts as well after death as before. Little points of inflammation start, and people say the bots caused it by eating those holes, but bots are fastened by their tails to the stomach and cannot eat the walls, hence are not the cause at all.

CONSTIPATION.—This is a condition of the bowels in which the fæces are unnaturally retained, or if discharged, are hard, dry and scanty. It is a simple matter, but occasionally gives rise to other troubles that may prove fatal. The large bowels are the ones usually affected, chiefly the colon, spoken of in this case as impaction of the colon, which is very serious, especially in heavy horses. In cattle it is usually spoken of as impaction of the omasum.

Etiology.—As a primary lesion it is the result of feeding on bulky, innutritious food, especially that of woody fibres, as straw fed in farm-yards in Winter; and this cause may be aggravated by a short supply of water; second, by deficient peristaltic motion, due to impaired nerve force; third, deficient secretion of the mucous in the bowels, or excessive absorption of the fluids into the food.

Semeiology.—Comes on gradually, usually associated with an unthrifty condition, and in such condition are usually pot-bellied, have a long rough coat, thin in flesh, not strong, but lazy and stupid; fæces passed with difficulty, and in small quantities. As the Constipation develops, the lining of the rectum is injected a deep red color, the animal gets uneasy and stretches out the legs, this is more so in sheep, mouth often soapy to the feel, and with a fetid smell; the horse will strain occasionally as though trying to have a passage. As the fæces becomes constipated the bowels become congested, and this leads to colicky pains, and if not relieved will ultimately end in inflammation of the bowels; this may develop in from 4 to 5 days; the colon in this case becomes overloaded, then paralyzed, and if it be not relieved in from 24 hours to 5 or 6 days, may run into Enteritis and death. By placing your ear to the side you will find an absence of the peristaltic sounds; this is a positive proof of the impaction of the colon. Another proof is the way the animal backs up against the wall or a post, and rubs and pushes backwards. We often see young animals when born, suffering from the meconium, that is, unable to have the first operation, and runs into Constipation; this is usually attributed to the dry condition of the mother, noticed particularly when the mare has been worked too hard and up to within a few days of the birth; and on high feed, and also doing more or less sweating.

Treatment.—In impaction of the colon, naturally a purgative is indicated; what to give is largely a matter of taste. In very mild form an aloes ball does very well, and soft food; but if it is a bad case, we consider that oleaginous substances are the best and may be given in comparatively large doses, say a quart at a time, or rather to start with, and we usually repeat it twice a day; so in the course of a few days he has a large quantity of oil down, but that will not hurt him. We give oil because there is an indication of inflammation of the bowels and the oil will not tend to increase it as aloes might. Sulphate magnesia is a popular remedy for cattle; for swine give castor oil, same to dogs; buck-horn for cats; cascara may be given to any animal; in addition to this, injections of water and soap (castile) are invaluable, poured into the rectum gently; where you have no syringe use a piece of hose. Another injection is glycerine diluted $\frac{1}{2}$ with water. If you need to repeat the water and soap, each time lessen the amount of soap as it may have a tendency to inflame the bowels. If the case does not improve after you give the aloes, then you may pour down on the top of it $\frac{1}{2}$ lb. of magnesia in solution, or one pint of oil and repeat in 12 hours. Never repeat a dose of aloes in less than 4 days, but the oil is harmless; and bear in mind that if the impaction is not relieved the animal will die. Some practitioners give some stimulant to the bowels, as solution of strychnine, fl. ext. of calabar bean, sulph. ether, aromatic spts. ammonia, or whisky.

The alkaloids of calabar bean, Eserine and Calabarine, are

becoming very popular. Calabar bean in all its preparations acts as a stimulant to the nerve fibers of the spinal cord, especially those over the bowels, and particularly the colon. Eserine is usually dissolved in alcohol and administered either hypodermically or into the trachea; dose varies from $\frac{1}{4}$ to 2 grs., I think that from $\frac{1}{3}$ to $\frac{1}{2}$ gr. is best. Eserine may be dissolved in alcohol and carried around in the pocket; it does not lose its force then, as it does when dissolved in water,—the proportion is about 1 gr. to 1 dr. of alcohol. If administered by injecting into the trachea, one half the dose used hypodermically will do, and if into the jugular, then one half that for the trachea. You will find that in any case where alkaloids are used, the pain is increased; but if the drug is administered early, that need not be noticed. Suppose we have a case running four or five days, repeat the oil every twelve or fifteen hours; in addition to this, bear in mind that the pulse is increased to sixty or sixty five; temperature elevated—may be 103: begins to sweat; we recognize that the horse is in a dangerous condition; pulse may run up to 80 or 85, temperature from 104 upward; usually death then soon occurs. In addition to purgative, give small doses of aconite, and rather liberal doses of belladonna combined with some stimulant and anodyne.

R	Aconite rd. fl. ext.	40 drops,
	Belladonna fl. ext.	1 oz.,
	Hyosciamus fl. ext.	2 oz.,
	Spts. nit. ether	2 oz.

Aqua ad. to make one pint. Give 2 ozs. every four hours. Keep horse quiet, and give in addition to this, from $\frac{1}{2}$ to 1 oz. of cannabis indica. Water precipitates this, so if you want to combine it in the prescription you will have to use simple syrup instead of water. Counter-irritants are almost invaluable; we use mustard and repeat in from every two to ten hours, according to the severity of the case. If mustard, etc. don't give relief in three or four days, apply croton liniment, such as croton oil one part, linseed seven parts, but don't repeat this. Eserine is also dangerous to repeat if given in large doses, but if in less than 1 gr. repeat half the dose in one hour if not relieved. In little animals, injections do very well, as glycerine diluted one half with water; for adult, 2 oz. glycerine, aqua 2 oz.; for little animals 1 or 2 oz., or inject olive oil, linseed or water, and if this does not suffice, give olive oil 4 ozs. to foal, or 2 oz. New Orleans molasses. Don't use the hand to remove the fæces. Dogs you can dose with castor oil and repeat in large quantities same as in the horse; if the stomach won't retain it, give a little bismuth. Sometimes on account of the fæces getting so hard and in such a large mass, it must be taken out with the use of the forceps—first locate the mass, and be careful not to injure the lining of the intestines. If pain is not severe, exercise animal.

DIARRHŒA.—This is an unnatural fluid condition of the fæces; it is either a peculiar functional disturbance, or a symptom of some other trouble; the latter is Superpurgation. We find that Diarrhœa is quite a symptom of other diseases, as Rinderpest, and contagious Pleuro-Pneumonia in cattle.

Etiology.—As a disease in itself, it is a peculiar increased peristaltic motion, and in addition to this, as a result of the irritation, we get a vastly increased amount of water into the bowels, and there is a rapid

evacuation of water from the system. It is generally some local irritation in the bowels that causes the trouble, as indigestible food and parasites, mechanical and chemical irritations, laxative food in too large quantities; ice water in hot weather is a cause in man. Cold water of itself in large quantities often causes a Diarrhœa that may run a rapid course and terminate fatally in a short time. Local tissue changes in the stomach or bowels is a functional derangement of the liver, due to some excessive stimulant, causing the bile to flow. Foul stagnant water is among the causes, and all these causes work more severely when the animal is exhausted or overheated, or when in a plethoric condition. If the horse is overheated, will cause a mild form of Diarrhœa. Chronic Diarrhœa is known as Scours.

Semeiology.—In this watery condition of the fæces they are usually gray or yellow; the gray may run into a dirty brown, and usually indicates that there is an insufficient quantity of bile, which is caused by allowing too great activity in the bowels. This gray may be fetid; the bright yellow is due to excessive bile; this latter kind of fæces usually scalds the anus as it passes out, causing considerable pain. In the early stage there is no constitutional disturbance, but as the disease increases the pulse increases and the temperature falls below normal; as it runs on, the lining of the rectum becomes a darker red and the appetite is usually lost. As it runs on to a fatal termination, the pulse becomes wiry, hard and weak, finally imperceptible, and as the water runs through the bowels the thirst increases; the animal becomes emaciated very rapidly; as death approaches the mouth becomes cold and clammy, ears, nose and extremities get cold, and a clammy sweat breaks over the body; the mouth may be offensive, there is an anxious expression of countenance, the horse becomes weaker, and finally dies of collapse—syncope.

Chronic Form.—Usually seen in the horse when out a little time; he was all right in the stable, but when driven an hour or so may begin to scour. Sometimes this chronic form stops of itself, at other times may be incurable. Parasites that cause Diarrhœa are *Ascarides*, *Teres Lumbrici*, and *Strongylus Tetracanthus*—which are the worst of them all, and often exist by the millions; the others are larger but exist in less numbers. This one killed more colts last year than all the other diseases, that is in the state of Illinois. It seems to come like the locust pest—periodically. It is usually found in the colon and rectum.

SUPERPURGATION.—Does not differ very materially from Diarrhœa, but is more severe and is caused by the injudicious repetition of a purging dose; it is more rapid and more sure of a fatal termination. About the only cause of Diarrhœa in small animals, we might say, is Indigestion, from eating too much or going too long without food, then overloading their stomachs when they get their meals, then there is an insufficiency of the gastric juice. Another fact is, that the mare may be overworked while the colt is left in the stable, then the milk becomes heated and causes Diarrhœa in the colt. A nursing animal should not go longer than two hours at a time without feeding. The character of the food also affects the colt; this is also the same in the human family,—the mother's milk may become changed and the baby is affected. In Diarrhœa in the young, there is considerable straining, cramp and colicky pains. Where it is a mild case and does not run on to a fatal termina-

tion, the colt is not lively, coat long and rough, pot-bellied, thin, and is unthrifty in general. In long continued Diarrhœa, in autopsy we find there is a dark-colored fluid in the peritoneum cavity. In Diarrhœa, where it has run three or four days, you will find in autopsy, patches of ecchymosis over the peritoneum, showing an excessively prostrated condition. The glands are often brown, softened and enlarged; these are the lymphatics. The bowels are contracted, and their lining has a catarrhal coating over them. Caustic substances often cause Diarrhœa, and then erosion of the bowels is seen, as in arsenic poisoning; the arsenic being administered slowly, that is, for 2 or 3 days. Diarrhœa in young animals often run a rapid course, and if not relieved they may die in a few hours.

Treatment.—Put in good, comfortable stall, clothe warmly, and if necessary give artificial heat; keep perfectly quiet; ascertain the cause if possible and remove it. On account of excessive thirst restrict the water supply; put anti-acids in his drinking water, as lime water or bicarbonate soda, 1 dram to the gallon of water. Then give linseed tea, or gruel, or starch gruel; they are soothing to the mucous membranes. Give the animal boiled oats if he eats, and in moderately bad cases, give dry bran; but over all, drench with starch gruel or flour, or give wheat flour, 1 pound in a gallon of water. In addition to this, it is well to give prepared chalk or lime water, for remember the stomach is acid in all these cases. If there is cramp and straining, give anodynes; OPIUM is the best remedy, either in the gum, powder, or tincture. The pain in the rectum is often excessive; laudanum, opium, or starch gruel may be given—1 quart of the gruel and 1 oz. laudanum; this is particularly good for the young, and is to be injected. In the adult animal use 2 ozs. of the laudanum; often a single injection gives relief. To young pigs you can give from $\frac{1}{2}$ to 1 teaspoonful and it would be harmless. If the prostration is very great, give stimulants, as sulphuric ether, whisky or brandy, in doses according to the size of the animal, and repeat according to the amount of prostration. Dogs we treat much the same, but we find sub. nit. bismuth is the best; the dose for a 40 lb. setter, one year old, would be 10 gr. repeated three times a day; the same dose is for the human.

In case of excessive pain, counter-irritants are the thing; soap liniment is good; hypodermic injections of morphia, if the cramp is severe. Where indigestible food is the cause, it is often necessary to give a laxative before we can effect a cure; in such a case give oil,—linseed oil is very good for cattle and sheep; castor oil for human, dogs and pigs. Sometimes we add stimulants, as nux vomica, gentian, cascara, etc.; stomachic in the form of ginger, camphor, whisky. If it runs on three or four days, astringents may do good; spirits of camphor given alone often gives good results, or

R	Tr. Opii	1 oz.
	Tr. Catechu	1 oz.
	Spirits Camphor	1 oz.
	Ether Sulph.	1 oz.

Add starch gruel to make 1 pint,—this is one dose for the horse; repeat in five or six hours. Or give

R	Creta Prep.	1 oz.
	Zingiber Pulv.	1 oz.
	Gum Camphor	1 dr.

Gruel to make one pint; this is one dose. These may be repeated three times a day or more. Tinct. rhubarb is usually given to regulate the liver,—this is only necessary with young animals living on milk; dose 1 to 2 drams; can combine catechu tr. with it, as for foals about one month old.

R	Tr. Rhubarb rt.	1 dr.
	Tr. Catechu	1 dr.
	Tr. Opii	1 dr.
	Camphor	1 dr.

Missura creta 2 to 4 drams; this is one dose and can be repeated 2 or 3 times a day. This missura creta is good in human practice; often alone it is fine. We find that strong coffee may be given to adults where the prostration is great; give in liberal quantities; for the young, give port wine and whisky. Don't stop the Diarrhœa too quick, or it may cause reflex action of the stomach, so give small doses and repeat it as necessary.

CHRONIC DIARRHŒA TREATMENT.—The first thing is regulation of the diet; give concentrated food, good hay and oats to draw up the belly, and by giving small amount of hay and liberal quantities of oats will be benefited. Limit the amount of water to half bucket at a time, four or five times a day. Tonics are indicated; sulph. iron, add a little nux vomica or gentian,—continue this two or three months. Charcoal, arsenic, but the iron is the most important. We find astringents to be very good, powdered white oak bark, from half to one tea-cupful twice a day; also give anti-acids. Bicarbonate of soda is very good; iron is very good, given night and morning.

SPASMODIC COLIC.—Colic is a powerful effort of the bowels, a spasmodic effort, by which nature tries to remove some irritant, and is unaccompanied with fever or inflammation. There are two kinds—Spasmodic and Flatulent. Spasmodic Colic is a violent chronic spasm of the muscular coat of the bowels; the irritant that produces the spasm is applied to the muscular coat, and so irritates it that it produces Hyperesthesia, due to over stimulation. The spasm is sharp and excessively painful, and subsides after a minute or two, but only to return again with greater force; this characterizes the disease as Spasmodic Colic. It usually terminates favorably by resolution, and by removal of the cause; the whole trouble often disappears as suddenly as it came. If the cause is not removed it may run on to chronic, then resulting in inflammation and death.

Etiology.—Errors in dieting are the most prolific causes, as improper food, improper quantities, improper time, irregular feeding, inferior food, bolting the food without proper salivation, drinking large draughts of water after eating, thus washing the food out of the stomach into the bowels before the gastric juice has acted upon it; this cause is irritating to the bowels; eating when much exhausted, as in Gastric Flatulency; drinking large draughts of very cold water. Then other causes are calculi; a calculus is sometimes lodged in pockets in the bowels, and becoming loosened, causes very severe pains and is very irritating. Calculi seem to do no harm while they are fixed, and not till they are loosened do they cause the trouble. Sometimes these balls are composed of dust; these do less harm than other kinds, yet they are irritating. Parasitic elements are also quite productive of this trouble, such as the *Teres Lumbricæ*,

Strongylus Tetracanthus, *Ascarides*, and most particular, the *Strongylus Armatus*, which have sword-like arms with which they can bore their way through the tissues; they originate in the bowels, and find their way into the colic and mesenteric arteries. Often they are in great numbers, and sometimes when tapping the intestinal cavity in Ascites, they come out in the serum in great numbers. They may be from $\frac{1}{16}$ of an inch to 2 and $\frac{1}{2}$ inches long; that is $\frac{1}{8}$ inch in diameter. When this worm gets into the blood vessels it causes severe pains, and the animal usually dies from Thrombosis. Organic disorder of the glands of the intestines may cause Colic; exposure and cold drenching, or showering horses' bellies may cause colicky pains.

Semeiology.—It may come on suddenly, especially if due to heavy draughts of cold water, as that chills the bowels suddenly; but if due to the food, it may be several days coming on, and as soon as it begins there will be uneasiness on the part of the horse; he will look back at the side, move forward and back, paw a little, lie down and roll, get up quickly, will make efforts to lie on his back while down; in bad cases will sweat, throw himself violently on the floor, or drop recklessly, drop in a heap, roll and kick furiously; the bowels will become accelerated, due to these active exertions. The spasm will naturally subside; then the pulse and respiration, which were increased only by the exertions, will return to the normal, and the animal will be quite comfortable until the next cramp comes on. Another sign when caused by the food, the horse will turn up the upper lip as though in nausea. Under favorable circumstances or cases, the spasms subside and the horse gets well, but if the cause of the irritation is not removed then it will run into Enteritis. There is no marked elevation in temperature. When pain increases pulse get hard. Another cause is retention of the urine for a long time, due to the spasmodic contraction of the neck of the bladder; this is a very rare cause. It often comes on from some peculiarity of the horse, such as will not urinate on the bare floor, some will not while in harness, so they carry their urine until it becomes irritating. The fæces are sometimes hard, small and scant in these cases, and the pulse is usually irritable. There is a difference between the trouble in the large and the small intestines; if in the large they will be more like those seen in impaction of the colon, but if in the small intestines, the symptoms will be as those just given. Pain in small bowels is more severe than in large ones, therefore symptoms in large ones are very much less violent. He will stretch and back up against objects.

Treatment.—Bear in mind that bowel troubles are always serious; Colic is peculiarly urgent because it is so painful, and also because the disease may get well of itself if you don't hurry, as it sometimes does, so lose no time when you are called to treat a Colic case. About 75 per cent of Spasmodic Colic cases will get well if left to themselves; the first thing to do is to give the horse plenty of room; if no other way, take out of doors; then administer such drugs as will relieve pain and act as a diffusive liniment; give diffusive stimulants, as ether, alcohol, spts. ammonia, whisky. Anodynes that are useful are chloral, most important, *sulph. ether*, *cannabis indica*, and in extreme cases *morphia*. Aconite is looked upon as a fairly good remedy; it is antispasmodic. The old-fashioned way was to give opium, but we think it is contra indicated because it

has a tendency to allay the cramp and spasmodic contraction of the bowels, and this should not be done because it is by this action of the bowels that nature is endeavoring to throw off the irritating substance, so we want the vermicular motion to go on instead of being stopped. We think that 75 per cent of the cases that die treated with opium, would recover if it was not given in this trouble. The drench that we use is

R	Belladonna Fl. Ext.	½ dr.
	Physostigma Fl. Ext.	1 dr.
	Sod. Hyposulphate	1 oz.
	Ether	1 oz.

Aqua ad. q s. to make one half pint. Give this as one dose, and if necessary repeat in from fifteen minutes to half hour. Give large dose of oil; tobacco per rectum is good. Belladonna regulates the circulation, contracts the arteries, strengthens the beats of the heart and prevents congestion. Calababean acts on the spinal cord, especially that portion which presides over the bowels; it has much the same effect as its alkaloid—eserine; it helps peristaltic motion, especially of the large intestines. Soda hyposulph. prevents fermentation and sweetens the bowels, and is slightly laxative; sulph. ether is a stimulant and an anodyne; Dr. McEachran's is tinct. opium and spts. nit. ether, 2 ozs. of each, add water to make ½ pint; this is one dose. This is irrational. Hypodermic injections of eserine or morphine may be used; socotrine aloes may be given. Our drench will not decompose; chloral hydrate will decompose if left long made; the spts. nit. ether and hyposulph. sodium form a caustic substance. There is always danger when using the hypodermic needle, from some germ being on it if not thoroughly cleaned. It is a good idea to give freely of anodynes to keep the animal from rolling and throwing himself, so give freely; when the case is not too severe, exercise will often assist in removing the cause, but it is cruel when the horse is suffering severely. During recovery, give rest and change of food. If you are caught in a place where you cannot get anything in drugs that you need, then you will find that a piece of tobacco tied to the bit so the horse will swallow the juice, will prove a good remedy.

FLATULENT COLIC—INTESTINAL FLATULENCE.—This is much the same as Spasmodic Colic, and in addition to the pain, the bowels are distended with gas. This is due to the fermentation of the undigested food, also the Flatulency that accompanies Enteritis; also that accompanying impaction of the colon, but in these last two it is not so distressing usually. We are also inclined to think that Intestinal Flatulency is not so painful as Spasmodic Colic, and is caused more by the distension of the bowels than by cramp; but the danger is greater—nearly as great as from Gastric Flatulency, or, perhaps more so, because in this case there is no chance for the gas to escape, consequently there is great pressure upon the diaphragm, causing Asphyxia and death; in excessive distension, rupture of diaphragm. In some cases we find the rectum protruding from two to eight inches out of the anus.

Diagnosis.—We find the flanks distended and drum-like between the flanks and the last rib, and this will show in different animals according to the length between the hip and the last rib; the longer they are the plainer will show the drum-like appearance. The long ones are the fortunate ones, because the length allows space for the swelling; while in

the shorter coupled horses the swelling may press against the diaphragm, suffocating them much easier than it would those of the other conformation. So in looking over a case, we are often led astray in the short horse by the swelling not being apparent, and at the same time the Dyspnœa is always greater in the short than in the long horse. We find there is danger of rupture of the intestines or intestinal walls; also of the diaphragm. Then, if neither of these occurs, the horse may still die from great prostration.

Treatment—Is more or less difficult, because we cannot reach the seat of the trouble with medicine. Chemical agents are held in variable estimation by different practitioners, but we use hyposulph. soda, also bicarbonate soda—this one when it reaches the place of the trouble, has been robbed of its alkaloid. Carbonate ammonia, wood charcoal, carbolic acid, or any other antiseptic may be used. *The best thing for the trouble is oil of turpentine*, as it is quickly taken up by the blood vessels; it is said that in 15 minutes after giving you can detect it in the urine; it is an anti-ferment and anti-acid. Usually we give in ounce doses in half pint of oil, then it is always advisable to give anodynes and liberally; this is to relieve pain and to relax the parts, but the passage to the place is so obstructed by the bowels pressing upon themselves that it is often impossible to reach the point needed; this pressure also prevents the escape of the gas. Turpentine stimulates the heart—don't forget the anodynes. Lobelia is highly esteemed; also chloroform, chloral hydrate, sulphuric acid and tobacco, especially tobacco smoke. Stimulating injections are often very beneficial; we often give 2 ozs. of glycerine in 2 ozs. of water, per rectum; soap and water injections are also good when the rectum is not protruding too far. Always be careful in injecting that you do not puncture the rectum—be very gentle in passing in your tube. Eserine is very good in this case; many try it with nothing else, but I think it had better be given in small doses, as it produces the greatest pain. It increases the pain about ten times after about 15 minutes, and for about 15 minutes; this is due to the sudden firm contraction of the bowels, and if there is no congestion or inflammation it will do no harm, but if there is any it may prove fatal. So I think it should be given early, and I would rather give in $\frac{1}{2}$ gr. doses than in 1 or $1\frac{1}{2}$ grs. Don't think that pylocarpine is any good; the trocar is the most reliable of all, and we always carry one in our pocket, as at the time you need it there will be no time to go for one. A horse may often be saved when he is about dying, by tapping, and we know from experience that there is no danger from it. You may tap when there is great Dyspnœa, but if there is none I would not tap; but when the horse is suffering greatly from Dyspnœa, do not hesitate too long—that is, until great prostration has set in, when it may not do much good. You may tap on either side, but the best results are from the right side, about two inches back from the last rib, and about its middle, or even at the lower third. Clip off the hair from a spot about the size of your finger nail; then, with a scalpel, cut through the skin about $\frac{3}{8}$ of an inch deep and $\frac{3}{8}$ of an inch long; then point your trocar *inward, downward and forward*. Stand at arm's length for fear of kicks, push the trocar in as far as the ferule, pull out, and leave the cannula in.

There are two kinds of gas formed in these cases; one is carburetted

hydrogen, which will burn, and the carbon dioxide, which will not burn. If you do not enter the bowel, then draw out the trocar, all but an inch of it, and then push it in in another direction, but never straight in. I have had to tap as often as seven times before the horse was cured. Immediately after tapping use your medicine. Nine out of ten times tapping will give relief, but your work is not done after it, so continue your treatment. Never leave the cannula in longer than a few minutes, for if left in, maybe for only five minutes, nature begins to throw out an exudate around the punctured edges, and this will fasten around the cannula and may cause a fistula in the intestines; or some of the contents of the bowel may drop into the abdominal cavity and cause Enteritis. Also always place your finger over the opening of the cannula when withdrawing it; this prevents the contents dropping out into the abdominal cavity. Always use the small trocar for the horse and the large one for cattle, because you tap into the bowel of the horse, and into the rumen in cattle; also the horse is more vascular, and the nerve supply is greater. If you have to repeat the tapping, never tap in the same opening; you avoid striking the kidneys by not going in straight, and the bladder by not going in backwards. You are apt to strike the colic or mesenteric arteries, but there is no way to be sure how to avoid them; if you strike one the blood will flow out of the cannula; don't get scared, but draw out the cannula part way and insert the trocar in another direction; I have struck them and never had any bad result follow, as blood does not cause inflammation in the cavity. The untoward results that may follow are, Peritonitis, Tetanus, abscess in the mesentery, or in the walls outside of the peritoneum, and Intestinal Fistula. Peritonitis, by the contents of the bowel passing out into the abdominal cavity; this can be told by the juice coming out of the cannula; Tetanus, on account of the Tetanus germ getting into the wound; put lard on outside of hole, if you think horse is liable to get tetanic; abscesses in the mesenteric by the trocar going into it.

SEMEIOLOGY OF ABSCESS.—Back arched, belly drawn up, pulse increased. Four to six days after tapping, make a rectal examination with the hand; if the abscess is near the surface it can be felt by the hand easily; it should be tapped. The abscess outside may be caused by a dirty trocar, or by hair passing in with the cannula, or the intestinal juice may drop off into the cavity; these are unfortunately too common; with this there is pain on pressure. Cut down through the original opening, locate the abscess and bear it downward, then tap in the bottom—one, two or three times, no harm; then insert a piece of oakum into the opening, the large one, first dusting it with iodoform. These abscesses may work down as far as the stifle, if let run long; in this case you can cut quite boldly.

The Intestinal Fistula is recognized by the offensive and unsightly discharge through the opening. The best treatment we have for this is cauterizing; if less than three weeks old, I would try peroxide of hydrogen, and close the external opening; if running long enough to form a pipe, we cauterize by shooting down sulphate copper, 1 oz. to the pint of water—say 1 dr. at a time, and close the opening with a plug; after four or five days take out the plug and see if stopped; if not, repeat with a little weaker solution, and close as before. On account of

the possibility of these bad results, many or some do not like to have their horses tapped, so only fall back on it as a last resort; some pour hyposulphate soda down the cannula to prevent a return of the Flatulency. Tapping is the best treatment in the case of the ox. In their case always tap on the left side, and always a little lower down than in the horse, and in the same direction as in the horse.

INTESTINAL OBSTRUCTIONS.—1st, *Calculi*; 2d, *Hernia and Strangulation*; 3d, *Stricture*; 4th, *Alteration of the Position*; 5th, *Intussusception*. Disturbances which these obstructions produce; sometimes the obstructions themselves are the result of some previous deranged condition. *Calculi* are recognized of two kinds—the hard and the soft; the soft are formed with dust, hair, etc. *Calculi* are usually harmless as long as they remain in their pockets, but as soon as one loosens it will cause a bagging of the part; as it grows heavy it will bag the more, and as the walls increase in thickness they decrease in sensibility. When a calculus rolls from its pocket it proves a very serious thing, and does great harm, often causing death. The solid ones are composed of lime and magnesia, mostly lime, the calcareous matter in the food forming around the nuclei.

HERNIA AND STRANGULATION.—This is defined as a protrusion of the bowels through an improperly closed umbilical, causing Umbilical Hernia. It always occurs in young animals; it is sometimes the omentum, other times the bowel itself. Sometimes it passes through the abdominal ring, then we have Inguinal Hernia; this is usually seen only in entire males. When the bowel passes through a rupture of the abdominal wall, we call it Ventral Hernia, in which case the skin alone holds it from falling to the ground. It is usually caused by kicks from other horses, getting horned, or from falls on the ice. In case of rupture of the diaphragm, the bowels may pass into the chest, called Diaphragmatic Hernia, and is generally a rupture of the muscular portion of the diaphragm. When the bowel in Inguinal Hernia passes clear down into the scrotum, then it is Scrotal Hernia; this can only occur in the male.

Etiology.—If the bowel in protruding is placed so there is no chance for free passage of the fæces and free circulation of the blood, Strangulation takes place with the results, first, the bowel swells, due to the congestion induced by the interference of the circulation; if very severe, the bowel will turn black and die in a few hours—then it is only a question of time till the animal dies. This rupture may have occurred a year before, but not so that there was any interference to the fæcal matter or the circulation. If it comes from hardening of the fæces or from pressure on the outside, it may take it from ten to fifteen days to do any harm. Umbilical Hernia is very common in colts, lambs, sheep and in babies, not so often in calves. Ventral Hernia is generally seen in cattle, seldom ever in horses. Diaphragmatic from its nature, is necessarily fatal, but horses may die showing the peculiar signs or symptoms of Enteritis. Inguinal Hernia occurs in wholly males, and if in geldings then the inguinal canal is not obliterated. In the stallion this canal is kept large by the working of the spermatozoon cord. All Hernia can be seen by the outside enlargement, except the Diaphragmatic. The symptoms attending Strangulation of the Bowel are much the same as seen in Spasmodic Colic, but is very rapid in Hernia of the Inguinal Hernia; the pain is terribly severe

and may come on in an hour; the others come on more slowly. If it leads to Strangulation quickly, then gangrene may take place. When called upon to treat stallions for Colic, *suspect* Hernia—always. In autopsy, find protruded portion black.

Treatment.—For Hernia, depends upon the location of it. *Umbilical*, you are usually called upon to treat this in little animals, from a day up to several months old. It is very common among puppies, especially the Pug. In some cases the omentum alone protrudes, in fact, in a majority of cases. Depending upon the size of the animal, we adopt—first thing, to close the opening, of course first reducing the Hernia; if it is easy to put back, then it is the bowel, but if difficult, then it is the omentum. Always lay the animal on its back to close the opening; one way being to close with clamps on the skin, another is to ligate; another is to open the skin and sew up the rupture. Always be sure there is none of the bowel left out, gather as much of the skin as was in the swelling, then ligate all this skin, or put several skewers through, and ligate below them. This is followed by the inflammation that will be set up and which causes an exudate, tumefaction, adhesion, and consequent organization of the exudate and healing of the parts. Remember all these surgical operations are to be performed antiseptically, If in twenty-four hours, with the clamps, the parts begin to swell; in forty-eight very large, and in sixty hours it may be enormous. Don't be frightened, that is what you want; in a week or ten days this skin will die and drop off; if not, in twelve days you can cut it off. Always tie moderately tight—never so much as to cause death by Strangulation.

VENTRAL HERNIA.—Treatment of this depends upon the size of it; if three inches in diameter, there is no use to treat it, but if two inches, it is easy to handle; this is usually found high up on horses, due to kicks, but low down on cattle, due to horning. If less than two inches, or even two inches, treat as in the Umbilical, only it causes a pucker in the healing; but you can draw the edges together and keep on restricted food diet for about ten days, when it will heal. If it is necessary, clip off the hair, but you can clean the hair nicely and use it as gauze to sprinkle in the iodoform. Another way to close this is by the use of the hypodermic needle, injecting with some irritating substance, as solution of common salt, filtered; inject about one dram about an inch apart, in several or more circles around the opening, say over a space of four inches. Or instead of this, in a fresh case, put on a strong blister; a truss would be good, but impossible to keep it on. I would prefer the injections of salt for a valuable horse, as it will not pucker; or you can open the skin perpendicularly over the opening and use fine silk or catgut to sew up the rupture; when the sutures rot out, there may be an exudate of lymph from the external opening, and the sutures are often absorbed or come out in little pimples. Sew up the external opening with number twelve silk, and take good strong hold on the skin; treat antiseptically and bandage.

INGUINAL SCROTAL HERNIA IN STALLIONS.—This is difficult to handle. Lay him down, something like for castration; if it has not been in existence very long it is easy to put back; if down into the scrotum, I find we get the best results by inserting the hand in the rectum, first giving him 2 ozs. of chloroform or 1 and $\frac{1}{2}$ ozs. of chloral, then in about fifteen minutes he will be quiet and you can go to work; it may be well

then to produce entire anæsthesia, as it will help you by causing a complete relaxation of the parts. With the hand in the rectum you can easily find the abdominal ring, then with the help of the hand on the outside you can force back the bowel; be very gentle with the hand that is in the rectum. It may be necessary to open up the skin; use a probe-pointed bistoury to enlarge the ring, this only when all other ways are useless, but the Hernia must be reduced. After operating for this, put the horse in a narrow, single stall, and have the hind parts elevated until it heals. Give dry brand and very little hay. It is sometimes necessary for him to lose a testicle in this case; warn owner that it may not be successful.

STRICTURE IN THE INTESTINES.—Occurs much the same as any stricture in any other part; some local irritation exists and is continued for an indefinite length of time, setting up chronic inflammation; the result of this being proliferation and cicatrization. Stricture occurs by a thickening of the intestinal walls, and by constriction reducing the calibre of the intestines. We find that the walls instead of being large and dilatable are very thick and inelastic; sometimes this occurs on the outside of the bowel, but usually in the body of the wall. Sometimes following stricture we have a degeneration of the Neoplastic tissues, and as a rule it organizes and becomes white fibrous tissue and remains with the animal, interferes with free passage of the fæces, and leads to Enteritis and death; this could not probably be diagnosed during life, but it would do no good if we could. In the human they have cut out this constriction; the operation is called Enterectomy, or as now they call all operations on the belly—Laparotomy.

Alteration of Position of the Bowels.—Under this head comes Twist, Gut Tie or Enlargement. This usually occurs consequent to and dependent upon rupture of the mesentery, spoken of by some authors as Mesenteric Hernia. In this we find a rupture of the mesentery, and the bowel passing through this rupture gets the twist, etc., and interferes with the passage of the fæces. This must have occurred while rolling, etc., but it is a conundrum how. I think there must have been some degeneration of tissues before this could occur—these twists, etc. They generally occur in the small intestines, but can in the large ones by the bowel falling across the other. It is almost impossible to diagnose during life.

INTUSSUSCEPTION—VOLVULIES—INVAGINATION.—Or the passage of a portion of an intestine into another portion of the same one. This is a comparatively common accident and can occur only as the result of some textural change in the bowel—one portion of the bowel being unhealthy, and the healthy part anterior to it, slips into it.

Etiology.—Some violently increased peristaltic, generally after some severe purgative has been given. The most common is the ileum into the ileo cæcal valve, or into itself.

Semeiology.—Symptoms are the same as Colic and Enteritis; they are much the same in all the cases—there is nausea, profuse perspiration, violent and increasing pains similar to Colic. By inserting the hand into the rectum you can often tell the trouble, where the colon falls over itself; but where the ileum passes into itself, I don't think you could feel it. In the latter stages of this trouble there will be considerable Flatu-

lency and persistent pain present. The animal usually dies stupid, and the horse also becomes apparently blind.

Treatment.—Of this, must depend upon the circumstances. We can't practice Enterectomy, because the animal must lie on its back after the operation, in order to insure success; this is why it can be practiced in the human. Eserine used subcutaneously may overcome alterations in position. Anodynes, diffusive stimulants, fomentations, oleaginous laxatives, are indicated. There is a peculiar phenomenon in cattle—where a portion of the ileum passes into the colon and then becomes stopped, and Strangulation and sloughing take place of the part that is passed the ileo cæcal valve, the remaining healthy portion adhered to the valve and the sloughed part has passed out, making a good recovery. Cattle have been known to pass six feet of intestines this way and recover; in human, from one or three inches to a foot, and make a nice recovery. After the sloughing off, there is an exudate that causes the joining or adhesion. In all these cases, where it is a valuable horse, it is well to make an autopsy when they die, to prove to the owner that you were right.

PROLAPSUS OF THE RECTUM.—Spoken of as *Eburses*. This is a protrusion of the rectum out through the anus; it may be only an inch or two, as in the horse, or may be a foot or fifteen inches in pigs or dogs; in cattle, accompanying calving, from two to four feet is not uncommon. It may occur in any of the animals, and as a rule is due to either Constipation, Diarrhœa, or straining accompanying parturition. In horses, cattle and pigs, mostly due to Constipation; in dogs, to Diarrhœa; cattle also in Parturition. If it is not excessive there is no danger, but if excessive and left out an hour or so, then comes Strangulation at the anus; the cause of this is the contraction of the sphincter ani upon the protruding bowel—this is followed by gangrene and sloughing off of the part. One of the most common causes of this trouble in the horse, is soap injected by stablemen and some left in, during Colic; also in young animals when the pasture is dry and they cannot get water.

Treatment.—Wash the protruded part with some antiseptic and soothing lotion, as olive oil with a little carbolic acid, and add to this a little opium; with this always give a good anodyne, then carefully and gently replace the protruding bowel. After the bowel has been replaced, nature feels the swelling and acts as if it was faecal matter, and there is spasmodic straining; so to prevent this give anæsthetics, as chloral hydrate, and repeat; this to be given in the mouth. The straining makes it difficult to keep the bowel back, so along with the above give rectal injections of opium; after the gut is replaced, oil your hand and insert and remove all the fæces that you can; good to use a little soap and water, but not enough so stimulate the bowels; then after a while it would be well to give a laxative. Remember that it is an easy matter to run your finger through the gut while in this state, so in placing the gut back, use an ointment of tannic acid and opium a a, rubbed up with vaseline or lard, and use your palms. Next day give a stimulant, as sulphur and lard; sulphur 2 dr., lard 1 oz.; apply this. Give the animal plenty of water and soft feed; never give aloes, instead, give oleaginous laxatives; melted lard is good for laxative of bovine. When it comes from Diarrhœa, as in the puppy, give anti-acids and anodynes; in the dog, after

replacing, injection of starch is good; then afterward sew up the opening of the anus and leave in two or three days. In case the protruded bowel becomes gangrened and sloughs off, you can interfere with a little surgery. Insert your finger into the gut and cut the outside skin about an inch from the anus and above the gangrene, then draw out the inner part and cut off the remaining part. Sew these two parts together, then carefully push back into the anus; that is sewing the healthy part of the bowel to the sphincter ani. Make the sutures about half inch apart, or leave the part on after sewing and it will slough off at that place; this will work good in dogs.

PILES—HEMORRHOIDS.—These are bleeding piles; they are little congested parts of the mucous membrane lining the rectum; they may be in a foot or fifteen inches. They are very troublesome in the human, and the same cause produces them that produces prolapsus—as Constipation, etc. The hard fecal matter irritates the mucous membrane and causes a little local inflammation that finally becomes chronic.

Symptoms.—When the horse goes to dung, will switch his tail from side to side, or up and down between his legs; as the feces comes out he shows the itching by rubbing his tail against something, and there is a general uneasiness; the dog will sit down on his anus and slide around that way.

Treatment.—Laxative food, a great deal of water, few handfuls of bran along with his oats—this to stimulate the secretions. We find an ointment of sulphur and lard, 1 to 8 or 1 to 4, introduced liberally is beneficial, also very good in human,—beats nut galls. For the human, the best thing to do is to relax the bowels with apples, night and morning, or some such fruit and plenty of water and exercise. In case these piles are old and won't give way to treatment, then excise them; dilate the anus with a speculum and remove with an ecraseur, cauterizing them afterwards with electric needle heated white hot; this is the way it is performed in the human.

IMPERFORATED ANUS.—This is found in little animals after birth; there is no opening; it is seen more in little pigs than in other animals, but it occurs in babies, foals, and calves. This must be attended to in not more than two days, or you can do no good. Cut in with scalpel, if necessary insert a plug of oakum to keep the place open. Where the rectum terminates in a blind pouch, but the opening of the anus is all right, insert your finger and draw back the rectum to the ring of the anus, then cut an opening and stitch the edges to the anus. You can easily find the rectum, as it will be filled with the feces. These are common occurrences.

RUPTURE OF INTESTINAL WALLS.—This occurs the same as rupture of the stomach, and is always the result of some other intestinal disturbance—a most common cause is the reckless violence used in evacuation; this occurs in the rectum, when from other causes it will be in the colon. It is always fatal, and the animal will die from collapse or syncope. Sometimes the food passes out of the rupture into the abdominal cavity, then the animal dies from Peritonitis, which is set up; this is rare.

Semeiology.—There is no absolute diagnosis, the symptoms being much the same as the others. You will notice after a violent pain and other symptoms, that the animal gets quiet; to an ordinary observer

it might be thought that this was an evidence of relief, but you can see the dejected, haggard countenance, begins to sweat, gets weak, lies down, gets up and sits on his haunches, makes effort to vomit; respiration becomes weaker, frequently the expired air is cold; there is violent straining without any apparent cause, the pulse grows rapid rapidly, and smaller and harder; as death approaches, will lie down, get up, brace the legs and finally drop. In case the rupture is small and the faecal matter passed out into the abdominal cavity, the animal will die in from two to three days from Peritonitis, but usually in from one to six hours from syncope. The only positive proof as to the cause of death in these cases that we have, is in autopsy. If the owner wants it done, with a law suit in view, charge him \$25.00, but if for his own satisfaction, then \$5.00. In human practice there are various operations performed for these troubles, that are impracticable in veterinary. In cattle, more liberty can be taken in operating on the belly than in the horse, the horse being so vascular and having such a great nerve supply.

ENTERITIS.—Is inflammation of the bowels, and is the most serious inflammatory trouble the horse is subject to. It most often affects the large intestines in the horse; when the small bowels are affected you may come to the conclusion that it is due every time to poisoning; when due to any other cause, you will find it in the large bowels. It starts usually in a circumscribed tract, but this would depend upon the cause. When Enteritis follows impaction of the colon it is large; if from Intussusceptions or Calculi, it would be circumscribed, but would spread rapidly. In the pathogenesis there is considerable difference of opinion; some say it starts in the muscular coat, and some say in the mucous; the probability is, that it starts in the mucous and involves the rest. It comes on very suddenly, runs a rapid course, and invariably terminates fatally. It runs its course in from six to eight hours; in some cases it may run on twenty or more, but we frequently see the horse dead after the first six hours.

Prof. Williams is inclined to look upon Enteritis as Apoplexy of the Bowel, and there are some symptoms the same. Apoplexy applies to congestion and hemorrhage, that is why we get such strong symptoms alike. Symptoms in common,—we find the bowels more or less filled with blood, indicating hemorrhage; it is possible that there are ruptures of small blood vessels, but there is always inflammation present, so if it starts in Apoplexy it terminates in Enteritis in such a case. Suppose the cause is congestion—we have violent active congestion, and possibly rupture of some of the capillaries; this occurs in the mucous coat and extends to and involves the muscular and parts of the serous; the Hernia is so severe we get considerable congestion, but not enough to cause gangrene; but inflammation runs its course and results in gangrene, and as said, the horse is a great deal more liable to it than any other animal—many times more so than the ox, dog, or human, and with the other causes, the stomach of the horse is so small and the intestines large. Cattle and pigs frequently recover; horses—very seldom, may say never.

Etiology.—Causes are very obscure, the disease coming on when the animal appears in the best of health, so can only say it must be due to or from indigestible matter in the food. It might be that the horse coming in during dirty, muddy weather has had the hose turned on his belly, the

water ice cold—followed by Enteritis in a few hours. We also find that if horses are kept too long on the same kind of food; or putting the horse to hard work too soon after eating may cause Colic, followed by Enteritis; or there may be mechanical injuries or parasites—as the *Strongylus Tetracanthus*; so all causes that produce Colic, we may say, produce also Enteritis. Why?—Can't tell.

Semeiology.—First, while congestion is taking place, there is considerable dullness; the horse hangs his head, refuses his food, and there is nervous depression that operates on the mind, we believe, as in the human; pain comes on gradually, in the course of a few hours comes on rapidly; begins to kick and paw, walks around, turns nose to flank, switches the tail; pain is continuous and grows worse; quick pulse, increases in frequency, is quick and irritable, becomes hard; temperature may be from 103 to 105 in the course of an hour; as the pain increases, the breathing increases and keeps it up; the ears and extremities get cold; friction on the stomach causes pain; lies down gently; the continuous character of the pain is invariable when he passes fæces; the visible mucous lining is very red; the pulse as it runs on may get up to 60 or 80; there is a terribly haggard expression of the countenance. Towards the end of the disease the mind is affected and the animal becomes stupid, blind, deaf, and walks around with his nose to the floor, becomes delirious, crazy as a loon; sometimes stops, takes long sighs; the surface of the body becomes bathed with sweat, mouth gets cold, visible mucous membranes are livid, and towards the last half hour, have a bluish pallor. Just before death the pain may cease and the horse remain quiet till death, which soon comes. When this has occurred we conclude gangrene has taken place; if you take his pulse it is slow.

Post-Mortem.—On opening, the outer coat will be red in patches; you can usually determine the bowel by the color, may be the colon, and from four to six feet of it. Sometimes it may also involve the cecum; the mesentery is also injected; the omentum often is quite black. You will find the red bowel much thickened, and mucous coat black as tar; bowel is partly filled with bloody fluid; on the surface of the mucous membrane there is usually a coagulation, a jelly-like accumulation—this is proof that inflammation existed. Cows often get Enteritis from licking the paint off newly-painted pipes, etc., or they get the poison from the yew tree or poison ivy.

Treatment.—This is very difficult to treat in the horse, for we think it incurable. But give rational treatment as the case calls for; purgatives or laxatives are contra indicated; opium is indicated in large doses to stop the peristaltic, and if you can keep it so for three or four days, may effect a cure. This gives inflammation time to subside. Belladonna is also indicated; give $\frac{1}{2}$ oz. powdered opium the first dose, and 1 dr. in each dose after; give mucilaginous drinks for several days. When he is picking up, in case of recovery, give 1 pint of linseed oil; establish the peristaltic very gradually; the first passage may be in ten or fifteen days. Make applications of hot water and blanket and mustard. If the opium does not suffice, give hypodermic injections 5 to 10 grs.; morphine and aconite may be given from the start—fl. ext. 5 to 7 drops. Give a little acetate potash to keep the kidneys in good condition. In case of recovery, give stimulants, alcohol, ale, etc. Wherever there is much tendency to con-

gestion, bleeding might be good; also gentian and camphor are very good in all bowel troubles.

PERITONITIS.—Inflammation of the peritoneum; the serous membrane of the mesentery occasionally becomes involved in the inflammation, much the same as in Pleurisy. Associated with Peritonitis in the third stage is dropsy of the abdominal cavity; this is called Ascites; this disease exists in both the acute and chronic forms. In Peritonitis there are pains as in Enteritis, but not so severe. Ascites resembles Hydrothorax.

Etiology.—Wounds of some kind, particularly those that puncture the bowels, or by septic poisoning, as this part of the body is more liable to development of germs than any other part. If there is a wound in the abdominal cavity, the introduction of a single germ may result fatally; so we find that wounds in the abdominal cavity are almost always fatal, especially in the horse. Simple castration is often a cause, and often it follows tapping for Flatulency, though in my case, all that died from tapping, died from Enteritis or some other cause than Peritonitis. The Strongylus Armatus is the worst germ we have in this case; there is an infectious form associated with Parturition and with Metritis, which frequently follows Parturition. This form is called Metra-Peritonitis, and is very common in the human and lower animals. My opinion is, that there is often too much interference with the vagina when uncalled for, in woman, which causes this disease by the introduction of some germ. Gastric and intestinal ruptures, with passage of food into the abdominal cavity, cause it. Then we find the chronic form caused from starvation, especially in old animals turned out to grass, or from chronic liver troubles; in dogs, from kicks in the belly, or from lying out at night—lies on his belly on the ice or snow; also in the horse, from heart and liver troubles: these often cause the Ascites, but before you can have the acute, you must have some disorganized condition of the peritoneum.

Semeiology.—The horse manifests abdominal pains, not so severe as in Enteritis—it resembles the Colic more. The pain is more subacute, the horse will lie down quietly, gently, not roll or sweat, but will try to get on his back if he can, and against the partition; will often lie thus for half an hour at a time. There is pain on pressure of the belly, appetite not affected at first, but as the disease runs on the appetite is lost; pulse is increased in frequency, is rapid, small and hard, is irritable, quick. In the course of from two to ten days, according to the rapidity, Ascites develops. As the Ascites develops the pain diminishes; he is easier, but we can see he is getting weaker; the pulse becomes wiry, very wiry, and he dies from collapse, syncope, heart failure; this is why he may live longer than in Pleurisy. Ascites is recognized by the distension of the abdomen, due to the amount of water secreted—this is sometimes enormous. In slowly developing Ascites, as in the case of Strongylus Armatus, it may run on for a month with very little suffering. You can diagnose by having an assistant percuss on the opposite side of the abdomen; you can hear the sound much plainer, and if he punches the abdomen on his side you can see the other side fluctuate, or you can test with the trocar. The horse usually falls off in flesh while Ascites is developing when caused by the Strongylus Armatus, but when from any

other cause, there is a general running down of the condition, starry coat, visible mucous membrane anæmic, eyes sunken, etc.

Prognosis.—If the inflammation is circumscribed and of the mild form, may be favorable, and vice versa if diffused and severe.

Post-Mortem.—You will find the bowels full of amber-colored fluid (serous), resembles the water found in the chest; of course the amount of color depends upon the amount of hemorrhage; if the Ascites developed very fast, will be red; but if as usual, slowly, then it will be serous colored. You will find a certain amount of coagulation of this water; the omentum is apt to be filled with coagulated serum. In all cases the peritoneum will be thickened and softened.

Treatment.—On general principles, treat the same as Enteritis; perfect quiet, soft food, no purgatives or laxatives; give opium and diffusive-stimulants, as nit. ether, linseed tea, oatmeal gruel, etc. If the heart is weak and will not respond to these, give digitalis; also give vegetable bitters, as gentian, cinchona, also mineral tonics, iron, camphor; camphor is good alone or with any of the others. Acetate potash or nit. ether keeps the kidneys in shape; nux vomica and iodide potash with iron during convalescence. When the amount of fluid in the belly is large, draw off; this operation is called Paracentesis Abdomenis, and often only palliates the trouble, and it may refill. Tap through the median line posterior to the umbilical; always use a good-sized trocar. Sometimes the omentum or the Strongylus Armatus will bother you by closing the opening of the instrument, so you must use your ingenuity to work it around. These worms are often found here three sixteenths of an inch in diameter and three inches long. In case of Ascites we often get good results from pumping in an aqua solution of iodine; this is good in small animals also; 1 to 2 drams to the pint of tepid water—have the water the same temperature as the body.

DYSENTERY.—Sometimes called Bloody Flux; this is an inflammatory disease and affects the large intestines, particularly the rectum. The fever with it is of a low order or form, spoken of as Typhoid, is accompanied with a fluid discharge from the bowels, characterized by large quantities of mucous streaked with blood, and Tenesmus (spasmodic contraction) of the Rectum, and straining—violent fits of straining. This is closely allied to Diarrhœa; it may run into Diarrhœa, but differs from it in that there is fever and local inflammatory action, attended by serious tissue changes; or rather specific changes.

Etiology.—In some there is a predisposition to it; Prof. McEchran says that cattle of a light red, blue or black color, knees close, narrow chest, tucked-in flanks, etc., are predisposed. Dr. Baker thinks the color depends upon the health, not the health upon color; may be caused by unfit grass from low-lands or from hard work and poor food. The horse seldom has it. Cattle are generally weakened by some other disease before, such as contagious Pleuro-Pneumonia, Malarial Fever, Typhoid, Tuberculosis, etc. Dysentery often ends the case of any of these diseases. Another way they may get it is from the germs on the grass in low ground that was overflowed. Hemorrhage is a prominent feature of Dysentery.

Semeiology.—It starts out in most cases as a case of Diarrhœa, but that is in the early stage before the bleeding or bloody appearance of the

fæces; soon after the starting of the Diarrhœa there is a fever with rigors and great prostration; the pulse is quick and irritable, more or less rapid; the coat is dry, hard and starry; loss of appetite, great thirst, frequent painful evacuation, increasing in violence; Tenesmus of the rectum, proven by the actions of the animal—the cow will stand with all her feet in a bunch, back arched and straining, spasmodic cramps of the rectum, discharges a fluid fæcal matter. In the early stage this matter is mostly mucous, slightly red, and may have some jelly-like matter and thread-like tissue through it; this is very offensive, it comes from the gangrene of little circumscribed parts, supposedly of the follicles. There is some hemorrhage, and the Tenesmus has a tendency to rupture the capillaries, hence the streaks of blood in the discharge—sometimes it is very bloody. The disease has as great a tendency to be fatal as any disease we might have, and is common both to man and the lower animals. It is usually the evidence of the breaking down of the whole system from some other disease. After it has been running on for some time, there is much evacuation of water; there is a tremendous thirst; we find that some of the discharge is gluey. After it has run on three or four days, there is Marasmus and the animal dies from collapse.

Post-Mortem.—There is a swollen hyperæmic membrane of the bowels; the glands of the mucous membrane may be ulcerated as well as some of the surrounding tissues. In cattle we usually find Tuberculosis in different parts of the body, often quite general; we find it in the liver, mesentery, udder, etc. In little animals where it follows Diarrhœa, we see extreme pallor.

Treatment.—Good nursing is the best of all; warm clothing and warm bandages to the legs; give bland fluid drinks, small doses of oil; give diuretics in small doses, quinine and vegetable bitters; opium to arrest the cramps, especially opium and starch gruel injected; give mineral astringents, sulph. iron and copper, acetate lead, nitrate silver—these act as tonics to the blood, and are all antiseptic. Ipecac and opium mixed are good.

Prognosis.—This is almost always unfavorable; there may be recovery, but as we see it in the lower animals as being the ending or breaking down of some other disease, there is little room to be favorable.

DISEASES THAT CATTLE ALONE ARE SUBJECT TO.

IMPACTION OF THE RUMEN.—This is almost always followed by Rumenotomy. This impaction occurs when an animal gets at oats and fills up, or sometimes this trouble happens on the first grass as it is just shooting up, and the animal eats so much dry, indigestible chaff getting at the grass; but usually it is the grain, and the only way to get rid of Impaction of the Rumen is to cut into and dip it out. You can recognize this impaction by the peculiar swelling, and you can feel it solid and dents on pressure; the animal gets stupid, and in a bad case, as said, you must operate to relieve it. In a mild case, drench the animal with hypsulphate soda and give stimulants—as aromatic spts. of ammonia, etc. If you have to operate, secure the animal with ropes, then cut in on the left side, make a perpendicular opening about six inches long, about the center of the last rib and downward. Clip off the hair first, cut through the skin and tissues till you reach the rumen, then cut into this, but make

the opening a few inches less than the other one; draw out the lips of the wound in the rumen, and after placing a napkin to prevent the matter dropping into the abdominal cavity, empty the rumen of all but about a gallon, pour in large quantities of water, a bucketful with a pound of Epsom salts, then sew up the rumen with the knots on the inside, spraying occasionally while operating, with antiseptic; then sew up the other opening with strong silk or wire. These operations are almost always favorable. If they get into a clover field they will eat so much that they will soon begin to bloat; Tympanites will take place, then you will have to tap with the trocar and cannula, and you must hurry more than in Impaction of the Rumen, because of the pressure on the diaphragm, and the danger of Asphyxia. Another peculiarity of cattle is to eat everything in sight—as bones, wood, linen clothing; sometimes swallow large objects like rake teeth, iron bolts, etc.; these may pass out through the rumen and be removed from the side of the animal. The second stomach seems to never have any such troubles, but the third stomach, called the omasum, has. Impaction in this has been given some provincial names, as Fardle bound, Impaction of the Manifolds, etc. Impaction of the omasum is very common, and other names given it are, Dry Murrain and Bake of Manyplies. Then we have also inflammation of the fourth stomach, called Abdomasitis, and it is invariably present in impaction of the omasum and often involves from four to six feet of the ileum; there is always a certain amount of Enteritis in those parts.

Etiology.—Sudden and radical changes in feeding, severe errors in dieting. In Canada, where they used to grind the corn, cob and all, we often saw this trouble of the omasum. It is hard to tell just what is the cause, but we think that the leaves of the omasum become partly paralyzed as a result of overwork; the duodenum is usually involved.

Semeiology.—Bowels are often noticeably loose preceding the trouble for several days, then followed by Constipation that lasts as long as the disease, and the animal may die in five or six days. There is a loss of appetite and rumination is suspended; more or less fever, may be from 103 to 107—in bovines it doesn't usually run high; respiration is increased, and with the respiration there is a grunt; in this case you can usually feel the omasum at the right flank low down. Pressure to the belly will cause pain; sometimes the brain is affected and the animal becomes stupid.

Treatment.—The contents of the stomach must be softened, so large quantities of bland fluid is rational treatment, as linseed tea, and with it oleaginous laxatives—as a quart of melted lard; it acts better than any other oil; or give from one to two qts. of linseed tea with a little calomel; nux vomica and gentian are good; quinine may also be added to this; bicarbonate soda is highly recommended. Prof. Strangeway says salts are no good; dose with oil and with a sedative, 8 to 12 ozs. sulph. magnesia, and combined with the remedies 15 gr. doses of quinine, with a few drops of sulph. acid; then give soft food.

Prognosis.—Unfavorable.

SURGERY.

The first account we have of surgery as practiced on the lower animals, was 3500 years before Christ.

Chirurgia.—From the Greek—means Surgery.

Chirurgical.—Is much used, means treatment of disease, manually; it is also taken from the Greek.

Surgery as a science inquires into the nature, existence and seat of disease; as an art, relates to the removal and suppressing, constituting a cure.

Anatomical Surgery relates to that part where the operation is to be performed.

In order to be a successful surgeon, it is necessary to have a thorough knowledge of the animals we are going to handle, and to know their weak points, so we confine them that they may neither injure us nor themselves.

Operations are spoken of as being Simple or Complex, Bloodless or Sanguinary. There is always more or less danger attending operations, from shock or unexpected hemorrhage, etc., and it is always well to inform the owner against all possible dangers before operating.

For the best methods of restraining the animal while operating, I refer you to Fleming's Operative Surgery.

The time of day as regards light, and the time of year as regards the temperature, etc., cut some figure in all operations.

A horse should be perfectly quiet before operation; if he has been laid up, give exercise a day before the operation.

Always have instruments to suit the animal and the operation you are to perform. Have your instruments, sponges, antiseptics, anæsthetics, etc., always ready before beginning.

Minor Surgery is a term sometimes used instead of Simple Surgery.

Plastic Surgery applies to surgery on the soft tissues.

A Wound is a solution of continuity.

Incised Wound is one made with a sharp instrument—a cut.

A Punctured Wound is one made with a pointed instrument. (Stab.)

A Lacerated Wound is one that is torn.

A Contused Wound is one that is bruised.

A Gunshot Wound is one made with a bullet or shot.

A Poisonous Wound is one produced by poison.

The principal feature is what becomes of a wound; of course there is likely to be a hemorrhage; next is danger from septic poisoning by septic germs getting into the wound; these often run on to produce violent inflammation, gangrene and death. If septic poisoning does not occur, nature begins at once to heal the wound.

Healing a wound is an inflammatory process—inflammation and proliferation. We say wounds heal by first or second intention; first is by an intention; second by any other cause—it heals by granulation. The only difference between the first and the second is in the amount, as in the first it is imperceptible to the naked eye, in the second it is very well marked and very perceptible. In the first the surfaces come together, in contact with each other, and seem to stick together without granulation and suppuration, while in the second there is a gaping wound that fills up by granulation and proliferation and the forming of new tissues; this is called Hyperplasia; or rather there is a condition of Hyperplasia when inflammation and proliferation take place; this newly formed tissue is nowadays called Neoplastic tissue; old times it was called scar tissue, etc.

HYPERTROPHY.—Means simple enlargement without forming any new tissue. In healing of wounds there is always Hyperplasia; in the second kind of healing there is often suppuration; in the first intention there is none. The suppuration from a wound is the union of leucocyte of the blood on the surface with the exudate of lymph from granular surface, and the pieces of broken down cells; this forms the pus that is seen upon the surface of wounds. This excess is an effort of nature to prevent the introduction of the septic germ, they being caught like a fly in molasses and carried away with the flow.

In this process by second intention of healing, after 24 hours the bottom of the wound will be seen to be intensely red and somewhat swollen, with some thread-like loose tissue among the normal ones; these are the cells that have died, and all cells that are cut or injured, when the wound occurred, die and break loose. The second day after, there is a gelatinous appearance over the wound, a grayish red fluid; this is the lymph; after this little red nodules, or granulations, will be seen on the surface until finally the whole surface is covered with them, a mass of little red piles; after two or three days these begin to proliferate. This surface is called the granulating surface. While this is going on the surface is covered with a gelatinous creamy discharge. As the wound fills up by granulation, nature fills the cavity; all this new tissue is called granulating tissue, and is always white fibrous tissue and not of the same nature of the part that the wound occurred in; the bone is partly an exception, for after a time the tissue in the bone becomes ossified, although not having all the nature of true bone; this explains the white scar left after a wound has healed; this white scar is called a cicatrix.

Antiseptic Surgery.—Often a wound has become poisoned by the septic germ before a surgeon sees it, so he is called on to treat it antiseptically, that is against the septic poison. Proud Flesh, spoken of as exuberant granulation, is usually poisoning of wound, composed of large weak cells, soft to feel, frequently break down from suppuration; also bleeds easily.

Sternberg's table of antiseptics in use is as follows:

								DESTROYS	PREVENTS
Corrosive Sublimate	or	Corrosive Chloride	Mercury	-	-	-	-	0.005	0.003
Iodine	-	-	-	-	-	-	-	0.02	0.025
Carbolic Acid	-	-	-	-	-	-	-	0.03	0.02
Salicylic Acid	-	-	-	-	-	-	-	4.	0.05
Boracic Acid	-	-	-	-	-	-	-	4.	0.05
Alcohol	-	-	-	-	-	-	-	20.	20.

Dr. Billings says tannic acid is the best of all, usually used in equal parts with sugar of milk, rubbed together. Iodoform is an elegant antiseptic, as iodoform, starch powder, boracic acid powdered, of each equal parts. This is now used in human practice. Dip gauze into it, also sprinkle well with it, and place the gauze over the wound; this is now called dry dressing. The iodoform alone is too irritating, and boracic acid is very non-irritating. Now suppose we have a simple wound—clip off the hair, wash well with warm water and soap, then sponge over with clear alcohol or a weak solution of bichloride mercury, strength of .002 to .003, or 3 per cent carbolic acid, or 4 per cent sol. boracic acid. If the wound is large it must be sewed up. We have different kind of sutures: First, we have interrupted sutures, in which

each stitch passes through the wound, and is tied separately. The uninterrupted suture is where the sutures pass in and out the whole length of the wound. The pin suture is for small wounds; you insert a pin through the wound, and cross the silk over and back in a figure 8 style. In the twisted suture there are a number of pins, and the silk is twisted in and out all along the wound to all the pins. The looped suture is where there is no care about a pucker; in this the suture is passed in and out a number of times, then all tied in a bunch. Dossell is where the ends are all separate and fastened on each side by some object, as oakum. Quilled suture is where a quill or stick is placed on each side, and the suture passed in and out of the wound, passing around the stick or quill each time. Then there is the Crucial, the T, the Zigzag, and the X suture.

The material used in sutures is usually *silk*, though silver wire and catgut also, according to the requirement. New one, kangaroo tendon.

Needles are Straight, Curved, Medium Curved, Full Curved, Double Curved or S-shaped.

Incisions are various in practice; they are either simple or composite. Simple is a simple straight cut. Composite ones are the T-shaped, V-shaped, Crucial, Crescentic, Elliptical, Circular, Rectangular and X-shaped.

All incisions or punctures are made with a scalpel or with a curved or probe-pointed bistoury.

In opening deep abscesses, we usually use a scalpel; where it is not deep, we use a curved bistoury; the trocar and cannula is sometimes used; also sometimes an exploring needle, but this is seldom used now, humane physicians are discouraging its use. In all delicate operations, hold your knife as you would a pen.

The next thing after incisions is hemorrhage—bleeding.

Hemostatic is the powder or anything used to stop the bleeding, and Hemostasia is the stopping of the bleeding.

Hemostasia is of two kinds—Preventing and Arresting. Prevention first by external pressure; this may be applied by ligature placed around the limb above the point of operation.

Tournique.—A binder put around the limb and twisted. If operation, while bandage is on, should last more than ten minutes, take it off and then re-apply; or by Esmarch's bandage, by winding a bandage from the toe or finger up the limb to a distance above the point of operation, when the part below is taken off, then the blood is nearly all driven out of the limb, making a nearly bloodless operation. Then, instead of pressure, we sometimes freeze the parts—that contracts the tissues and lessens the calibre of the blood vessels; this may be done by ethereal spraying, or with carbolic acid; then the seton and actual cautery are used in stopping hemorrhage.

Next is to arrest. This is done by three means—physical, chemical and surgical. The physical are first, refrigerants; they produce cold—ice is one, the principal one. By stimulants, the principal one is hot water; this is a very admirable remedy when the hemorrhage is profuse from the capillaries; use with a sponge, say with water at 160 to 170 Fahr. Next is creosote, oil turpentine and alcohol. The next are the absorbents. These are anything that will take up the blood and hold it;

they induce coagulation, as oakum, tow, lint, white flour, sponges, punk, cobwebs, fuzzy side of sole leather, etc. In deep wounds these absorbents can be pushed down into the wound—this is called plugging; in this you have both physical and surgical. Charpie is a finely prepared lint or tow. Chemical means are those we get to produce coagulation, chemically. It includes first, all the astringents, all the caustics, and actual cautery; these astringents and caustics are often spoken of as styptics—they coagulate the albuminoid in the blood and the tissues as well as the blood, by forming a clot by the coagulation of the albuminoid; for this reason the chemical means are very objectionable, and are only resorted to when other means fail. It is impossible to get healing by first intention after the use of caustics, as they destroy the tissues in the immediate vicinity; so we prefer astringents instead, as alum, etc. Caustics are the different preparations of iron, nit. silver, caustic potash, etc. They are often applied by soaking tow or oakum in them, and placing them on the wound. Vinegar is often used with a sponge to stop hemorrhage. Next comes actual cautery with a heated iron; it cooks the flesh and contracts the openings; necessarily the tissue is destroyed.

Surgical means are five in number—1st, compression; 2d, ligature; 3d, torsion; 4th, acupressure; 5th, uncipressure. Compressure means pressure in two ways—provisional and permanent. Provisional means impromptu, or on the spur of the moment, as with the thumb or finger when first cut; permanent, that which is left on for some time; compression is applied directly to the wound, as tow or lint, and held in place by a bandage. Lateral pressure is applied to the side of an artery, and may be three, four or more inches from the point of injury; if an artery, it is applied above the cut; if a vein, then applied below the cut or wound. You can tell when it is an artery and when a vein, by the color—arterial blood being bright scarlet, and venous dark red; also by the way they bleed—the artery spurts in jets, while the vein flows in a steady stream.

Ligature.—This is tying of the vessel; this is done immediately, when applied directly to the end of the vessel, and mediately when tied some distance from the wound in the continuity of the vessel. This is the best means. Where you have large vessels to attend to, do it with silk.

Torsion.—This means twisting the vessel; it is necessary to have two forceps to perform it right.

Acupressure.—Means pressure with a needle or sharp piece of steel; the pressure is applied by passing the needle through the tissues on each side of the vessel, either above or under the blood vessel.

Uncipressure.—Is to draw out and hold or twist the artery in a bent or crooked position. We also plug with oakum, in joint, dipped in antiseptic.

Actual Cautery.—This is firing, spoken of as potential cautery, used to produce an excessive amount of inflammation, local, with a view of increasing the local physiological action, and sometimes with the idea of counter-irritation; we get the benefit by the increased blood circulation to the part, and hence increased nutrition. There are two ways—by feather or by pointed firing; one is done with the feathering iron, the other with the budding iron or point. In firing we see three colors—lemon color, which is the one we want to see in light firing; orange we want in heavy firing, and brown when we want very heavy firing—as in a bad case of

Spavin. If you are going to fire heavy, draw the lines farther apart than when you intend to fire light. Never make your lines in light firing closer than one half inch apart, and with a light iron. For the orange color, make about three fourths of an inch apart; for the brown, make about seven eighths or one inch apart, and after firing you may put on a mild blister.

OPEN JOINT.—That is when the skin, binding ligament, capsular ligament and synovial membrane are ruptured, and there is communication with the outer surface, with the escape of synovia. Any joint may be opened, but the most common ones are the knees from falls, fetlock from shoe calks of other horses, pitchfork wounds, etc.; hock, elbow or shoulder from kicks from other horses or from any cause; navicular joint frequently from nail prick.

Certain series of changes take place, differing in degree according to the temperament of the animal, but mainly to the amount of septic poisoning that has taken place. We find that very soon after the accident irritative fever sets in, temperature may run up to 103 or 106, pulse from 50 to 120; at first the pulse is full and strong, but later, as the pain increases, gets smaller and harder and quicker, finally gets wiry and imperceptible, and the horse dies from exhaustion. Pulse usually runs higher in well-bred animals than in others.

The stages it runs through on to a fatal end are—first, immediately after the joint is punctured, there is a flow of synovia limited in quantity—it is clear. As it runs on, septic germs get in and cause Septicæmia, and by the irritating effects of the septic germ and the introduction of air start an acute inflammation called Synovitis; this is not confined to the synovial membrane, but involves surrounding tissue also. The articular cartilage may be involved, then we have tumefaction, an increased flow of synovia accompanied with pus; high fever develops in the course of four or five days; great pain is evinced by the animal being very restless, and is not inclined to stand on the sore leg. In many cases, especially where the hock is affected, the horse is inclined to keep moving with quick spasmodic jerks, and with all this, there is greatly increased respiration, may be from 20 to 25. This synovia that is exudated, often coagulates on the outside much the same as blood, so there is no need to ever mistake it for anything else, as pus will not coagulate like it; it will be a rather firm, gelatinous, amber-colored clot, and of itself is odorless, so if there is any odor present it will be due to the presence of pus in it. We will suppose this runs on for a long time; it usually lasts from two to four days, but may run on that many weeks instead.

In the third stage the articular cartilage is involved in the inflammation, leading to abrasion of it; ulceration develops, the articular cartilage gradually breaks down and flows out with the synovia and pus. It does not stop here, goes on and involves the cancellated tissue of the bone; the discharge in this stage is very offensive, and when this occurs you can make up your mind that it is a very serious case. Occasionally the discharge in this stage is bloody—this indicates the malignant condition of the case, and will require an unfavorable prognosis, because it will terminate either fatally or end in the joint becoming ankylosed. Next, it runs on to the fourth stage, in which Ankylosis is produced; the articular cartilage being destroyed, the exudate on the bony surfaces coagulates, organizes,

and forms living tissue; later, the whole exudate ossifies; it may be not only between the opposing ends of bone, but also around them, like a band. Now in case it terminates fatally, as the inflammation is kept up we find there is proliferation taking place rapidly in the surrounding tissues; if in the hock, it becomes very large, and new tissue forming, it becomes hard and fibrous and circulation becomes stopped here and there; we find as a result, little abscesses forming; these rot and break out and new ones form, and all this time the joint is growing larger and harder, horse grows thin rapidly, and in the course of four weeks he is a skeleton. Hunger seems to be a feature in this case, from the fever; the flanks become roughened, eyes sunken and the back arched, and the animal shows great suffering; with the sloughing of these little abscesses there is an offensive odor, and the horse dies from exhaustion. Some horses will stand, others lie down before they die, but in the majority of cases they prefer to stand. The two extremes in which these cases may terminate is from three days up to three weeks. Occasionally, we get rupture of the synovial sheath, which is very serious, but not so much so as the open joint; but when it gets well it is apt to leave a permanent thickness.

Treatment.—It is good practice to clip off the hair and wash it, but never to probe the wound of open joint; if large enough, you may explore with the finger, but be careful even in this of septic germs—best to leave it alone. Put horse in slings in bad cases. Wash with some antiseptic strong enough to destroy the germ but not strong enough to cauterize the tissues—alcohol clear is a favorite for this; anything from a sixty to a ninety per cent, or a weak solution of iodine, or carbolic acid, or bichloride mercury strength of one to three thousand, then apply dry dressing as iodoform, boracic acid, starch, equal parts, used freely. If there is much suppuration, pack it, if not, there is no need to do so, but in all cases place your packing so there will be free drainage. Never plug any wound so there is no drainage for the discharge. Sometimes where the opening is very small, it is advisable to make the opening larger to give free chance for the discharge, put in your antiseptic, well powdered on the gauze, then your absorbent cotton or oakum, then bandage. Remember, if you can keep out the septic germ you will get along all right; this germ seems to thrive in this synovia and in lymph particularly. If you apply dry dressing, it is well to have an attendant dust the antiseptic on often during the day. If it is necessary to clean, use hot water and clean cotton; irrigate it off, never trust a sponge—it may contain dirt. In putting on dry pack, use unbleached muslin dipped in very hot water, then wrung out and dipped in antiseptic. The wet pack is much more in favor than the dry one.

BROKEN KNEES.—From falls; this is a common sort of a case; the washing in this must be done very carefully, and be certain you remove all foreign bodies that may be in the wound; sometimes they are very deep; do no probing; use antiseptic dressing, as belladonna fl. ext. $\frac{1}{2}$ oz., tannic acid 1 dr., carbolic acid 1 dr., wheat flour 2 ozs., water enough to make a soft paste, but stiff enough not to run. Push a little down into the opening so that some of it will fill up and spread over the surface a little on top of this; any mixture—say linseed poultice made with hot water and let cool, put it on and pack it with ice; no septic germ can

grow where it is ice cold, they must have heat. Repeat the ice as often as necessary, the poultice several times a day.

Where there is a wound of any joint, there should be some appliance used to keep the joint from moving, as better results will be obtained and the pain lessened. The best way is to put on a shoe that extends from the foot, and have a bar turned up across this extension with a hole in the center; then have an upright bar of iron to which is riveted a band of sheet steel or iron about two inches wide, and in the shape of the limb—these are left with plenty of room to pack to prevent rubbing or friction, then you can strap the limb to this upright bar. If it is an injury to a tendon that you are treating, you can have the bar placed on the front part of the shoe in the same way.

In case of Open Navicular Joint there is more difficulty than in treating any other joint. The proper treatment is to have the hoof pared out thin; make your opening large enough to treat antiseptically. There is so great danger of the septic germ getting out of the filth in the stable into the foot so much quicker than into any other part, that we must wash out thoroughly with the antiseptic and use great care in keeping it clean.

DISEASE OF THE BONE.—All the lower animals are subject to these, but the horse more so than any of the others, because of high feeding and the rapid gait they travel—some are looked upon as being hereditary. The bone in health is insensible, but in disease is very sensitive.

OSTITIS.—Is inflammation of the bone substance.

PERIOSTITIS.—Is inflammation of the bone covering.

OSTEOMYELITIS.—Is inflammation of the marrow.

These three are very difficult to separate, because they involve each other more or less, and we don't try to separate them here.

Etiology.—Usually the result of some external injury; concussion in many cases, and also a predisposition, as hereditary would be. Inflammation of the bone has the phenomena as in connective tissue, and is attended by very many of the same changes, but on account of the peculiar dense basement substance we find peculiar results. We have as a result of inflammation in the bone, serum, fibrin and pus the same as in other inflammations, but in a less amount. We find first, change in the basement substance, absorption of the hard basement substance to a greater or less extent, and the animal matter in excess, due to a replacement of the hard substance by soft tissue; hence we have then a deficiency of the earthy or mineral substance. Second, this newly-formed tissue after a time becomes ossified, but is a different sort from the normal bone; there is an increased vascularity of the bone, sometimes a decrease in the vascularity. This newly-formed marrow or substance is called granulating tissue; it finally becomes hard and dense and the bone is much enlarged, but much lighter than originally. This is called Osteoporosis, and is the most common form—this is the rarifying process.

OSTEO SCLEROSIS.—Is the condensing process; in this there is newly-formed tissue also, but the original bone is not absorbed as in Osteoporosis, but the marrow canals grow smaller and are more filled up by this new tissue, so we have a more dense bone substance, but at the expense of the marrow spaces, and the bone becomes much heavier than the normal.

ABSORPTION OF BONE.—That is the earthy matter; occurs generally

through certain large cells, called osteoclasts. We find these cells grouped around the nutrient blood vessels; the lacunæ and the canalicula often coalesce, and the matter is replaced by the soft new tissue. When a bone is cut across, it appears to be of a red gelatinous appearance, especially the marrow, and is often a soft mass of granulating tissue; this is often seen in Synovitis. In Bone Spavin we get Anchylosis without any break in the skin. Ostitis is set up and runs through these different stages, and the rarifying does not confine itself to the bone, but involves the articular cartilage; bony spicula are shot out into the joint and perhaps into the surface of the cartilage, absorption takes place, new tissue is formed, and Anchylosis follows.

Sometimes this inflammation extends from the cancellated bone tissue to the compact and softens it, and several layers may be laid on between the periosteum and the bone surface in concentric layers, and the bone becomes larger. Osteo Sclerosis also develops from another kind of cells that group around the blood vessels, called osteoblasts; these both are always present, and the one that predominates the result is in accordance; either of these may exist in the same bone, or both may exist at the same time in different parts of the same bone, or even in the same place.

SORE SHINS.—In young race horses is a common form of Ostitis, predisposed by high living to develop fast and too much galloping. Prof. Mc Eachran says that too much hand rubbing also causes this trouble in race horses—they get too much care.

PERIOSTITIS.—The effusion occurs both above and below the periosteum, and may harden on the inside or on the outside.

OSTEOPHYTE.—Is bony enlargement on the surface of the true bone, caused by the hardening of the exudate.

Symptoms.—Lame, sometimes very much so, moves with difficulty, arches the back, etc.

Treatment.—Cold applications applied early is the best; this is true in all diseases of the bone, even to the extent of refrigerants. This arrests the vitality of the part, and should be kept up until the acute symptoms disappear, which often takes place in about ten days, then let the animal go for a while to see if the symptoms return. If they do, repeat the treatment; you may apply a mild blister, as iodide mercury and lard 1 to 7 or 8 parts; fly blister, and lard 1 to 3 parts, mix the two together and apply them in equal parts. Knuckling and Knee Sprung are usually the result of Sore Shins, but there are also many other causes for them.

CARIES.—Is ulceration of the bone; in other words, it is molecular death; Osteoporosis is often associated with it, and may involve Periostitis; it usually occurs in the cancellated bone tissue, generally caused by external injuries, such as broken ribs, etc., also often seen in fistulous withers, caused by the pus burroughing down to the bone. When there is Caries, the depressed surface has a peculiar feel; they have bony spicula sticking up, and between these there is a velvety feel; this is often seen in Poll-evil, and may involve the axis or even the dentata—decayed teeth are an example. With it there is usually an offensive discharge.

Semeiology.—Always more or less swelling of the part, with fistulous opening, and particles of bone are found floating in the pus; this

pus is called sanies pus, and is acrid, will blacken a silver probe; the bone is soft. Foot Rot in sheep and cattle is often followed by Caries.

Treatment.—On general principles, open up the sinuses and scrape out all the diseased portion of the bone and a little of the healthy part as well; treat antiseptically and the bone will granulate the same as other tissues; fill up the cavities with antiseptic and pack over—this prevents suppuration and allows granulation to take place. To stimulate the growth of bone, touch once or twice a day with hydrochloric acid diluted with water, one to sixteen, direct to the bone with a swab; don't touch the soft tissues. After a few days use the hydrochloric acid diluted one half.

NECROSIS OF THE BONE.—Is death of the part, caused by the nutrition being shut off external to the bone; this is usually caused as the result of injury to the periosteum and diseases of the marrow, shutting off the supply of nutrition; in that way it resembles dry gangrene. We see Necrosis sometimes suddenly develop from external injuries to the bone, as seen in the bars in the mouth by the bit; the bone necroses, and large chunks drop out by sloughing—it takes about ten days for this to slough off, and the part of the bone that sloughs off is called the sequestrum. When the shaft of long bones dies this way, it usually softens and liquifies and flows out through a fistulous opening; sometimes it is a large opening in the bone and several in the soft tissues, or it may be one opening in the soft tissues and several in the bone. The discharge is ichorous while the shaft of bone is running out—this way there is new bone forming under the periosteum. This disease occurs more in the human than in the lower animals; the new bone is lacking in the characteristics of the normal bone, but does very well.

Treatment.—If on the limb, it is good to use slings, except where the horse shows an inclination to lie down; soon as pus can be located, open up and let it escape, and if practical, also remove all the dead bone. In Necrosis of the bars of the jaw (lower one) it is not always necessary to operate except where very sore and swollen, then with your scalpel cut several openings down to the bone; this will allow the escape of pus and quicken the suppuration of the part if necrosed, and if it has not yet started to necrose, it may prevent it. Always cut down through the periosteum, then let alone until the pieces come out; don't force them out or use forceps. After they are removed, wash out with antiseptic, sponge with a mild solution of carbolic acid, say one per cent, or boracic acid three or four per cent, three or four times a day. They usually make a nice recovery. In case it is the lower bars of the mouth, when getting well, use the common link bit or rubber covered one. If the shafts of long bones are affected, make a large dependent opening by trephining, remove the sequestrum and wash out the cavity twice a day with antiseptic.

INTERSTITIAL ABSORPTION.—Is in reality atrophy of the bone, which wastes away and is absorbed; this usually takes place only in the cancellated portion, sometimes it extends to the compact tissue; this becomes transformed in cancellated tissue or is much softened. It is not an inflammatory process, though it might start as an inflammatory disease from some injury; in this case the bone becomes diminished in size and weight, and when this happens in the bicipital groove it allows the patella to become dislocated very easily. This trouble is incurable,

though internal treatment would be rational—such as iron, arsenic, etc. It usually occurs in old animals.

EXOSTOSIS.—Is enlargement on a bone, or bony tumor; develops as result of inflammation and phenomena attending it. Ossification of exudates.

CONSTITUTIONAL OSTEOPOROSIS OR BIG HEAD.—This is one of the most peculiar diseases we meet with, and know the least about; there are a great variety of opinions on the etiology of it, but we know that pathological changes take place identical with localized Osteoporosis. Some think it is rheumatic, others that it is due to a parasite, and consequently infectious. Dr. Baker thinks it to be a specific disease due to infection, also distinctly a blood disease, as it affects all parts of the body. It is often found on breeding farms, and often affects a large number of horses, but it never affects any other animal but them, under all circumstances. No idea what the cause is, but we frequently find it following some other disease; it is more common in driving horses than in running. In this trouble we usually find the urine thick and mucilaginous, horse chuffed up in the flanks, arched back, and inclined to lie down a great deal—the affected bone is probably painful; the appetite keeps good, but the horse grows thin rapidly. Often the first sign is a peculiar lameness—this is intermitting and usually across the loins, but cannot be located, and is often taken for rheumatism. This disease is not confined to the head alone, any bone of the body may be affected, and when the bones of the head are affected those of the limbs are usually affected, somewhat softened, and often the horse will go to pieces all at once. This disease is much more common in the South than in the North. Some of our graduates in the South claim to get good results from using iodide potash, and trephining into the enlargement, and injecting antiseptics, or by applying biniodide mercury and iodide potash internally. We find this treatment to be a total failure here. In autopsy we find the face bones so soft that you can run your finger into them; they are red and vascular, more like granulating tissue. When in the maxillary bones the teeth become loosened.

In acute cases death takes place in two to three months, others run for two to three years. Hyposulphite of soda and calci precip. phosph. in equal parts three times a day, is good, also a complete change of diet is recommended, and a change of location.

OSTEOMALACIA OR MOLLITIES OSSIIUM.—Is a softening of the bones by degeneration, and then absorption of the earthy salts. It exists to a certain extent in females in pregnancy, especially in the last two months. It is rather common in the human, but rare in the lower animals. Cause is unknown, and treatment seems to be useless, but whatever it is it seems to be malignant. Origin—in the nutrient cells at the periphery of the Haversian canals.

FRAGILITIS OSSIIUM.—This is a hardening to the extent of brittleness, and only occurs in old animals; due to absorption of the animal matter, and inflammatory troubles; this matter is deficient and repair is difficult. In this condition fractures are very easy to occur. There is an excess of earthy salts over the animal.

EBURNATION OR PORCELANEUS CHARACTER.—This usually affects the articular surface of bones, and the articular cartilage becomes involved

in the inflammation and is destroyed; the cancellated tissue of the bone may be affected with it. We believe that in incurable cases of bone Spavin, this porcellaneous condition takes place. There is no vascularity in the part; this condition of the bone causes a permanent lameness.

RACHITIS OR RICKETS.—This is a degenerate softening of the bone, or softened condition of it, and is found only in the young; it is due to some disturbance that prevents ossification of the bone. It really is a constitutional disease; there is a condition of mal-nutrition that affects only bone. It is the same in human as in the lower animals, and in autopsy we find the bones very porous, or will become so on boiling, proving too much animal matter. It may develop at any time; animal may be well up to two, three or six years, then be affected. Usually seen in little animals three or four months' old. It is very common in puppies fed on starchy food; the first intimation of it is a peculiar lassitude, and in play is not lively; the long bones of the legs begin to bow, especially in the front legs. Foals and puppies are very apt to have it.

Treatment.—A complete change of food; in the foal, wean him and feed on cow's milk liberally, say a gallon three times a day, and more as he grows older. Skim milk, even if it is sour, is better than fresh milk, because it contains less fatty matter; in addition, give bone dust, oatmeal, but no corn or anything that tends to fat. In puppies, change the food; give boiled meat with oatmeal, make strong stew of it. If you notice that the legs in foals don't get strong, apply splints and bandages applied loosely; make them light and strong, and see that they don't chafe the legs. Lime water is good to give to foals, also to puppies. Cod liver oil is good for puppies.

FRACTURES OF BONES.—This is a solution of continuity of a bone. It is affected in three ways—first, by direct violence to the point of fracture; second, violence applied at some distance from the point of fracture; third, by inordinate action or contraction of the muscles—we see this last in cases where the spine is ankylosed, as it sometimes is in the lumbar region, the animal being cast, the inordinate action of the muscles on that part causes a fracture of the part. There are certain bones that are more liable to fracture than others; these are, first, the pelvis, usually caused by falling, and not being a very strong bone is easy of fracture; cannon bone, usually from falling, then the radius and tibia, from kicks of other horses; ribs quite often from kicks and collisions; os suffragines and os corona from violence of some kind; humerus or femur do not often get fractured. In dog we usually find it is the tibia, radius or ulna that get fractured. The facial bones of the horse are liable from kicks and collisions. We may say any bone in the body is liable to become fractured; those of old animals ten times more so than those of the young.

The directions of fractures are—transverse, or broken square off; obliquely, or in an oblique manner; longitudinal, or split in different directions—this happens more in hunters, and to the os suffragines, due to jumping.

SIMPLE FRACTURE.—Is when there is no other injury to the surrounding tissues; complicated, when there is a severe injury to the surrounding tissues in the form of contusion, lacerated blood vessels, or joint opened; compound, when there is an open wound communicating with the fracture—it matters not whether the wound was produced at the

time of the fracture or from the points of the broken bone, it matters not what the cause may be; comminuted, when the bone is broken into several or more pieces—shattered; impacted fracture is where the broken ends are driven into each other; partial fracture or Greenstick fracture is where the bone is partially fractured but there is no displacement, or it is where a bone is only cracked.

Semeiology.—Usually great lameness suddenly develops, even if the fracture be only partial; this lameness may not show at first, but after the inflammation sets in, which may be in twenty-four or forty-eight hours, it is often hard to locate the lameness. It usually takes from four to six weeks for a bone to unite. In case the fracture is in the femur or humerus, it may not be visible, but can be told by the preternatural mobility. Wherever there is a break there will be crepitation on manipulation; total inability to bear weight on the limb. In transverse fracture without displacement, the horse may be able to bear his weight until it gets sore.

Bones unite if given a chance; all we can do is to set them, and nature must do the balance. This placing in position is also called *in situ*. There is intense inflammation set up and the bone becomes extremely painful and sensitive; there is a constant ache and great soreness often on pressure. This inflammation is a rarifying osteitis and extends up into the bone one or two inches; there is an extensive exudation of plastic coagulative lymph thrown out into the fracture and into the bone; this coagulates and organizes and forms callus, and this exudate ossifies. A bone is stronger at the point it was fractured after healing than it was before, due to the bony bandage around the part. It is a popular idea that horses' bones will not unite, but they will if they can be kept in position long enough. Dogs, sheep and young steers take care of themselves and assist us, but the horse never does—that is why we have such poor success with them. When the bones fail to keep in position they become intensely inflamed, and this is kept up until gangrene terminates the life of the animal.

Treatment.—In case of Greenstick fracture, or partial fracture, cold applications with bandages are sufficient. This sort of fracture generally occurs in young animals. If the fracture is complete, get the horse into a stall and put in slings, then set the bone; this must not be delayed. If it is ten or fifteen hours before you see the case, and there is inflammation, don't stop to reduce the inflammation, but set the bone first. If the pain is great, then give anodynes or anesthetics, but 1 or 2 ozs. of chloral hydrate as a drench is the best of all. Now that the horse is in slings and the bone set, you want to keep it in place with splints and bandages; these are best made of wood, or, for the horse, also of sole leather soaked first in water; paste-board will do for dogs. Have your splints strong and light; a good way is to spread plaster paris on your bandages as you are wrapping them on, or have it spread on the bandages first; pad the leg well to keep the splints from chafing, also the ends of the splints. Keep weight of the animal off the lame leg; a good way is to build a platform about four inches high and level, cut a hole for the lame leg and tie so the leg will be held about the middle of the opening. Horse requires about six weeks, in the young, for the bone to unite, but in the old it may take twelve weeks. When well, let the animal down

gradually, say in the day, and put in the slings at night until strong. A compound fracture in the horse is very unfavorable and as a rule is always fatal.

FALSE JOINTS.—Often follow fracture, through no fault of the surgeon, but a peculiarity of the animal. The exudate fails to ossify and becomes fibrous tissue instead of bone, and the animal has a false joint through life; this occurs in dogs and in the human.

HIPPED.—A horse is said to be Hipped when the shaft of the ilium breaks and drops, or allows the part to drop down, or the anterior or external point of the ilium breaks off; this causes great lameness, but it gradually wears away and the horse gets used to it in two or three months, and may be useful for all ordinary purposes. Sometimes a small piece is fractured from the point of the ilium and drops down and causes an abscess; this must be cut down to and removed. When the fracture occurs in the acetabulum, it often causes permanent lameness. In bandaging the leg of dogs you can use rosin or pitch as well as plaster paris; where there was much swelling before you bandaged, you will probably have to remove the bandage in order to tighten it when the swelling goes down, or where the limb swells afterwards it will have to be loosened, or where the part below the bandage gets cold, then the circulation has been interfered with and you must loosen to allow circulation.

DISLOCATIONS.—A joint is said to be dislocated when the articular end of one bone is displaced from another. When wholly displaced it is said to be complete; when not completely displaced it is said to be partial, and is often spoken of as Luxation. Dislocations are simple when no external wound communicates with them, and compound when there is such a wound. With all cases of Dislocations except the patella, there is severe laceration of ligaments, the capsular in particular. In Dislocations of the patella there is usually severe stretching or a previous relaxing of the internal ligaments—allowing the displacement; this always goes to the outside of the limb. Other causes of Dislocation of the patella are, when the internal lateral ligament becomes relaxed and the muscles on the external contract, also sometimes the external eminence of the femur becomes absorbed, allowing the patella to slip off. There is often a partial Dislocation in young animals, due to the lack of balance of the muscles; the outside ones being stronger than the inside ones—this occurs when the leg is severely straightened out. Straight-legged animals are more liable to it than those more angling; floors sloping downward and backward are bad for this same reason. The Dislocation of the patella is about the only kind we meet with, but any joint is liable to it. Prof. Williams records a Dislocation of the shoulder joint, and Prof. McEachran a Dislocation of the hip. Knuckling of the fetlock from flexion of the tendon is a kind of partial Luxation, and is thrown back by tenotomy. Dogs are liable to Dislocations much like the human. With the exception of the patella, these Dislocations are always the result of violence. Rupture of the ligaments at the time of the Dislocation causes great inflammation, swelling and lameness. Dislocations are not necessarily fatal, but if they are not reduced, False Joints will be formed and the animal be useful, at least for breeding.

Treatment.—Ascertain what joint it is, then extension and traction are necessary; usually in this case it is necessary to give anæsthetics, then

extend the limb and use traction in the direction it should go, and hold on for a time till it is replaced. After reducing the Dislocation, keep in place by the use of splints and bandages, same as in fracture. Always have the joint straight in the splints; never allow a joint to be flexed, as the muscles may contract while in that position and remain so when taken off; this is true in using the splints in any case.

Symptoms.—The patella being dislocated allows the muscles to relax, and the leg straightens and stretches backward, the foot is usually drawn backwards and bent upward by the flexion of the tendon. Tie a rope or strap around the pastern of the affected limb, have an assistant draw the leg forward and close to the floor; have assistant sit down, now with your pails push the patella in and backwards, try to get the angle straight and the patella will go on easy; after you get the patella on, it may be difficult to keep it there, especially if the ligaments are ruptured. Place the horse on a level floor, or higher behind; put on high-heeled shoes, say two inches high, and projecting backwards about two inches; have heels wide apart, and broad, low toe. Sometimes we find it necessary to tie the leg forward, then also have the horse fastened behind; or a good way is to fasten the rope to the collar to keep drawn forward, then all you can do is give time to get well. You may use anodyne liniments; after five weeks it is good to put on fly blister. Let the shoe down by degrees.

Prognosis.—Should always be modified by saying, a joint once dislocated is predisposed to repetition. It is well to keep in slings four or five days. Where Luxation occurs in young animals by the difference in the muscles, it is done without any violence whatever, and seems to be spontaneous. One cause in horses is the relaxing of the tendons by having the animal standing lower behind. Sometimes it is very hard to replace Dislocation of the patella, and you may require extra assistance, but other times it is very easy, especially in young animals. There is no inflammation and little lameness in this partial Luxation in the young. After you get the patella back, it is well to bathe with hot water for a time to relax the muscles on the outside, then apply soap liniment on the outside; repeat three times a day to prevent irritation. It is best to dilute the soap liniment one half, and apply with a great deal of friction. If the Dislocation has run long you will find considerable trouble in reducing it, as there will be swelling, and the ligaments stretched. In the symptoms there will also be a bulging of the part.

WRY NECK.—We think is generally caused by Luxation; the ligaments on one side being relaxed or ruptured; this may occur from falls. In fresh cases we try to help them; put two wide boards on the sides of the neck and pad the bulging side, use some pressure, and the ligaments coming together will grow together.

TUMORS.—These are defined to be any prominence or growth, unnatural, on the body, or on any organ, or in a gland. A Tumor may be composed of the same tissue as where it grows; it is then said to be homologous; but it may be entirely dissimilar, then it is called heterogeneus; heterologous. As a rule, Tumors are of the latter class; they are very seldom composed of the same tissue as where they grow. Tumors grow by self-proliferation the same as other parts of the body; new blood vessels and lymphatics extend into the growth, and as it grows they fur-

nish nutriment for the new growth. The nutrient blood vessels are usually, in these Tumors, very much enlarged. If it starts in a pre-existing blood vessel, as the Tumor grows the blood vessel enlarges to supply it; occasionally, but rarely, nerve fibres extend into it. As a rule, Tumors are insensible and are subject to all the changes that take place in any other tissue, such as fatty degeneration, suppuration, ulceration, gangrene, pigmented, or may become fatty or calcified. Occasionally Necrosis takes place, often to such extent as to almost entirely destroy them, but never completely. Oftentimes when Necrosis stops, it will heal over and remain so for a long time, then will start to grow again without any cause. Tumors from some cause or other, probably from disturbed circulation, suppurate as a rule, but in all, pus and little abscesses form in the Tumor; then these abscesses discharge, granulate, and heal over, and others crop out. Tumors take various shapes and forms, usually described as resembling some object. Tumors are nodular when they resemble nodules; tuberous, when they resemble a tuber. Fungoid is cauliflower-shaped, but takes the name from the way it springs up. Polypoid, resembling a polyp; those forming especially on the mucous membrane. Papillary, when they are shaped like the crater of a volcano. Dendritic when they have roots or branches, and the origin of these is in their primary cells at the bottom of the roots. Tumors are single or multiple; this is particularly so in Black Cancer, as seen around the tails of white horses. These are Melanotic Tumors.

A Tumor may be circumscribed, having no connection with the loose cellular tissues of the body; other times it seems to be intimately mixed with the growth. Tumors are sometimes capsulated—these don't do any harm except by their unsightly appearance; other times they produce great harm by pressure on the surrounding parts, often causing displacement of other organs, or atrophy of the parts pressed upon; as also Necrosis from shutting off of the circulation, or pressure on blood vessels, causing oedema, varicose, or thrombus; sometimes on joints, causing more or less Luxation, or on the bones, causing absorption or Caries. They sometimes grow on the inside by increase of cell element and expansion, then they are said to have central growth or concentric; other times they grow on the outside, then they are said to be peripheral or eccentric growth. Tumors are either malignant or innocent. Malignancy of Tumors is shown by the following phenomena: First, invasion of adjacent tissues by eccentric or peripheral growth; second, when they have a tendency to local recurrence after removal; third, formation of metastasis—that is, when removed from one place, they grow in some other part; fourth, a tendency to interfere with the nutrition and well-being of the body, causing a condition known as cachexia. This is the condition in which there is anæmia, loss of flesh, lassitude, emaciation, running on to miasma, faulty nutrition, blood poisoning, and death from collapse—this usually occurs from absorption of putrefactive matter, causing Septicæmia.

Etiology.—Causes of Tumors are very obscure, as a rule; oftentimes entirely unknown, but other times quite perceptible; for instance, perceptible cause may lie in mechanical injuries—as kicks from horses, and blows, unnatural pressure, as shoe boils, collar boils, etc.; also Scirrhus of the Cord, caused by invasion of the botryo mycosis following castra-

tion. Heredity plays an important part, but how, we don't know. Conheim's theory is that most Tumors, or all true Tumors, that have no mechanical origin, have their origin in a faulty embryonal development, due either to misplaced cells or to superfluous cells, and may occur in any tissue; but the Tumors do not develop immediately, but only when favorable circumstances permit them to; what this might be is not known. They are not often developed till late in life, usually about adult age. In horses, as Black Cancer, they develop about the age of ten or fifteen years—hardly ever in the young. Some authors claim that the character of the Tumor can be recognized by the shape of the cells, others say it cannot be, consequently we come to the conclusion that to diagnose the Tumor, we must see the character of the surrounding tissue, as well as the condition of the animal. A Tumor should be viewed as a whole by cutting into it, also from the effect it has on the well-being of the animal.

Classification of Tumors is regulated according to the tissues in which they grow. They are divided into six large classes, and each class is subdivided:

First Class.—Histoid or connective tissue Tumors; these are composed of the same tissue as that in which they grow. Then there are eight in this. First, fibroma—fibrillar connective tissue; second, myxoma, composed of mucous tissue; third, sarcoma, composed of embryonal tissue; fourth, endothelioma, composed of endothelial cells; fifth, lipoma, composed of fat; sixth, chondroma, composed of cartilage; seventh, osteoma, composed of bone; eighth, glioma, has its origin in the neuroglia, that is, the fibrous interstitial net-work that supports the central nerve centers, as the brain and spinal cord; also the nerve expansion of the retina.

Second Class.—Myomata are those which grow out and are composed of muscular tissue. There are two classes in this—one from the smooth or unstriated, called leiomyoma; the other from the striated, called rhabdomyoma.

Third Class.—Neuromata, which are composed of nerve tissues.

Fourth Class.—Angiomata, this is a vascular tissue Tumor—first, angioma (cavernous); grows in the blood vessels or from the blood vessels; second, lymph. angioma—growing in the lymphatics.

Fifth Class.—Epithelioma, composed of epithelial cells—first, adenoma—growing in the gland tissues; second, carcinoma—epithelial cells pure and simple.

Sixth Class.—Teratomata; are the mixed Tumors, those that are composed of tissues of more or less of all the others. The mixed Tumors are complex; they are of course congenital, and may be composed of two or more kinds of tissue. The theory is, that in early embryonal development the stronger envelops the weaker or smaller; fœtus, as we often find in different parts of the body, or in different organs, are this sort of Tumors. Cysts are also counted as Tumors. Teeth are often found in different parts of the body, and also hair, but oftener around the genital organs.

CANCERS (CARCINOMA).—In the lower animals, are divided into four kinds—hard, soft, epithelial and black. The hard is sometimes called Scirrhus, especially by the old writers; it is very malignant. These are very hard and dense, and of white tissue; when cut through, sometimes it is of an even hardness, other times it has hard projections extending

from the Tumor into the organ to which it is attached. These Tumors cut something like cartilage, and when cut through the center, the surfaces contract and become concave. When cut into, hemorrhage is very free and even, as it is not from any large vessel, but from the capillaries; this feature alone sometimes makes it difficult and dangerous to operate on them, it being hard to arrest the hemorrhage. These hard Tumors have a tendency to break through the organ in which they are growing, and invade surrounding tissues. They seem to have a special liking for the lymphatic glands. If such Tumors do not interfere with mastication or some other functional action (vital), they produce little or no harm until they ulcerate, then as the ulceration increases, fungus growth springs up, hemorrhage occurs easily, sometimes spontaneously; Septicæmia occurs and produces irritating fever, which produces exhaustion and finally collapse and death.

Treatment.—Early removal with the knife is the only treatment, otherwise removal is a failure. Prof. Williams quotes Prof. Bennet, that these Tumors may be destroyed by injecting a weak acetic acid, in that way destroying the cancerous cells.

SOFT CANCERS.—These are seen in two different kinds—medullary and colloid. The medullary develops in circumscribed forms; this one is very common in the human, and is divided into a number of classes, according to the idea of the writers.

FUNGUS HÆMATOIDS.—Are those seen growing in the eyes of cattle—cephaloma in the brain. Then there are the encephaloma, encephaloid, medullary fungus, etc., all meaning the same Tumor. This may be found in any of the tissues, but mostly in the glands; often seen in the horse on the penis, and may, if let alone, extend to the testicles; also on the vulva of a mare. It sometimes affects bones, as also seen in the submaxillary space and in the submaxillary glands; sometimes arises primarily in the periosteum. It may present itself as one Tumor, or as a bundle, that is single or multiple, usually enclosed in a capsule, but when broken down they are separate bodies. This kind of Cancer to the touch has a slow feel of fluctuation, as if the pus was in the cavity, but there is no pus there; but you will get a profuse hemorrhage by cutting into them. Around these Cancers you will see a net-work of veins, sometimes ten times their usual size; this feature alone makes it difficult to operate; often seen in the mammary glands of bitches, and it is not uncommon to lose a pint of blood in the operation, no matter how careful you may be. In the course of time, these Tumors suppurate and then go on to ulceration; then we have tuber granulation in every case, as seen in the eye. The medullary matter of this kind of Cancer (the contents) is soft and can be spread and mashed; it resembles brain matter, but is a reddish color. When this cut surface is scraped there is a free flow of juice; this juice is very malignant and will affect any wound it may get into. This Cancer often has for its origin a simple amount of violence, but we believe there will be no Cancer unless there is a predisposition, or it has a pre-existence; in other words, it is in the infant at time of birth.

COLLOID CANCER.—Is composed of fibrous tissue. It arranges and makes a net-work of little cavities, varying in size; they contain a soft matter nearly liquid, resembling melted butter; sometimes it is amber-colored, sometimes grayish or greenish yellow; it resembles half-melted

glue in consistency. The density of the Tumor as a whole depends as follows: If the fibrous net-work predominates it will be hard; if the matter predominates it will be correspondingly soft.

EPITHELIAL CANCER.—This is quite common, and is composed of epithelial cells, very mild, spoken of as cancrioid or mildly cancerous. This consists of the fibrous stroma, in which the papilla and epithelium are greatly enlarged and multiplied. The cells of this growth differ very little from the natural condition; the minute forms deviate least from the tissues. Its history shows but little malignancy; its favorite site is in the mucous membrane—around the vulva of the mare, and in bitches around the anus, lips, etc. They are not so common in the lower animals as in the human. They are easily transplanted, as from the lips, and may transfer the cause also.

BLACK OR MELANOTIC CANCER.—This is very commonly spoken of as Melanosis. These like most other Tumors, are sarcomatic in their origin. The cells in all these retain their embryotic shape; they are round, fusiform and melanoid, and we find that those having the most round cells are the most malignant; they resemble leucocytes in the blood. Each cell contains an abundance of pigment, giving a black color to the Tumor. We find these Black Tumors have every feature of malignancy, contrary to the opinion of some authors (English). Sometimes they develop very suddenly, acutely, growing very rapidly, and when they affect the locomotive organs they produce great lameness. They usually develop in gray horses when they are whitening from age, which is about seven or eight years, when these Black Cancers are quite common. No tissue of the body is exempt from them, and they are liable to recurrence. We find their favorite site is the vulva of the mare, the anus, and the bare part under the tail, and often when removed they develop in some other place—that is metastatic. They suppurate, granulate, and also ulcerate first, the same as other Tumors, but the absorption takes place slower, and Septicæmia slower. Removal is the only treatment, if on the outside and small.

NON MALIGNANT OR BENIGN TUMORS.—The ordinary fibrous Tumors, as a rule, belong to the sarcomata, and are situated where fibrous tissue is plentiful, but not necessarily. Typical fibrous Tumors arise from a local irritation attending an injury, and are composed of white fibrous tissue blended with a little yellow elastic tissue.

POLYPUS.—Is a typical illustration, developing in the nose, although it may develop in any of the cavities. This Polypus is attached by a pedicle; when in the nose it usually projects downward through the nose, sometimes backward. In the horse it is sometimes so long as to interfere with the epiglottis, followed by great difficulty in breathing; produces usually, when in this condition, a sort of snoring or snuffling, same as heard in the pug dog; usually produces a discharge streaked with blood. When dissected, a cavity is usually found containing a limpid fluid.

Treatment.—The nicest way to remove these is with the wire ecraseur, even if it is tuberosus in form. Sometimes where the neck of the Polypus is small you can twist it off with forceps. After removing, wash out with per chloride iron—one dr. to a pint of water—twice a day.

FIBROUS TUMORS.—Sometimes arise in the dura mater, causing a bulging out of the cranium, instead of pressing on the brain.

Treatment.—Best removed by trephining, removing the bone, then removing the Tumor. An interesting polypus is often seen in the uterus of the mare, but cannot be seen in the vagina except when the mare is lying down, as it usually goes back when the mare is standing. These sometimes grow to a large size. They are often caused by hard pulling. It requires particular attention to diagnose one of these from a case of everted bladder, which it resembles almost identically, but there is a difference in the mucous membranes; that in the bladder being more velvety, and in the everted bladder, on the neck you will find two openings, and by noticing closely you can see the urine trickling down. If it is a Polypus, insert a catheter until you remove the Tumor. In case of IMPERVIOUS HYMEN in filleys, might not be noticed till the animal was two or two and one half years old; it looks like a Tumor.

Treatment.—Cast the animal with the rump a little down hill, insert your hand and catch a fold of the hymen, insert your ecraseur and remove quite a good piece of it; it is quite vascular, but that will not hurt. There will be a discharge of the accumulated matter that was pent up inside.

NOTES ON OBSTETRICS.

RETENTION OF PLACENTA.—Placenta is sometimes retained within uterus, and the fatty degeneration of it does not take place completely, for uterus contracts very rapidly on it after delivery, holding it mechanically. Some take away placenta by tearing it away, and produce severe hemorrhage in cows as well as in mares.

Cause of Retention.—Depends on health of female; a thin half-starved cow will retain her placenta, while a very fat cow will also retain it.

Prevention.—If cow is a little thin, feed her a little meal for at least three weeks before parturition. If fat, give a purgative two weeks before parturition, and short rations for a week, and during last week feed her up a little. Placenta if retained should not be allowed to remain more than from four to eight hours in cow, and from two to three hours in mare.

Treatment.—In mare, introduce hand and use a little friction on the inside of uterus. In mare it usually comes away in from two to three minutes after foaling; in women, from five to thirty minutes. In cow, on account of its attachment to the cotyledons, which are very vascular and placenta is attached over them, put one hand in and the other outside, and by manipulation get up to it and pinch cotyledon on the outside and pull away placenta. You may find from three to four cotyledons; when they are all unbuttoned, flush uterus out with carbolic acid solution one half of one per cent, four or five degrees warmer than temperature of body. In human, two per cent solution of boracic acid. Some use bichloride of mercury, but Dr. Baker does not recommend it, as it is liable to produce Dermatitis.

POST-PARTUM HEMORRHAGE.—Is bleeding after parturition, as a result of too rapid detachment of placenta from uterus before blood-vessels have had time to be contracted upon, or may be due to rupture of some of the cotyledons; not usually severe in the lower animals.

Treatment.—Teaspoonful of fl. ext. ergot following delivery, and repeat in ten or fifteen minutes if necessary. If this is not sufficient, inject

warm water into uterus at a temperature of 125° to 150° , and dash cold water over loins.

INVERSION OF UTERUS.—Is turning uterus inside out.

Causes.—Failure of uterus to contract properly, or after-pains keeping up abnormally strong and long.

Treatment.—Wash uterus and have assistant hold tail up or out of way. Wash in tepid water and put laudanum in, or put powdered opium in uterus after washing, and put on warm milk or mucilage or linseed tea after lotion; then have cow standing. If inclined to strain, give chl. hydrate, sulphuric ether, or chloroform enough to stop straining.

TUMORS CONTINUED.

TUMOR IN THE LEVATOR HUMERI.—Just above the point of the shoulder generally. This is really an Abscess oftentimes less in size than a walnut, often much smaller, but the inflammation in the muscles around the Tumor is great and intense, with swelling and great lameness.

Cause.—Some think it due to the pus germ, but Dr. Baker believes it is due to local injury. We usually see it in draft horses and in the season when the roads are rough, and hauling heavy loads; from jerking of the collar, the part often gets pinched or bruised. These Tumors are deep seated.

Treatment.—There is a great variety of opinion as to how they should be treated. Best treated by treating as simple Abscesses and removing them with a knife. Usually when called they are a couple of days old; there is swelling and considerable soreness; recommend poultices or hot fomentations, continued for a week or nine days, to allow the pus to form, then remove the poultices, clip off the hair, cut the skin about two inches long over the Tumor, then insert a long-bladed scalpel in the center, insert slowly; you will find it hard and resisting until you reach the cavity, when the resistance will lessen; that is the way to know that you have reached the cavity. You may have to insert the knife from two to four inches in order to reach it. If you don't strike, as it is often very small, withdraw the knife a little way and change the direction a little; then it is well to enlarge the opening. Always insert the knife parallel with the direction of the muscular fibre, then evacuate the pus and wash out with some lotion, as tinct. iodine or strong solution of chlor. zinc, or bichlo. mercury—anything that will cauterize mildly to destroy the pus germ but not destroy the tissues; this will set up a healthy inflammation, and granulation and healing. I usually use a poultice, sterilizing it with hot water and a little carbolic acid; keep the poultice on ten or fifteen days. It will require about six weeks' rest for the draft horse, but a horse driving in collar might do in four weeks. If you are called early to a case, the chances are favorable for recovery. The average doctor takes these for fibrous Tumors and wants to cut them out; in doing so they remove considerable of the muscle, which is never replaced, and heals, leaving a hollow in the muscle. This might be necessary in a very old case, yet I find I can cut into them and remove the inspissated pus, if present, and by poulticing and afterwards using cantharides blister two or three times, get good results. Prof. Liautard punctures with a hot iron instead of a knife; I prefer to use the knife where it does as well, and I think better, than with the hot iron, which looks too much like a

blacksmith's way. In chronic cases open up the Tumor, cauterize a little first, then treat as a simple wound.

SIT FASTS AND COLLAR BOILS.—Are fibrous Tumors, produced by long-continued pressure, not strong enough to cause Necrosis, but a moderate amount—sufficient to form a Tumor.

Treatment.—Removal of these with the knife is the only treatment. Sit Fasts are often found as a hard leathery skin; gangrene takes place so slowly as to allow it to mummify. It must be cut off with the knife or scissors, deep enough to reach the healthy tissue. Always make your incision perpendicular, wash out with antiseptic and treat as a simple wound; usually makes a nice recovery; requires about three months' rest.

WARTS.—Are little Tumors; they are the most peculiar of all the Tumors on account of their sudden coming and often as sudden going away. They are simple Epithelial Tumors. In special pathology there is a thickening of the epidermis by an accumulation of desquamated epithelial, and enlarged by hypertrophy of the true skin.

Treatment.—Cut them out, though when they are very numerous it is impracticable to do this. They may be removed by the application of dilute acetic acid, lemon juice, or other mild acids; it is useless to cauterize or cut them off with silk. We find warts most common in the mouths of dogs; sometimes they are so numerous as to cover the buccal membrane, and when in such numbers it is impossible to cut them out. Oftentimes the removal of a few of the large ones will cause them all to disappear.

LIPOMA, OR FATTY TUMORS.—These are simply accumulations of fatty cells; sometimes they grow to an enormous size; they are liable to develop in any animal, and in any part. Vaginal Tumors are sometimes fatty Tumors. Fatty Tumors are easily removed—they are non-vascular; apply a little cocaine while operating.

NEUROMA.—This is a nerve Tumor, and about the only place this is seen is in following neurotomy, by not cutting off enough of the nerve, or rather not pulling it down and cutting off, then allowing the end to draw up into the limb as it should do. This is not common in the lower animals, but is more so in the human. As seen after neurotomy in the horse, it is very painful, intense and constant, and pressure on it makes the horse lame.

Treatment.—Give the horse chloroform, or inject cocaine and then remove the Tumor. You will often find that when the horse is not benefited by neurotomy, it is generally due to the forming of one of these Tumors.

CONDROMATIC OR ENCONDROMATIC.—Are cartilaginous Tumors developed commonly in two cases, one on the sternum of the horse or ox from external injury—as collisions, injuring the sternum, setting up inflammation, which is followed by this Tumor. Sometimes they develop in cattle from lying down on the sternum. In the horse we find them developing in and around the trachea, from tracheotomy, or from kicks from other horses, etc.

Treatment.—If they are limited in size they can be removed with the knife, but when very large that would be impracticable. External cartilaginous Tumors can be removed. In the early stage of these

Tumors you will find on cutting into them that they are largely fibrous; later, these fibres become changed into the cartilaginous.

OSTEOMA OR BONE TUMOR.—These are bone Tumors, no matter what the cause may be—as Splint, Spavin, etc.; they come from inflammation every time.

CYSTIC TUMORS.—These are very important, because we run on to them so often, as Capped Hock, Capped Knee, Wind Galls, etc. They may grow on any part of the body, inside or outside; they often contain hair, and are often lined with skin on the inside as well as on the outside. These Tumors, and especially Capped Hock, always come from injuries, usually from kicks, or injuries in a box stall; Capped Knee, from falling, or when on the side, from speedy cuts from the other foot; Capped Elbow, from lying on the foot or on a hard bare floor; this may occur in some cases in a single night, as big as your fist. These Cysts when produced so rapidly are always filled with serum. There is acute inflammation from twelve to forty hours, and it is during this inflammation that the serum is developed, and it is hot and sore.

Treatment.—For Cystic Tumors on the horse's legs, the first general principle you can maintain in the treatment, if they are a good size, I think, is to puncture them, no matter where they exist. In Capped Hock or Knee, it has been proven by experience they can be opened with safety, if you go about it carefully, and it is the only satisfactory treatment. Treat carefully after puncturing; often where other doctors have failed to effect a cure by other treatment, some of our graduates effected a cure by puncturing. If the Tumor is not tapped, in the course of time the serum will coagulate, organize and form fibrous Tumors, which must be removed with the knife; and in some places these would be unsafe to remove, so it is important to get them early.

Method of Operation.—Be careful of your diagnosis; find where the point of injury is—take the knee, which is caused by speedy cuts; these are made when the horse is tired after long driving, as the speed is continued and the horse struggles, the point of striking is changed, and he may pound over a large surface. Locate by the amount of fluctuation, then open with a probe-pointed bistoury, never a scalpel, as near the bottom as you can get; put on twitch, have assistant lift opposite foot, catch your knife, leaving about an inch to cut with, cutting point up; insert slowly at the bottom, inward, upward, and outward, till the point of the knife is about an inch from the insertion, then cut through; sometimes you will not cut deep enough, then the serum will not flow, then cut deeper. If you cut off any veins don't be alarmed, but stop the bleeding. After cutting the Tumor, syringe out with a caustic solution that will cauterize the sack enough to prevent reforming—as tinct. iodine full strength, a couple of drachms or more. After this treatment there will be a little discharge for some time, so we usually dip a wad of oakum in antiseptic and insert in the opening. Bathe an hour at a time with hot water; take out oakum while bathing and afterward insert a new piece. Never syringe after the first time; put on a big poultice sterilized with hot water and strongly carbolized; keep up for ten to twenty days, by that time the cavity will be filled up and the opening healed, and you will have usually a hard Tumor left, of inflammation; now bathe and use anodynes, as witch hazel and soap, equal parts, and

the other half water; use this freely and wrap with flannel, give a little walking exercise. The inflammation will gradually subside, and the animal will be all right soon—in about six to eight weeks.

If an old case is brought to you, open and make a new wound of it, poultice, and after about a month put on mild blister—as cantharides, once a month. In treating these cases, if after three months a thickness is left, hand rubbing will benefit very much. Hock can be treated in the same way, but in tapping the Capped Hock the incision is made behind. Remember the anatomy of the part, and you can cut without any danger. For old chronic cases you can't do much good; may try iodide merc., one to eight of lard, fly blister, one to three of lard, mix these two in equal parts and apply. In the elbow, you can make a good liberal opening and keep the horse standing afterwards from one to three weeks; don't allow to lie down, as that may have been the cause in the first place. Give a little walking exercise to relieve the standing; if a bad case, bathe three or four times a day freely, and wash out. If the Tumor on the elbow becomes fibrous and the owner wants it removed, you can do so; make an incision through the center and dissect it out in two parts. After you get this kind of a case well, find out the cause, if possible, and remove or remedy.

SEROUS CYSTS ON KNEES OF CATTLE.—If just begun, open and treat as any other Tumor. If chronic, Veterinarian cannot afford to touch it. Only thing to do in chronic case, is to cut elliptical piece out of Tumor. Build manger that suits purpose.

CYSTS.—Where they form in other parts of the body from kicks and other injuries, can be opened freely at the bottom; you may inject, but not enough to cauterize. Use hot applications an hour at a time three times a day, and regulate diet; may give a laxative. In Capped Elbow, where the Tumor is small and bagging, some remove them by ligating; tie a cord around it tightly, and in three or four days tie another one and much tighter; after three or four days cut off and sear with hot iron, and then treat as a simple wound. The trouble with this way of removing them is, that there is a considerable amount of inflammation. Only in the case I mention would I use this means; I prefer the knife in all cases. Prof. Williams punctures with hot iron, and then eats them out with corrosive sublimate or arsenic inserted; this is a timid way of treating. After operating give a little walking exercise, but don't work for some time.

OVARIAN CYST.—This is very common in all females—women, cows and cats, particularly; not so common in mares or bitches. It is a dropical condition of the ovary, or part of it, as the Cyst may not involve the whole of the ovary, part being left healthy. This is usually produced by, or produces, a subacute inflammation of the ovary, and more or less desire for the male, called Nymphomania. In large animals—as the cow and mare, you can recognize this by inserting the hand in the vagina, and if large you can find them easily; when the ovary is normal in size you cannot feel it in either the vagina or the anus; and in diseases it is lumpy and very elastic.

Treatment.—Sometimes these Cysts can be treated heroically by inserting one hand in the vagina and the other in the anus, and rupturing them by crushing them with your hand; the serum escapes into the

abdominal cavity and does no harm. Give soft feed and rest, and the animal will recover in a day or two.

MUCOUS CYSTS.—Are those that develop in the mucous membrane and fill with mucous instead of serum; they develop in the mouth; sometimes called *Ranula*; they develop in oblong tuberous forms. It is usually not necessary to dissect them carefully, but just slit them up full length, and wash out with alum or boracic acid.

CYSTS IN THE THYROID GLANDS.—These are *BRONCHOCELE* when they are filled with water, and *GOITRE* when they are solid. They are common in horses and cattle in limestone regions; certain sections of every country seem to be affected. The most noted place is Derbyshire, England, and the St. Lawrence valley in Canada.

Treatment.—Different kinds, with more or less success, usually less. If you think it is due to the part of the pasture, remove to some other part; and in fresh cases, paint them with iodine once a day, and give iodide potash internally. If the skin gets sore from the painting, cease for a time and oil them, then continue again. If you think there is serum, tap with trocar, if you are doubtful, use the hypodermic needle first. In such a case make the opening larger, but remember this is a dangerous place to cut, but the trocar is good; then inject one dram of iodine, and paint on the outside with the iodine—it may swell a little, but that will do no harm; sometimes when we tap them we find blood instead of serum, due to rupture of blood vessels. You can't dissect them out on account of the organs there; if it is an aneurism, you can't cure it, so close opening and let alone. If you find it growing and pressing on the œsophagus, trachea, or large arteries, you may dissect it out, but this has met with poor success in human, and the lower animals may die on the table; it is the last resort. I think the external applications are the only safe ones, or treatment, for this kind. *GOITRE* is more common in the stallion than in any other animal, and is often an eyesore.

Treatment.—Give mild purgative, diminish his feed, increase his exercise; give one dram iodide potash, night and morning, in his feed for a week or ten days; then repeat, but don't continue too long at a time, as it may affect his testicles and destroy sexual desires. Clip off the hair, and rub well in with friction, iodide potash in lard, 1 to 8, night and morning for six weeks.

CUTANEOUS CYST.—Is a Cyst in the skin; all that these require is to open as a *Ranula*.

COMPOUND CYSTS.—Are multiple Cysts, when two or more exist. These Cysts sometimes develop in the sinuses of the head, causing a bulging of the bones; in the submaxillary, often the whole length of the sinus. In that case you can trephine at both ends, and cut out the section of bone between. In addition to the bulging there may be a discharge from the nose, often streaked with blood and often mistaken for catarrh; but if it is, there will be no harm in the treatment. These Cysts sometimes, instead of bulging, bear downward, causing great trouble by *Dyspnoea*.

TEETH-BEARING CYSTS OR TUMORS.—Called *Dentigerous*. Tumor teeth may be found most anywhere; most common place is at the base of the ear, sometimes seen in the maxillary sinuses, or frontal sinus, or in the testicles or ovaries. When they develop at the base of the ear, there

will be a little swelling there, then it may start to grow suddenly, and cause pain and trouble; sometimes will rupture. When you cut you will find a molar tooth there, which seems to grow without a matrix. When in the testicles, they don't seem to cause any bother. When dissecting at the ear, be careful of the organs there; but as they are generally between these organs and the skin, there is little danger.

OSTEOSARCOMA.—As recognized by the old authors. In these Cysts the solid portions of the bone were invaded, destroying it, mostly in the cancellated bone tissue, causing it to swell and form open framework, and the spaces are filled with a grayish white matter, often vascular or bloody, and often hot and painful; loosens the molar teeth, the surface of it softens in spots, skin ruptures, and the discharge is of a purulent and gelatinous consistency.

Post Mortem.—Cutting through the Tumor, the bone seems to be disorganized; seems to be a Colloid Tumor of soft tissue. Gangee says it is a fibro-plastic degeneration of bone; Williams, that it is Tuberculosis; McEchran, that it is cancerous. Actinomycosis, Dr. Baker says, is what the above (Osteosarcoma) has been proven to be, beyond a doubt, here in Illinois, and that it is infectuous and can be transmitted from one animal to another, no matter where its origin may have been. This is Lumpy Jaw.

Treatment.—It is well to recognize it early and remove all the diseased bone, even taking a little of the healthy bone with it; make a simple wound of it, and treat as such.

Treatment of Large Tumors.—These should be taken out in sections and in quarters, and for this purpose the male and female needles should be used; then after removing, sear or cauterize with hot iron, lunar caustic, nitric acid, etc.

CASTRATION.—Technically known as orchidotomy or orchotomy. This is the operation of removing the testicles of the male; it is done as a rule to render him more docile, tractable, and useful, that is, as it applies to the horse. As it applies to flesh-producing animals, it improves the quality of the meat, fattens more rapidly, grows larger, that is, in cattle, also sheep and hogs. Horses may grow taller, but as a rule do not grow heavier; it makes the males of all animals lighter in the forward part. By being castrated young, the male grows heavier in the front and lighter behind, as the buffalo for instance. Mares grow more even front and back, and males when cut grow more like the mare. There are different names applied to the different males when they are castrated—stallion is called a gelding; to geld a colt, means to castrate him; bulls, as steers or oxen; a ram is called a wether; a boar is called a barrow; cocks are called capons, and a human, a eunuch. Emasculation is a term sometimes used to denote castration; this word means, to deprive of aggressiveness. In speaking of castrating a rooster, it is called caponizing him.

Age At Which It Should Be Done.—In the lower animals, as a rule, the younger it is done the better; it is invariably so in all cases except with the horse, for various reasons—the growth will be larger and more uninterrupted, and the feeling less. In the horse, the longer the colt is left an entire male, the heavier will be the crest and shoulders, and the lighter the behind. If castrated young he will be heavier behind and lighter in front, so the time should be regulated as to how we want the

animal to grow; colts as a rule are castrated at about one year old; many prefer at six or nine months old. Thoroughbreds have a tendency to grow lighter in front, even to grow U shaped in the neck, so it is best to leave until two years old before castrating. In blooded animals it is best to cut them early, as the age applies to the horse; it depends also on the tendency of the animal as to how it grows; the older a stallion is before being cut, the bolder he grows; I think many of these would be better if left till four years old, to prevent the U shaped appearance. If an animal is left to be an adult before being cut, he has acquired all the characteristics of the entire male, and then he is known as a stag; this applies in horses and cattle, and may be to other animals, but is well marked in horses and cattle. By the well-developed head, neck and shoulders, and short head, and light behind, you can make up your mind when you see an animal that is castrated, and with these characteristics, that he was an adult when cut.

Best Season to Castrate.—It can be done at any time, provided you have a proper place to keep them, but we prefer to choose mild weather; avoid extremes as to heat and cold, and also to fly time.

Preparations.—It is well always, especially if the colt has been fed on grain, to diet him, or best to fast him for twenty-four hours, on general principles.

Restraint.—Every castrator has his own pet way of confining the animal for this; it doesn't matter how it is done, so it works well. It is considered a simple operation nowadays, and it really is a simple one, but must be properly done, or serious troubles and death may result. The old side line is used much, as it is simple and works well. The question as to do it standing or to cast, I don't know if there is any choice, but if there is, it must be in favor of casting, because the colt may behave unexpectedly bad, may cut up, then you are unable to finish the operation, unless you cast, which makes the operation dangerous. Another reason is, there is less danger, or no danger, to the operator; another reason is, when you get the scrotum cut and the testicle out, the animal may kick, etc.; you may pull down the cord too hard, and from this a malignant inflammation may set in, which may cause death. If you operate standing, put on a neck strap and tie up tightly. When they are first cut or feel the knife they sometimes kick, but generally are surprised and squat down, then remain quiet; but be sure to have plenty of room, so in case he cuts up you will have room to save yourself injury. If you lay colts down it is perfectly safe; in old horses, over five years, there is very likely to be an Anchylosis of the lumbar vertebrae, and this becomes fractured when cast, and if so, presses on the cord and causes paralysis of the hind parts, and the animal never gets up; so when you go to cast an old stallion, always warn the owner as to what may happen.

Methods.—There are various methods in all countries, of castrating; the ones most common nowadays are, clamp, torsion, ligature, actual cautery, scraping, and the ecraseur. Before you cast the animal you want to examine to see if there is any rupture of the inguinal, and whether he has any testicles down in the scrotum; if he has one, he is called monorchid; if he has none, a cryptorchid. Then lay down, suppose two testicles down, no Hernia; best to lay on his back, though some lay on the side. Wash the scrotum with hot water and soap, and have

hands and instruments thoroughly clean; locate yourself behind the colt, catch the testicles up, then cut through the skin dartos and tunica vaginalis; always make an opening at least three inches in length. After the testicle is out, insert your knife between the spermatic cord and tunica vaginalis and cut the epididymis. The hooked knife is much used in this operation, to let the testicle out; now put on the clamp from before, back, about two inches below the testicle; fasten the clamp, and then cut off the testicle about a quarter of an inch from the clamp. These clamps are left on a variable length of time—from twenty-four hours to three days; others think they should slough off; it is simply to prevent hemorrhage; twenty-four to thirty hours might do all right, but for fear of secondary hemorrhage, best to leave on for two days, or to the second day, then push up the cord.

Torsion.—You want two pairs of forceps, the ones used in human practice do very well; catch the cord with the forceps and fasten them, then take another pair, catch hold about an inch from the first clamp and twist off the testicles.

Ligature.—This is applied either to the cord entire or not entire. Put on temporary clamp, cut off the testicle, pick up the artery and ligate; it is the spermatic artery which is very long and in convolutions, and you may cut off a number of branches, so you will have to pull these out till you get the main artery and ligate it, as the others are only cut-off sections.

Cautery.—Take the cord in the temporary clamp, cut off the testicle and cauterize the end of the cord with the red-hot iron;—this is a popular English way. That is sufficient in young animals, or rather colts, but in old, in addition to this cautery of the cord, Prof. McEchran used to locate the artery and ligate.

Scraping.—Take out the testicle and scrape with the knife instead of cutting; this is the method used in most small animals—sheep, dogs, cats, pigs, etc.

Ecraseur.—The word means a crusher; the French originated this method and instrument. Place the chain around the cord and cut off slowly by crushing it; there is less danger of hemorrhage when cut off slowly, than when done quickly.

There is another method that is used in Russia, that seems to us barbarous; they lay the testicle on a board and pound it with a wooden mallet, believing this leaves the animal with more of its aggressiveness. As to choice of methods, the question of hemorrhage is the main point; the clamp is good, but it has the fault of crushing the nerve, which is very sensitive in this region; this causes intense pain, often accompanied with rolling, and kicking, and colicky pains. In many cases the ligature would do the same, unless the temporary clamp was used, and only the artery ligated. Another fault with the clamp is, that it holds the cord down, and when the clamp is removed the cord will often hang down an inch out of the scrotum, and this may take up germen—especially the Botryo Mycosis; this produces Scirrhus of the Cord; it may grow to the lips of the wound, and an abscess form in the scrotum, poisoning the blood often, and inducing inflammation of the chord also.

Torsion is applied to small animals; the objection to this is that it

leaves a ragged end on the cord, and more sloughing. Ligature, when applied to the artery alone, is the most surgical way.

Cautery is very effectual, but there is always trouble in getting irons heated, etc., and then sloughing afterwards; but that doesn't hurt any.

Ecraseur is the most popular way in this country, and as a rule is quite effectual; by crushing the artery it allows the blood to clot.

After Treatment.—We look upon this as being important in one particular—it keeps the opening open, as it is liable to heal by first intention. The proper way to do, is to dip the finger into fresh lard, then insert into the opening; germs won't grow in lard, and as it is an antiseptic, with lard on the edges union will not take place. After removal of the clamp, push up the cord and hold there for a little while to allow it to contract. Confinement of the pus in the scrotum is often a cause of Peritonitis, that is, when there is a union with the lips of the wound; Septicæmia often follows. Give colt plenty of exercise; of course, there will be some swelling and local inflammation, but you can remove these by exercise; give soft food. A work horse can be castrated and go to work at once, but it doesn't seem humane to do so—they ought to have a few days' rest and plenty of exercise. If the scrotum swells much, it is due to the lack of exercise; if it is due to Septicæmia, it will be hard and hot—then bathe with hot water, introducing your sponge into the wound; afterwards use antiseptics; that is, into the inguinal canal—as carbolic acid.

Mortality.—Some deaths will occur, and there will be more some seasons than others; can't say why this is. In France and Germany, castration is all done by the government Veterinarians, because the studs are all under the control of the government; there the mortality some seasons is as high as thirty-three and one third per cent, other seasons five per cent, and the average about ten per cent. I don't think the mortality in this country is anywhere near so high.

Cause of Death.—First, secondary hemorrhage; second, blood poisoning—Septicæmia; third, Hernia; fourth, Tetanus, and in addition to these we have Fistula of the Scrotum, Gangrene of the Cord, and Scirrhus of the Cord.

SECOND HEMORRHAGE.—Is that which occurs some little time after the operation, say in the course of fifteen to thirty minutes; it begins then and increases; this usually occurs in colts in a poor unthrifty condition, and where there is a lack of fibrin in the blood, and will not coagulate well or quickly. You may be called to treat a case that some other person had castrated; the first thing you should do is to try the administration of ergot; the fluid extract of ergot one ounce. Then in fifteen minutes if the hemorrhage does not stop, give another dose; if this fails, don't give any more ergot, but try to catch the cord of the one that is bleeding, or both, if they are both bleeding; if you can find it, then ligate. That is the one advantage with the clamp—this never occurs; with the *ecraseur* it might. If death does not occur, it may run on till it causes a separation of the retina from the choroid membrane of the eye, and cause partial blindness, which may remain through life; this is from the blood getting so thin, and new blood forming, it is so thin sometimes as to ooze out of the vessels into the surrounding tissues. This trouble which is produced is known as GLASS EYE, and the eye appears healthy and full,

but is insensible to light, which is a case you should always look out for in examining for soundness; the pupil is always dilated in this condition. Sometimes from castrating by other means than the clamp, the cord is drawn up into the belly and internal hemorrhage takes place, no blood being seen on the outside, and the colt may bleed to death; in this case use ergot, and you may dash cold water on the stern.

SEPTICÆMIA.—We avoid this first, by adopting cleanliness; second, by refraining from operating when the animal is sick with Strangles or Influenza; it is almost certain to kill him if we do. If you do operate on one of these animals, be sure to wash your hands antiseptically before operating on another colt, or you may infect him. Suppose Septicæmia does occur; the symptoms will be quite extensive, swelling of the scrotum, it will be hot and painful, and will pit on pressure; temperature increased, may be 104 and 5 or 6; loss of appetite, rapid emaciation, and may die in five or six days, or may run on for five or six weeks; if it runs on that long, there will be Marasmus.

Treatment.—Hot fomentations; you may rely almost entirely on these, and keep up almost continually, getting it up into the inguinal canal; also use antiseptics with it, as external—tinct. of iron, quinine; alcoholic stimulants in generous quantity. The tinct. of iron acts on the red-blood corpuscles, and it is these that Septicæmia destroys. Quinine is indicated in all cases of Septicæmia; a little gentian may be added to it.

PERITONITIS.—This usually comes from the inflammation extending up the cord into the abdominal cavity, and affects the peritoneum. Symptoms are the same as in any other Peritonitis, only they roll less and kick less, and when they die with it, are usually quiet, often wont move a bit, except may pick up foot and let down again.

Post-Mortem.—Same as the ordinary; it is due to a germ. After the inflammation extends up into the belly it is nearly always fatal. If you are notified before it extends up far, you may be able to give relief; give hyposulphite soda along with opium and whisky.

HERNIA.—This may occur during operation, by the colt taking on an involuntary straining, and will force the bowels out into the inguinal canal, or it may take place after he gets up, especially with the clamp. Sometimes only the omentum passes down, when it is called Epiplocele, when all down, Enterocèle. The Hernia must be reduced; give anæsthetic, 1 oz. or $\frac{1}{2}$ oz. chloral hydrate, or 2 ozs. sulph. ether, or 1 oz. chloroform. After you get the Hernia reduced, pick up the tunica vaginalis and cord, if you can, catch with clamp and give a turn upon itself, then insert a wad of absorbent cotton or clean towel into the inguinal canal, and sew up. Stand colt high behind, feed on bran slop, no hay; next day, cut open the suture and remove the cotton, then the swelling will be sufficient to prevent further Hernia. In case the bowels come out in large quantities, the proper thing to do is to tie up, with a sheet held over the loins till you can lay the animal.

TETANUS.—This doesn't differ from any other; caused alike from the germ, and is infectious, but not from animal to animal. These germs are numerous in the horse dung. Treat the same as any other case of Septicæmia; give a little morphia hypodermically.

FISTULA OF THE SCROTUM.—This occurs from the introduction into the scrotum of some foreign body, but usually from the lips growing to

the lips of the wound; abscesses are formed, and there may be a chronic discharge.

Treatment.—First, enlarge your opening with a probe-pointed bistoury, explore if there is any foreign body there; if you find a rose-like enlargement, pinch it off. Inject into this Fistula a strong solution of sulph. copper 1 oz. to a pint of water, about twice a week. In some cases you will have to lay down and remove part of the cord same as in Scirrhus of the Cord.

GANGRENE OF THE CORD.—Is incurable, as it is never discovered until it is too late.

SCIRRHUS CORD (Champignon).—Is a Tumor growing on end of cord, following Castration. Billings says it is invariably due to Botryo Mycosis. This is a fungus growth following Castration, unquestionably due to a germ in most cases; but I am not prepared to say it is always this particular germ. It is a dumb-bell shaped worm that gets into the wound after the operation, either from dirty hands, or from the soil, or in different ways. It would be strange if this did not occur in many cases, on account of the great number of germs, and this is one of the worst places, because the wound leads direct to the peritoneal membrane in the abdominal cavity. Some authors describe it as a fibro-vascular fungus enlargement. It follows the clamp generally, because it holds the cord down, and when the clamp is removed the cord is not pushed up as it should be, and from the dirty hand that may touch it. This Scirrhus Cord sometimes grows to a great size; Dr. Baker exhibited one taken from a 11-year old horse, that weighed twenty-eight pounds, supposed to have been in existence since the animal, as a colt, was castrated. Usually it grows to the size of a man's fist, or double that. In the early stage the horse will be stiff, sometimes very stiff and lame; sometimes only one side is affected. When very acute, it produces constitutional disturbances; there will be fever, puffed-up flanks, arched back. This is sometimes so extensive as to extend up the cord to the loins. This cord has been found to be as large as a man's arm up to the loins, and with abscesses; this leads to blood poisoning, emaciation takes place rapidly, fever keeps up, animal gets weak, Marasmus sets in, then collapse and death. Usually a Veterinary will be asked to find out what is the matter with the colt; this may be many weeks after the operation of Castration has been performed. The wound in the scrotum will be healed up nicely, and when you feel up the inguinal ring you will find an enlargement, which presses on the parts and gives great pain.

Treatment.—Removal with the knife is the only treatment; to do this successfully and properly, lay down and confine the same as for Castration; turn him on his back, lay open the scrotum over the Tumor, about the same place you would cut to castrate. It is not necessary to take off more than the large part of it; the neck may be absorbed, or it may grow again. You will find it is very vascular and will bleed very much with every cut of the knife, so go about it carefully; the veins are much enlarged, and if cut will bleed a stream, so be prepared to tie up if necessary. Skin back and lacerate the attachment, not with the knife, but with your finger; this will expose the cord. If it is small you can cut it off with the ecraseur; if very large, you will have to take off in sections; insert your knife perpendicularly, then put the chain around

and cut off the section, and repeat till you cut it all off. Hurry the operation on account of the hemorrhage; hot water is good, with a big sponge, temperature of the water about 175. Just as soon as you get the Tumor removed, put in the sponge and sew up and leave for twenty-four hours, or hold for a time and then take out the sponge and pack with oakum or absorbent cotton for twenty-four hours, then take out and cauterize with chlor. mercury 1 in 100, or tinct. of iodine; then treat the same as a simple wound; give clean bedding and tie up the tail. Some use a clamp for this purpose, then they have them curved, but I don't think the clamp is good in this case—the ecraseur is the best. Sometimes a Veterinarian will make more by not castrating at all, but let others do it and he will be called upon to treat bad results. He will have patients that others castrated for fifty cents or a dollar, that may pay him ten or fifteen dollars, for Tumors will often develop, no matter how well the operation is performed. The best preventive is to follow the after treatment given, and the use of lard, or you may use an antiseptic lotion.

IRREGULARITIES FOUND IN COLTS.—First, Inguinal Scrotal Hernia at the time of operating, first see if this exists. Make up your mind as to the mode you are going to follow, lay the colt down, turn him on his back and reduce the Hernia by manipulation on the outside; for larger ones insert your hand into the anus to assist you.

Covered Operation.—Make an incision through the skin and dartos, then you come to the tunica vaginalis that you don't cut, so dissect away the cellular tissue, letting the testicle out and the tunica vaginalis will come out also; put on your clamp, enclosing also the tunica vaginalis, put the clamp on extra tight and closer to the body than usual, then cut off the testicle as if the tunica vaginalis was not enclosed. If only one side is affected, operate on the side that is affected first, then on the other in the usual way. The great danger is when you let him up; if he strains, give anæsthetic; then feed on soft light diet. If the animal is affected with Hernia before you operate, have him fasted; after the operation have him stand high behind in stall for about three days, then the swelling will prevent any further Hernia. If the Hernia is unusually large, as in hogs, this method alone will not be sufficient, so when you let the tunica vaginalis out with the testicle, give it a turn upon itself, then put on the clamp. In the case of hogs, have your assistant hold them up by the hind legs—that will move the bowels forward. Sometimes we just cut out in the regular way, then pack with absorbent cotton and leave in about three days till it swells enough to prevent further trouble.

SPAYING THE FEMALE.—Spaying, technically, is Ovariectomy—removal of the ovaries. All kinds of females, especially in the lower animals, that are not wanted for breeding purposes are better off spayed, especially meat-producing animals—as cattle; they grow fatter, and faster, and better, and the younger it is done the better. In the case of bitches, it makes them more docile, and as for house dogs, they stay at home better and do not have company running through the kitchen after them, or linked together. As a rule, women are only spayed as the result of some disease of the ovaries, and are often spayed when they are virgins. It is no more uncommon to find spayed women than castrated men, but there is one peculiar difference between the human and lower animals; in the lower animals, when spayed, they lose all sexual desire, while a

woman spayed still enjoys the embraces of the male. Old bitches that have been bred before spaying may from habit take the male when her time of heat should come. The lower animals will only take the male during heat, while in woman it is different. It is thought that spayed bitches get fatter and lazy, but I think it is due to their old age, and that a young bitch will not get any fatter, but may when she gets older. But they get brighter and more docile, and some hunters say they are better, and their scent just as good.

Preparation.—It depends on what kind of an animal you are going to operate on, but it is best to fast them all; if a bitch, fast forty-eight hours if she is fat; heifer, twenty-four hours will do. In the bitch the ovary lies away forward near the diaphragm; in the cow it is near the broad ligament. Bitches are hung up by the hind legs on an inclined plane; be careful as to cleanliness, as you will have to come in contact with the peritoneum, otherwise it is a simple operation. You will have to educate the touch as well as the sight in finding the ovary in the bitch; best place to learn it is in the dissecting room. In bitches the horns of the uterus run away down to the diaphragm. In bitches we don't consider it well to make the incision at the umbilicus, but run up near to it and not very large; insert the finger and dilate down towards the spine; the ovary will be recognized by its firmness, and when you see, by its dense fibrous appearance. If fasted, the omentum will not bother you, but may if full. Usually you can pinch off the ovary, or else cut off with scissors. Heifers are usually spayed through the median line, either on the right or left side; make an incision large enough to insert the hand. If on the left side, you go posterior to the rumen; on the right side, you don't go near the rumen. Cows may be spayed through the vagina.

After Treatment in Spaying.—Neither the vagina nor the flank requires any particular attention; when in the flank, it is usually sewed up and the animal turned out, and no further notice taken of her. The wound in the vagina requires no further treatment, not even sewing up. The sow is operated on through the flank or median line; they are usually laid on an inclined plane with the head downward, and operated upon the same as you do on bitches. If you operate through the flank, either side will do—whichever is the handiest to you. The peculiarity in the bitch is the ovary lying so far forward. The after treatment does not amount to anything, except to give soft feed. In bitches we usually take pains to keep clean, and give soft feed. With other animals, it is painful for a little time. If the fever should run high, give a little quinine and iodide potash. As to the right age, the same rule as in colts will apply—the younger the better; there will be less danger of Hernia and less feeling. It is difficult to spay a bitch before she is six months old.

Females should not be spayed during pregnancy or heat: during pregnancy the shock might cause an abortion, and in heat the blood vessels are so enlarged there is danger of great hemorrhage. If possible, the spaying should be done before the first heat, then the blood vessels never have been enlarged, no congestion. If there should be any great hemorrhage, give them the fl. ext. ergot internally; for a bitch weighing about 25 pounds, give 1 dr. and repeat in fifteen minutes if necessary. Occasionally abscesses will form in the cavity; this seems more likely to

occur in cows than in other females. Cows can be operated on through the vagina; in doing this you will require a distender (repeller), and then insert the knife and cut upwards through the wall, being careful not to cut the rectum.

CAPONIZING FOWLS.—For the same purpose as in other meat-producing animals, they make better meat, grow faster and larger, and their meat is far better than that of the ordinary fowl, and they bring a better price and are much sought for. They are handled to the best advantage by laying them on a barrel and tying a brick to the legs and let hang down, then another one to the wings—that holds them in position. Locate the last rib in the flank; if there are any feathers there remove them; cut down through the costal muscles between the last two ribs, then with spreaders part the ribs and hold them apart. When the ribs are parted, you will find the ovary close up to the back near the kidney; you will see a small white body usually from $\frac{3}{8}$ to $\frac{1}{2}$ inch in size, this is the testicle; catch hold of it with your instrument and twist off, then through the same opening go in and get the other one, and take this out the same way.

The mortality is very small.

RIDGELINGS.—Such horses, although the testicles are not in sight, are entire males and they can get foals. They are just as aggressive, vicious, and in all respects like the ordinary stallion, except the testicles being out of sight. Their testicles are usually not so large as in the ordinary. We had a bull with but one testicle down, and he was just as reliable, and did not have one like himself. Ridgeling stallions are objectionable as foal getters, because they are liable to produce ridgeling colts, for it is a law in nature that like begets like. It seems that stallions get more ridgelings than any other animal, or rather some stallions. There seems to be a faulty development, and it is a sort of deformity. The cause of being a ridgeling seems to be that the testicle is too light to descend into the scrotum; they are usually found in the belly near the abdominal ring, may be half way through the ring or entirely through, or they may not descend at all, and be found near the kidneys. When it stops just inside the belly, he is called a true ridgeling; when half way through the ring, the animal is called a high flanker, when it is low down in the inguinal canal, he is called a low flanker. Always examine to see that the colt has not been castrated before, when you are asked to operate on these, as sometimes some castrator may have tried it and did not get both out, so if you cannot learn from the owner for certain which one was left in, then you will only have to try both sides. Sometimes you can locate the side by feeling in the rectum. If it is a stallion with only one testicle down, then it is always advisable to operate on the hidden one first.

Preparation.—I was always led to believe that it was proper to diet for twenty-four hours before in the horse; for some reasons it would be best on general principles. Some castrators say it is an advantage to have the viscera full, as you have to go inside the belly, and when they are full they are in their positions and you can find the testicle more readily and get it out better, than if he was fasted. In opening up the ridgeling, proceed the same as in the ordinary stallions, but you must spread his feet and hind legs well apart, flex the hocks, and get well down on the hips to have the flank exposed. When you get him tied, then turn on

his back. Farmer Miles does not care how he has him, but usually lays him on his side and makes no fuss over the job, but still he sometimes loses some colts. You should study the anatomy of the parts well in the dissecting room, for you will never make a good operator till you know the parts thoroughly. When you are ready, catch hold of the scrotum and pull forward, make your incision downwards and backwards; make this incision where you would to castrate the ordinary the colt; good plan to have carbolized oil handy, dip your hand in the oil and then worm the fingers through the inguinal canal into and through the ring; usually you will find a little testicle there, then break down the tissues and draw down and use either the ecraseur or the emasculator having the corrugated side of the emasculator next the body. This is sometimes better than the ecraseur, as you can't always get the testicle clear out, and you can reach in with the emasculator. Suppose the testicle is in the belly, you go in the ring, and if you don't find it, go through the ring, some will pass their finger through the peritoneum; others go through Poupart's ligament. Ninety-nine times out of a hundred it will be found on the floor of the belly posterior to the ring. You can recognize it by the feel—nothing else there feels like it except it might be dung, and you can tell even between that. Catch it between the fingers, bring out and remove. If you have made an opening push back the cord, which will adhere to the lips of the wound, and it will heal all right.

After Treatment.—Much the same as in the other cases, but be more careful, give exercise, and use hot fomentations if there is much swelling; of course there is more danger of Peritonitis, as you come in direct contact with the peritoneum. The preference, I think, in these cases is to make fresh opening rather than enlarging the ring, and if you do go through the ring, make as small an opening as possible. Following this operation, Hernia will sometimes occur in the best of operations, when the colt gets up the bowels come out; use same treatment as in the other cases. Other than horses are liable to be ridgelings—as the bull, boar, etc. Bull and boar are usually castrated through the flank, same as we spay the bitch instead of through the inguinal canal; the horse could be done the same way, but the peritoneum in the horse seems more liable to bad effects than in other animals. We spay all animals but the mare; I never saw a case of the mare getting over the operation, while all other animals take it very mildly; that is why it is dangerous to castrate the ridgeling through the peritoneum.

DISEASES OF THE LIVER.—These are rare compared to the human, and are rare also as compared to diseases of other organs of the lower animals, but the liver does become diseased sometimes in a well-marked way. When it does occur it is always serious. The phenomena of diseases of the liver are few, the principal one being the yellowness of the visible mucous membrane and white skin; sometimes there is lameness of the right fore quarter, all on account of disease of the liver. There are sometimes colicky pains, and the liver is sometimes excessively active and increases a great deal of bile, which often causes Bile Diarrhœa; this is seen by the unnatural yellowness of the fæces, and deficiency of bile causes a gray fæcal matter and an excess of gray mucous matter.

CONGESTION OF THE LIVER.—This is simply an engorgement of the glands with blood; it is seen in two forms—Active and Passive.

ACTIVE CONGESTION.—Is due to overfeeding on stimulating food, or on highly concentrated food, and the exciting cause is the want of exercise. It is more likely to occur in hot weather than in the cold. In this Congestion the hepatic circulation is involved, the hepatic arteries and capillaries, but more particularly the arteries. There is simply an increased flow of blood. Active Congestion, *to a certain extent*, is always present during digestion, but this Congestion is harmless. Active Congestion as a rule is always serious, more so than the Passive.

PASSIVE CONGESTION.—Occurs in the portal vein, and is due to obstruction of some sort, or a faulty propelling power. We find that with Passive Congestion we frequently have valvular insufficiency of the heart; there are other causes also. We get it from Hepatization of the Lungs, due to faulty circulation of the blood through the heart. Emphysema also tends to produce it; in such a case, there is not the usual quantity of blood sent to the lungs, circulation is obstructed, and this causes, in a reflex way, Passive Congestion and of the portal system. As a result of this we get two kinds of Congestion, and sometimes a third, which arises from a form of biliary duct which becomes surcharged with biliary matter. These congestions, and we speak of them usually together, either or both will cause the third or Biliary, and if they last very long we get biliary poisoning of the blood as a result; also may be done by serious Inflammation of the Liver; or Abdominal Ascites may result.

POST-MORTEM.—The liver shows an enlarged organ with patches of dark streaks showing also brown, and with lighter ones here and there, giving to the organ a mottled appearance. This kind of liver corresponds to the Nutmeg Liver of the human. The dark patches in this case are the enlarged hepatic veins, the lighter ones correspond to the ramifications of the portal; the lighter patches where the portal is concerned, the liver is anæmic. The passage of the portal vein is obstructed and the hepatic enlarged, and being congested produces the dark streaks. The brown is probably due to pressure, or may be due to fat cells in the cell structure—fat in the hepatic lobula. The pressure, other than the fat, is on account of the increase in the interlobular connective tissue.

ETIOLOGY.—The most common cause is previous pulmonary or cardiac diseases; sudden chills from exposure to storms while in a heated condition will often cause severe chill, which will result in Congestion of the Liver. An animal suffering from Influenza often has Congestion of the Liver, that is probably due to weak circulation during Influenza. In Influenza we see the yellow color spoken of. Errors in diet, particularly over-feeding, and particularly in hot weather; faulty digestion is often the cause or accompanies it; sudden overexertion especially in hot weather when not in a condition to accept such, and also strong exercise after eating.

SEMEIOLOGY.—The symptoms are not very diagnostic, as many of them are common to other diseases. The most prominent feature is dullness, listlessness, languor—this is liable to be the case in over-fat animals, as the result of Congestion of the Liver. In sudden severe attacks there will be colicky pains, not severe but quite well-marked; will look around to his right side instead of to his left; pressure over the region of the liver will cause pain. After this has been running on about twenty-four hours,

the yellow color of the mucous membrane will be noticed, urine will be brown, fæces gray in the course of three or four days, and very offensive in smell. If this condition is continued three or four days the animal will grind his teeth, his mouth is soapy to the feel, and offensive smell; he licks the wall as though hungry for lime salts, has an unnatural appetite, seems to want alkalies and will eat clay; this is especially so where they are kept long on hay or grain. In severe cases there will be lameness of the shoulder; sometimes it is associated with Influenza, possibly with some other infectuous disease, as Purpura Hemorrhagica and Valvular Disease of the Heart. Sometimes the appetite is completely lost, but usually is not interfered with very much. Usually it runs a benign course, and may only exist for a number of hours; but sometimes you get rupture of the capsules, which will result in a fatal hemorrhage.

Treatment.—Considering that the whole trouble is hyperæmic in Active Congestion, blood letting would be the most sensible treatment, and would be indicated; but if it is Passive Congestion and due to obstruction of the portal vein, it would do no good to bleed. But we don't bleed now even when good, but instead give a purgative, as magnesia $\frac{3}{4}$ pound. In case of Passive Congestion there can't be very much done for it, because you cannot remove the cause; but if it is caused by lung trouble, try to remove that; if valvular of the heart, treat with stimulants—as digitalis. But the trouble is, that Passive Congestion is not known to us, or we are not called until Ascites has taken place, and then there is an anæmic condition of the system. Iron is indicated; digitalis for the heart, and good diet. The great trouble is that Passive Congestion has become chronic before it is brought to our attention. In case of Active Congestion, reduce his feed and increase his work, thereby reducing the cause. In addition to the purgative, if you think it necessary, give a diuretic, and after either one of the Congestions produces the third give mineral acids internally after the purgative—either hydrochloric and nitric mixed, or sulphuric acid; I prefer the sulphuric. In this kind of case their appetite is weak; we usually give acid tonic as—tinct. gentian 4 ozs. sulphuric acid 1 dr., aqua ad. to make one pint. Dose, 1 oz. three times a day, that is a dose for a driver about 1000 lbs.; to a horse that weighs more, you can give 2 ozs. This trouble is seen more in the draft and heavy horse than in the driver.

HEPATITIS.—Inflammation of the Liver. This occurs in two forms—Acute and Chronic. In some cases it locates itself in the capsule, having extended to it from some adjacent tissue. We find it in severe cases of Pleurisy, especially the Pleurisy that occurs as a complication in Influenza; it may also extend to it from Peritonitis. In most we find the capsule is immensely thickened, indurated, and enlarged, and evidences of extensive proliferation. In other cases the intimate gland structure suffers; in others, only the framework of the fibrous tissue is involved. Inflammation of the Liver can't be very well diagnosed during life, because it usually exists with some other complication, and sometimes abscesses form from this trouble. This inflammation of the liver is common in cattle, and the abscesses that often form vary in size from a walnut to turkey egg, particularly in old cows, and there may be from one to a dozen. The liver in old cows is invariably affected in some way.

Treatment—Can only be applied on general principles; if young and

strong, bleed; if old and weak, give stimulants and rational treatment.

CHRONIC HEPATITIS.—There are two kinds—Cirrhosis or Hardening and Fatty Degeneration, or softening; accompanying fatty is rupture, and usually fatal termination. Cirrhosis you can have in any gland; it means simply a hardening of the body as a result of the chronic inflammation. This is more common in the horse than acute, and there are many complications; as a result, there is a distinct granular condition of the tumefactive structures, and great increase of fibrous tissue in the covering and sheaths of the organ.

POST-MORTEM.—Feels hard and solid. There is a condensing inflammation of the fibrous structures; the edges are very much thickened, the fibres in the organ are increased and indurated, the hepatic lobula suffer from pressure; the portal vein is anæmic; surface of the liver is apt to be covered with little nodula; the obstructed portal vein prevents free exit of the blood from the abdominal viscera. The bowels and mesenteric suffer most, and, as a result, get Abdominal Dropsy and Ascites; in a bad case the organ will be covered with brown spots.

ETIOLOGY.—Usually find in horses that have been starved to death, hard worked on scanty feed, great exposure suffered, mostly seen in old animals. It is looked upon as due to faulty nutrition of the system.

SEMEIOLOGY.—There may be Ascites; horse may be pot-bellied, yellow mucous membrane, and anæmia or pallor, sometimes stupor; often mouth has a sour smell and soapy, long starring coat, oftentimes tender on pressure over the liver.

Treatment.—If it can be diagnosed early, remove the cause; often irregularity of the teeth will be a cause. If from lack of nutrition, give iron, nux vomica or gentian; if constipated, give sulphate soda in small doses, and improve the hygiene. Potassium bitartrate (cream tartar) 2 or 3 drachms to the dose, is good to remove the biliary congestion. The horse or animal may die, in Inflammation of the Liver, from Septicæmia also. Bring the feeding down to that of the ordinary animal, increase his exercise, reduce any artificial heat, give coarser and less of the nitrogenous food. In the sheep we find the cause generally just the opposite of that in the horse—they do not get enough nitrogenous food, and the liver develops a Fatty Degeneration, and so the treatment should be just the opposite of that prescribed for the horse. Give nitrogenous food, as bean-meal, $\frac{1}{2}$ pint once a day, with plenty of other food.

Occasionally we run onto two other kinds of inflammation—**AMYLOID** and **LARDACEOUS**. The causes are obscure, and they are seldom seen in the horse or any of the lower animals, though the Amyloid is sometimes seen in the horse; it is harder than the Fatty, and softer than the Cirrhosis; it resembles wax, but is a result of any of those degenerations, but more probably of the Cirrhosis. We get a general wasting of the body, Marasmus, collapse and death; while in the Fatty Degeneration they get fat, as in sheep; they may appear in the best of health a week before they show the effect of this. The horse gets yellowness of the mucous membrane, and if they die it is generally from hemorrhage. Dogs eating too much meat without exercise become affected; they must have exercise; it tends to the elimination of the nitrogenous through the production of urea.

JAUNDICE.—Sometimes called Yellows. This is a name given to a

yellowness of the whole system, due to one of two conditions: First, is non-secretion or suppression of bile, non-elimination. Second, re-absorption of the bile, taken back into the organ, and is poisonous. In the urine in these cases there are two acids—taurocholic and glycocholic acids, tested for in the urine in the following way: Take 1 dr. of the urine in test tube, and add a little cane sugar, very little, then pour 1 dr. sulphuric acid into the tube, slanting the tube and, pouring in very slowly to allow the acid to run to the bottom. If biliary acids are present in the urine, a deep, purple band will develop between the acid and the urine; if none are present, a brown band will form instead of the purple tint. The presence of the bile acids in the urine is a positive proof of re-absorption of the bile. In case of suppression there will be no acids. If there is obstruction there will be bile in the acids. In both cases you get blood poisoning and death. The suppression or non-elimination is due to the following causes: Enervation, this is probably the cause of most of it in the human; often seen in connection with other diseases. Disordered hepatic circulation; if this is interfered with, the secretion of bile will, of course, be interfered with. Then the absence of secreting substances, as seen in Atrophy, seen in interruption of the hepatic artery; also destruction of the liver as a secreting gland, or Tuberculosis, and several other degenerations. Then Jaundice from re-absorption is due to the following causes: Biliary Calculi, most common, and quite so in the human, not so much so in the lower animals, and is most prevalent among high livers. Second, inflammatory tumefaction of the duodenum, or lining of the duct that empties into it. The flow of bile is easily obstructed, and when it begins to stop, like the blood, it becomes thicker, so these calculi are generally accumulations of inspissated bile. Third, stricture or obliteration of the duct. Fourth, by tumors cutting in the duct, or at its mouth. Fifth, by pressure on the duct from without. Sixth, parasites—as *Strongylus Armatus* are often found.

SEMEIOLOGY.—General yellowness of all the parts, urine of a red-dish yellow, natural temperature, fæcal matter in the course of three or four days becomes gray, and continuing such passage we get either Diarrhœa or Constipation—more likely to get Constipation in these cases. In this urine you will see in the glass all the colors of the rainbow, if held to the light; mouth has a pasty, soapy feel, sour smell, sometimes loss of appetite; other times will not be. Where there is no fever the appetite usually remains good. Some people think this is so sure a sign that they need not take their temperature, but we know this is not so sure a thing. Oftentimes for three or four days there will be no derangement, but the animal is languid. When it has reached its height, in three or four days, they get a dry itching of the skin, which becomes scaly and glistening, and the more it is scratched the more it itches. In some cases there is lameness in the right shoulder; if not relieved, death follows from blood poisoning in a rather indefinite time—depends on the severity of the cause. If the liver does not secrete bile at all, it would not be very long until the animal would die.

TREATMENT.—Ascertain first if Jaundice is due to non-secretion or obstruction and re-absorption. If due to re-absorption, give oleaginous laxatives; they work mechanically, without stimulating the liver, and by

moving the bowels freely, have a tendency to carry off the obstruction. If it is due to non-secretion, stimulate the liver by giving saline laxatives; give a cholagogue—give aloes, calomel, podophyllin, sodium sulph., rhubarb, magnesium. We consider in moderate case best to give $\frac{1}{2}$ pint oil and $\frac{1}{2}$ dr. calomel; follow up with 4 ozs. sulphate soda in water, night and morning, for three or four days. If there is an over-secretion of bile it can often be regulated by tincture of iron internally, and quinine, in all cases rather liberally. Keep the animal quiet, give proper diet—if fat, give laxatives and coarser food; if thin and weak, give nutritious food. If Diarrhoea is present, give anti-acids to sweeten the bowels—as lime water, bicarbonate soda, prepared chalk, etc. Following the use of cholagogues, if they don't act properly, you can stimulate by hydrochloric and sulph. acid diluted properly—they are powerful, and care must be used. Ox-gall is an old-fashioned remedy, and a good one. Arom. spts. of ammonia is best stimulant to prevent nervous prostration.

GALL STONES—Are very peculiar; they usually begin to form by partial obstruction of the bile. They are accumulations of inspissated bile, and are most often found in cattle; also in sheep, but not found in the horse.

CACHEXIA AQUOSA, or WATER CACHEXIA of the sheep.—Due to the interference of the liver by the Liver Flukes, known as *Fasciola Hepatica*—Rot. We find that sheep having this were fattened on low, damp ground, almost wholly due to the lack of drainage; they usually get pot-bellied from Ascites, the liver swells and interferes with the portal circulation, Diarrhoea in the last stages, and dropsical swelling on the outside of the belly, or in the submaxillary space; difficulty in getting up when they lie down, wool gets dry and crisp and falls out.

Treatment—Should be prophylactic. Nothing can be given to destroy the Flukes that would not kill the sheep as well, so the only thing to do is to remove the sheep to higher ground. If that can't be done, then drain the low-land well. Chemicals and lime, salt and carbolic acid have been tried, but drainage did the only good.

PANCREAS AND SPLEEN.—Only have to say to deny the assertion of some authors calling Lymphadenoma of the spleen; this means a Tumor growing in a lymphatic gland, and the spleen is not a lymphatic gland; as described, it is a series of, or a lot of fibrous Tumors due to Chronic Inflammation. In addition to this we find the spleen is liable to many diseases—as Atrophy, Hypertrophy, Thrombosis, Cancer, Hydatides, Lymphadenoma, etc., also Ossification, Congestion, and Inflammation. Any or all these may form in almost any animal. Causes are obscure; the draft stallion seems most liable to it; I think it is due to long over-feeding. The use of the spleen is not known. It is a reservoir for blood, but if it is destroyed or badly affected the animal won't live long; and a stallion will get so he will not notice a mare. The spleen is also liable to Tuberculosis, Melanosis, and Chronic Inflammation, but they can't be diagnosed during life, or any of the other diseases, so treat on general principles—as stimulants, and out-door exercise.

PANCREAS.—Is still more obscure. Its function is to secrete pancreatic juice; seems to digest fats, but the dog suffers from affections of it, and where there is an absence of the pancreatic juice he will pass un-

digested bits of fat that were eaten, and there will be found sugar in the urine; this trouble in the dog often follows long feeding on liver.

DISEASES OF THE CIRCULATORY SYSTEM (HEART AND BLOOD VESSELS).

DISEASE OF THE HEART.—Is not common in the horse, but when it occurs it is very serious; this is so in the human as well as in the lower animals, and usually terminates fatally. When it comes it is always sudden; chronic may linger a long time, but when death comes it is sudden.

We examine for heart disease in three ways, much as in lung troubles—Inspection, Palpation, and Oscultation. By inspection we detect any change in the position, and the force of the beat can be often detected—you can see it in the jugular; and as to the character and rhythm, you get that by palpation to see if regular. The observation we get by oscultation is for sound; there is a characteristic sound when normal, that there may not be in disease. The phenomena of heart diseases are as follows: Languor, though not specific; Lassitude, impeded respiration during action or existence of disease; this often amounts to actual distressing Dyspnoea, as seen in most cases of heart disease during exercise. Unless you are posted on pathology you might easily mistake this for troubles of the lungs, when they are impaired with disease; there is Congestion in them. But the cause looked on as existing only in the heart, is defective cardiac power; this causes Passive Congestion of the lungs. These cases of chronic heart troubles caused by exercise are often perfectly well only when taking exercise.

Diseases of the heart are divided into two classes—Functional and Organic. The organic is sometimes known as structural. Functional diseases of the heart are three in number—Palpitation, Cyanosis, and Syncope. **PALPITATION OF THE HEART** is tumultuous action, due to the following causes: disturbance of the rhythmical action of the heart by any disease or trouble that upsets the equilibrium of the sympathetic nerve system; diseases of the lungs; changes in the quality and quantity of blood—seen when animals suffer from anæmia, which is a typical illustration. Influences causing Palpitation through the nerves are divided into three classes—Intrinsic, Centric, and Reflex. Hard work often brings it on, and especially on a hot day. **THUMPS** is a tumultuous action, seen when caused by exertion and the animal is exhausted—that taxes the heart more than any other thing; this is often produced by too much exercise, especially when the animal is not fit to take it.

Semeiology.—Increased force and frequency of the action of the heart; sometimes this is regular in this disturbance, but usually it is irregular, sometimes intermittent, and the beats sometimes come piling in on each other so fast that you cannot count them, then they drop below the normal number. Heart troubles are often caused by Indigestion. May get all the different irregularities of the beat in the course of two minutes; it may be continuous or paroxysmal; there is no actual pain, but there is distress, so you can see, anxiety depicted on the countenance, and the horse will stand, he can't lie down. Respiration will be materially increased; at this time you can see regurgitation of the blood in the jugular, and the beat may be so strong as to shake the whole body.

Treatment.—Therapeutical treatment would depend largely on the

cause, but there are a few general principles that must be observed in all cases—perfect quiet; if it comes from organic Disease of the Heart, strong stimulants are indicated—as alcoholic spirits, whisky, digitalis (which is the most important of all), and nitro-glycerine is often resorted to when the others fail. Tincture of cactus—cactus grande flores, is good in human where it is due to Indigestion. If the Palpitation is due to disturbance in any other organ, the Palpitation in that case would be reflex, so you treat the organ. In case of debility, anæmia, treat the blood. In case of Plethora and too fat, give purgative, reduce feed, and give more exercise. In the case of trotters or livery horses, usually it is only temporary, and usually a sign of nervous weakness. For Thumps, in addition to the quiet and stimulants, something should be given to quiet the excited condition of the heart—it must be allayed; aconite is the best thing in moderate doses, it allays without depressing the heart, and a little whisky with it is good, usually five to seven drops of the extract, and about ten of the tincture. Whisky should be given one-half pint first dose, then if necessary to repeat, 2 ozs. every fifteen minutes till relieved. After the attack is over then treat the cause. If suffering from nervous exhaustion, give tonics—as digitalis, etc. Powdered digitalis and solid ext. belladonna are prescribed, 20 grs. each, night and morning. If the blood is faulty give iron; a horse is liable to organic disease if worked too hard under any heart disturbance, or the heart being weak.

CYANOSIS OR BLUE DISEASE.—This occurs only in little animals and is seen after birth, due to faulty neglect of nature in not closing the openings—Foramen ovale or the ductus arteriosa, which allow the venous blood to mix with the arterial blood; this is often seen in babies, and they sometimes recover, due to the nursing they get; but young animals seldom do, and if they did they would grow up weak and delicate. It is recognized by the mucous surface being blue, and a lack of normal heat in the body; temperature is low. If babies can be kept alive for eight or ten days they will get well.

SYNCOPE.—Is fainting; when applied to the heart, means a fainting fit. Syncope may be fatal simply by fainting when in a severe form by the heart losing its irritability. Dependent entirely upon the failure of the heart action, followed by lack of blood to the nerve centers—as lack of blood supply to the brain.

Etiology.—As seen in the human, is from uterine hemorrhage, that is a common cause. Rapid bleeding from the jugular produces it; rapid accidental hemorrhage, also introducing air into the circulation; in that case it is very variable. That which can cause death might not cause Syncope. In Syncope in the human, they generally drop in a heap, may be from crowding, lack of air, etc. You should be able to tell the difference between it and apoplexy; Apoplexy is caused by Congestion of the Brain, usually a rupture of a blood vessel there; can be told by the purple appearance; in this case elevate the head and loosen the neck clothing; usually fatal, if from a rupture: good to put ice on the head also. Syncope is recognized by the extreme pallor; in this there is anæmia, give plenty of fresh air, loosen the clothing, particularly if it is a woman, lay on the floor with the head down. The shock of dashing cold water on the face is often good; let the person inhale aqua ammonia, but be careful in using; if they can swallow give whisky or brandy, hypodermic in-

jections of alcoholic stimulants, friction to body, and mustard plasters on soles of feet are indicated.

ACUTE INFLAMMATORY DISEASES.—These are three in number—first, is **PERICARDITIS**, inflammation of the pericardium, the serous sack containing the heart. This runs through about the same course as Acute Pleurisy, and terminates the same way—with serous effusion—into the pericardium, constituting the **Hydropericardia**, the same as **Hydrothorax**.

Etiology.—The most common cause is blood contamination—may be stated as the one cause. Diseases that usually exist as complications, are **Influenza**, **Strangles**, **Purpura Hemorrhagica**, **Pyæmia**, **Septicæmia**, etc., also **Rheumatism**, and probably the most common of all is **Rheumatic Fever**. But we notice the inflammation extends to the pericardium from inflamed surrounding tissues, as the lungs in **Pneumonia**, and **Pleura** in **Pleurisy**. But I think they would not cause it if the blood was not in a poisonous condition; but the ordinary sporadic diseases would not extend to the pericardium. Cancerous growths sometimes locate there, by broken ribs or foreign bodies accidentally piercing it.

Semeiology.—When arising, as it ordinarily does, from some previously existing fever, the original disease will be the most prominent, with considerable constitutional trouble, with the complication of **Pericarditis** coming with it. As the **Pericarditis** develops you notice the heart gets weaker, irregular in rhythm and in strength, and occasionally so weak as to interfere with it and cause distressing **Dyspnœa**, as seen in **Influenza** and **Rheumatic Fever**; without any disease of the lungs but the **Passive Congestion** that comes with it, is not recognized. If the **Pericarditis** is not severe, and if inflammation doesn't involve the whole of the pericardium, the effusion and effect will be small. It will run through the same course as **Pleurisy**: first, engorgement; second, inflammatory; third, effusion. It never arises from simple exposure. In case of extensive effusion, the effusion often coagulates so that it is often found coating the heart inside the pericardium, from one-fourth to one-half inch thick, and this causes the muscles of the heart to soften and weaken: the pulse gets weak, small and fluttering, and there is always considerable fever, say about one-hundred and four; with this weak pulse there is a **Dyspnœa** that increases as the watery effusion increases into the sack. This **Dyspnœa** is due entirely to faulty thoracic circulation. In consequence of the altered circulation and the **Passive Congestion** there is more or less exudation, and the lungs become sufficiently involved as to get a considerable cough connected with it. There is weak cardiac power, and consequently **Passive Congestion** of the lungs, effusion and disturbances of the nervous system, and with the increasing weakness of the heart there is coldness of the extremities, œdemic enlargements, loss of strength, and final collapse and death. Even where the trouble is moderately severe and the effusion is absorbed, it leaves a chronic lesion and affects the horse afterwards. We find it often forms an ante-mortem clot, especially if it goes to the posterior aorta, and especially in the iliac bifurcation, and may shut off the blood from the iliac artery. This clot sometimes causes sudden death.

Treatment.—If the condition of the animal is induced by primary lesion, (but it usually comes as a secondary lesion), and if with **Influenza**, you must deplete him; but if with **Strangles**, to deplete him would hasten

his death, so you must treat according to indications. But if it can be diagnosed in the first stage, depletion is indicated; you may give diuretics and quinine. Then after the first stage is passed, stimulants are indicated, milder at first but increasing as the development of the weakness goes on. If you let the heart get weak, the effusion will be greater, so always keep up the heart strength with anything. Good nursing, and by one who can take the pulse, is essential and horse may recover. The heart in this condition is very susceptible, so you cannot use digitalis in mixture, but must be given once every three hours alone, as the case requires. As the heart increases in strength it diminishes in frequency, and with digitalis it will increase in frequency, especially if the digitalis is carried to extremes. If Pericarditis can be diagnosed, counter-irritants to the left chest, or hot fomentations are good; heat is particularly indicated, for it seems to partake of the nature of Rheumatism, and heat allays that pain, while cold aggravates it. In the third stage, cantharides as vesicant can be applied to the side. Give iron and stimulants to maintain a strong heart; salol and quinine or salol and tenacitine. The salol is usually given in dram doses every three to six hours; acetanilide may be given with it—it may be passed back into the mouth and the horse will chew and swallow it. May give iron internally along with the potassium salts; digitalis, whisky and quinine may be used to good effect, but salol is the best drug of them all; it is antiseptic and does not depress the heart. But unfortunately, in spite of all you may do, the animal dies. Autopsy shows serum in the pericardium sack, and accumulations around the heart.

ENDOCARDITIS.—This is inflammation of the endocardiac lining of the heart and the lining of the cavities of the heart, and associated with it usually is VALVULITIS, or inflammation of the valves, that would naturally follow. They are very seldom seen except as the result of Septicæmia, or septic of any kind is liable to produce Endocarditis; and as the lining membrane is probably the most delicate and sensitive membrane in the body, it would be easily affected with poisonous blood.

Symptoms.—Are the same as in Pericarditis; heart loses its strength, flutters more and more, apt to be spasmodic and irregular; Dyspnœa very great, regurgitation seen in the jugular.

Treatment.—Depends on the septic condition found more than to the heart trouble, and if you can purify the blood the heart may recover. Blood letting is contra-indicated. Give antiseptics—as salol, hyposulphate soda, bicarbonate potash or soda, etc. If in case of recovery their condition will admit of it, give iodide of potash; see to the hygiene—good nourishing food, warm quarters. This disease is also usually fatal. In the autopsy there are black patches on the lining of the heart, and may be from the size of a pin-head up to the size of your hand; these patches may extend over the valve and around it.

MYOCARDITIS.—Spoken of as Carditis; this is inflammation of the muscular structure of the heart. This disease is also due to Pyæmia and Septicæmia, sometimes can be traced to foreign bodies, especially in cattle—often things are swallowed and pass through the walls of the stomach and the walls of the heart; often from Strangles, in the horse. It usually terminates fatally, and sometimes in autopsy there is found three or four

abscesses in different parts of the body. In cattle we find it in Tuberculosis and Actinomycosis.

CHRONIC INFLAMMATORY DISEASES OF THE HEART.

HYPERTROPHY.—Means enlargement; may indicate new growth. As applied to the heart, always means enlargement of the organ; this occurs by the thickening of the walls with or without dilatation of the cavities. This unnatural development may be general or local over one ventricle or over both, or only a part of one. It often alters the shape of the heart; may have a round appearance. The left ventricle is the most liable to this development, probably due to the greater amount of work it has to do. We notice that sometimes this enlargement is by new cell growth; the cavities becoming enlarged, the heart is enlarged very much, but without increasing the thickness of the walls, or may be possibly thinner; they usually remain the same, when this is the case it is known as Simple Dilatation. On the other hand, we have immense thickening of the walls without dilatation, then it is known as Simple Hypertrophy; but in draft horses we find thickening of the walls and dilatation of the cavities come together; that is, they seem to keep pace with each other, then it is known as Eccentric Hypertrophy, and is seen chiefly in trotters. The horse may maintain his health on account of the two changes keeping pace with each other. When the walls thicken, as in the Simple Dilatation, there is less blood in the body than in either of the other two cases. Occasionally we find that the increase in the thickness of the walls of the heart is so great and so quick as to encroach on the cavities; it is then known as Concentric Hypertrophy, and in it there is a diminution in the quantity of blood in the body. This kind is rare in the lower animals, and may say Heart Disease is rare in them.

Etiology.—Is usually long-continued, severe exertion; dilatation of the cavities without thickening of the walls is liable to occur in or with valvular weakness of the heart. The way that occurs, in systole action the blood is not all pumped out, then diastole follows, the blood rushes into the ventricle; there being an increased quantity of blood there, the ventricle gets dilated; as also where there is valvular weakness there may be regurgitation of the blood back into the ventricle, and the dilatation occurs same as in the last case. Mild inflammation is liable to produce Simple Dilatation, or Simple Hypertrophy, or Eccentric Hypertrophy, but the Concentric is early, long-continued exertion; in this trouble the horse usually dies from some other disease than this. In Post-Mortem you will find the heart changed—usually the left ventricle is the most enlarged.

Semeiology.—Pulse full and strong; in these cases, except in the Simple Dilatation, when it is more or less weak, you will find by auscultation that the sounds are muffled, pulse runs on from slow, steady to irregular, intermittent, weak, and as that increases Dyspnoea gets worse, also the coldness increases. Character of the pulse will indicate the condition of the heart.

Treatment.—Search for causes of trouble and lessen their effects. Keep animal from excitement. Digitalis, iodide of potassium, and in certain cases caffein, and in circulatory troubles stimulants are indicated.

ATROPHY OF THE HEART.—Means a contracting or wasting of the muscular substances of the heart; it grows smaller and harder, the hard-

ening being so extensive sometimes as to amount almost to calcification. The chief feature of it is weakness of the pulse; in the horse you could not take the pulse at the jaw; as a result of this extra weakness, changes are apt to take place in any part of the body.

FATTY DEGENERATION.—Is transformation in the heart; there are two kinds, or rather two ways. First, Fatty Infiltration, that is deposits of fat between the fibres of the heart. Second, Fatty Transformation; the muscular cells become transformed into fat cells; as a result of this kind of change the heart becomes very weak, the muscular fibres become flabby.

Post-Mortem.—Shows the heart is usually larger, the muscular fibres softened and pale and easily punctured; the muscular cells often retain their nuclei even after the change to fat cells.

OBESITY OF THE HEART.—Is a fatty condition of the heart, or an immense deposition of fat around it, more than the normal amount. The result of this is a weak heart, shortness of breath, which runs on to Dyspnoea; the animal may be all right when standing still, but on exercise the trouble shows.

POLYPUS OR TUMOR OF THE HEART.—Develops on the inside of the heart or on the outside; they are more likely to take the form of Polypus on the inside. They are usually found to be composed of organized lymph, perhaps floated there from some other part of the body, and become attached to the base of the heart, rather the base of the valve; sometimes it is a regular fibrous growth—is seen following the inflammation. They are more often found on the lining of the auricle than on the ventricle, due to the difference in the action of them. They are usually polypoid in form, vascular, and when attached to the base of the valve often extend through the opening of the valve, interfering with the circulation, and often cause Thrombus. These often float through the large vessels and lodge in the brain, where they produce coma and finally death. When this lymph forms a Tumor around the valve, it can be distinctly heard, by auscultation, as a rasping sound. Vascular Tumors are often found on the outside—these are usually on the apex.

RUPTURES.—May occur from sudden and violent exertion, or falls, collisions, etc., and generally the heart is predisposed by some of the other troubles mentioned; the heart substance becomes weak and the rupture generally occurs in the left ventricle, still it may occur in the auricles; jumping often causes it.

VALVULAR DISEASES OF THE HEART, OR VALVULITIS.—There are two kinds—Valvular Obstruction and Valvular Insufficiency. These are very common in heart diseases of the human, and not uncommon in the horse. It is chronic inflammation of the valves. The Valvular Obstruction produces a thickening and corrugation of the basis of the valve, so great as to obstruct the flow of blood through the opening, very materially. Valvular Insufficiency is where the effect of the inflammation seems to be to contract the base of the valve, thereby drawing the fibrous tendons of the valve downward, tensing them, this leaves the opening insufficiently guarded, and as a result of that after ventricle systole during the following diastole, the blood regurgitates from the aorta back into the heart. As a result of either of these, but especially the latter, we get a weak circulation, and the pulse is very apt to be irregular and

uneven and small. The vital parts of the body suffer from innutrition, and soon or later there is a wasting of the body. The two conditions may exist in different valves at the same time, or you may find one valve affected in one way, or on one side with one, and the other side the other way. In Valvular Insufficiency the Dyspnoea is well marked on exercise; the Palpitation is more frequent, and the jugular pulse is often seen. There are often enlargements on different parts of the body and legs; œdemic condition under the belly, Ascites, Hydrothorax, etc.; these may occur in any weakness of the heart. Passive Congestion of the lungs often takes place, and to such an extent as to run on to exudation, Dyspnoea and coughing; or hemorrhage from slight wounds. Vertigo or Apoplexy is liable to take place from ante-mortem clot; these are more likely to form in the horizontal arteries in the horse, in the posterior aorta midway between the diaphragm and the iliac bifurcation, but are liable to be in any of the arteries. These ante-mortem clots are of a grayish white color, and when old are quite firm and hard, when first taken out they feel hard as a liver. As a result of this weak circulation there is a paleness of the mucous membranes.

Treatment.—As a rule can only palliate the trouble—can't be diagnosed during life; must treat according to the conditions. It will prove fatal; will die of Asthenia; but there are symptoms of approaching death or predisposition to fatal termination, but the time is indefinite. The real causes are incurable except it be in the case of obesity; you must treat the symptoms, and may ward off the time by stimulants that apply directly to the heart—as digitalis, nux vomica, iron, mineral acids. The true nature of this disease can only be known by autopsy.

ECTOPIA CARDIS.—Is a congenital displacement of the heart; may be found on the right side, or other place, or even outside of the thorax and in the abdominal cavity, and yet not interfere with the health of the animal; but it usually interferes with the circulation, and they don't live long. This may be seen in still-born animals sometimes.

ARTERITIS.—Is inflammation of the walls of the arteries, and is often followed by Aneurism. It often occurs by wounds or by pressure, as in cows; the iliac is injured in parturition by the use of instruments, and often caused by parasites, as the *Strongylus Armatus*, which are often found right under the coat of the artery, and set up more or less inflammation and obstruction. Death usually follows an attack of Arteritis. Death is inevitable when the cause is parasites. Often seen in the mesenteric and colic arteries.

Treatment.—Apply cold to the parts, if possible; if not practicable, as in the arteries named, treat on general principles—give quinine, acetanilide, belladonna.

ANEURISM.—As a result of the first, is apt to cause stricture and get an increase of the substance of the walls of the artery by proliferation, thereby diminishing the caliber of the artery. When it occurs on the inside it obstructs the blood and there is pressure and dilatation. If there is complete stoppage, it is not Aneurism, but only where there is a partial stoppage, and this occurs most often in the abdominal cavity or region in the posterior and iliac arteries. The indication which leads us to suspect Aneurism is a peculiar lameness that subsides on rest, and only shows during exercise; he may get suddenly lame and sweat, and may get so

bad will refuse to move at all—Passive Congestion has taken place, due to Thrombus, and causes the pain. If you then examine, per rectum, you may find the pultating Tumor. Sometimes may not cause any trouble till there is a rupture, then it will be fatal.

Treatment.—If you can get at it, try to reduce the pressure by truss; if not, then ligate above or anterior to the point of stoppage; but on an important artery you can't do that.

PHLEBITIS.—Inflammation of a vein; there are two forms, Traumatic, which comes from a wound, and Idiopathic, which is the most common form in man, but not in horses; may be seen in parturition fever; in that case it is due to lymph getting into the vein and plugging it.

Semeiology.—If it be in the jugular, say from bleeding, suppose from unclean instruments; in the course of a few hours after the operation, the wound swells, also the vein, gets painful and hot, the neck gets stiff, edges of the wound turn out like a cauliflower or mushroom, due to the granulation. The Thrombus forms around the opening, enlarges quite rapidly till the vein is plugged; then all the blood in the vein coagulates to the heart, sloughing around the wound occurs, ulceration, the clot sometimes breaks down and leaves an opening in the upper part of the vein, and there will be a liberal hemorrhage which if not noticed soon will prove fatal. The animal is inclined to hang his head.

Treatment.—Elevate the head and keep it up—suspend it in some way. Treat antiseptically, generally strong at first, then milder. Sometimes the vein becomes this way on account of a pin being run through in operating; remove if so, and if the blood lies between the vein and the skin, cut down and expose the vein and remove the blood. Sometimes it runs on to suppuration, and if resolution does not take place in four or five days the vein becomes obliterated and remains as a rope-like enlargement; should watch out for this in examining for soundness. Horses with obliterated veins do not suffer much except when turned out to pasture; hangs his head for a long time, and the veins on the other side swell, and the head swells.

VARICOSE VEINS.—This is a disturbance of a vein; the only instances we ever see it in is in the saphena major, from pressure by Bone Spavin; horsemen call it Blood Spavin. Varicosity would of course occur below the pressure. It is idiopathic in its nature; the causes are not well known.

Treatment.—Pressure is about the only treatment; in the human they use the elastic stocking and elastic bands. In case of Bone Spavin you will find the saphena major will be enlarged, so in firing you must be careful not to press your iron too heavy when over it.

DISEASES OF THE URINARY SYSTEM.

THE KIDNEYS.—The chief office of these organs is the secretion of urea—removal of the surplus water in the body and the surplus nitrogen, in the form of urea. The kidneys are about the first organs affected by these diseases, and the study of the urine in case of disease gives us valuable information. Bear in mind that the urine of the herbivorous animals has an alkaline reaction, that of the carnivorous has acid, and the omnivorous is neutral, or may be either. There are two acids in the urine—Uric and Hippuric. Hippuric is more common in the lower animals, and the Uric

in the human. The composition of the urea is $C N_2 H_4O$ —which makes it highly nitrogenous, and by the retention of this too long in the body it becomes poisonous by decomposition, and results fatally. In the human the urea is about $3\frac{1}{2}$ grams per day, per pound of the weight of the body; in a horse weighing 1000 pounds, about $7\frac{1}{3}$ ozs. per day, so you can see how serious it would be in poisoning the blood if not removed; this is seen in Azoturia. The ingredients in the urine in these diseases are: sugar, albumen, biliary coloring matter, biliary acid, pus, blood, spermatozoa, lactic acid, and oxalic acid. Then there may be deficiency or an excess in the secretion of urine; in man, in normal, secretes about $52\frac{1}{2}$ ozs.; for 1000 lb. horse, about twenty pints per day; and if there are only ten or less secreted, it indicates disease also—as in Purpura Hemorrhagica, where they often run forty-eight hours without urinating. In such a case there is retention of the poisonous matter in the body. Specific gravity of urine in the human is about 1005 to 1025—1018 average; horse, 1030 to 1050. Urinometer is the instrument we measure the specific gravity with. The more solid constituents the urine contains, the higher the specific gravity will be. In Diabetes the specific gravity is away down—1002 to 1003; while in the human it runs up from 1030 to 1050; at 1002 it is about clear water.

Diseases recognized as being due to abnormal ingredients in the urine are, first, Albuminuria; second, Hæmaturia, or Bloody Urine; third, Diabetes Insipidus; fourth, Diabetes Mellitus; fifth, Albuminuria in Cattle, or Red Water; sixth, Oxaluria, when it contains oxalic acid.

ALBUMINURIA.—In the horse this can be safely called the Equine Brights. It occurs in two forms—Acute and Chronic. In the horse it is mostly due to Indigestion—to Chronic Indigestion. When there is emaciation going on we are almost certain to see albumen in the urine, and also seen in Strangury, which may be from the applying of cantharides over the surface of the body, and especially over the kidneys. In Bright's Disease, the chief thing is the presence of the albumen in the urine; but sometimes there may be none present, so in examining the urine for it you should make two or three tests a day, and for several days—you can't rely on a single test. Albumen Nephritis in the horse resembles Bright's Disease in the human. In Azoturia the presence of albumen is variable in the urine, sometimes in it, other times absent. In most all diseases of the kidneys, as in Albuminuria, there are thread-like cylinders, composed of fibrous coagulum called cast tubes or tube casts; this coagulation takes place in the tubuli uriniferi. These tubes terminate in the malpighian tufts. The tube casts do not always indicate a serious condition; unless present with disease it is simply a corroboration that some disease exists. In the process of Fatty Degeneration you will find with those casts, globules of fat and oil in the kidneys, which show there is Fatty Degeneration. There are two kinds of degeneration—the large white kidney, which when cut across shows the white increased in size, and particularly the cortical portion is increased in quantity. But the medullary doesn't seem to be altered; the whole of it is soft and smooth, and Glisson's capsule is easily stripped off; it looks and feels like wax, and when completely degenerated is useless as an organ. The small red is the other extreme; while degenerating it becomes small, red,

hard, and rough on the surface, by little nodules, and the investing membrane. Glisson's capsule cannot be removed.

TESTS FOR ALBUMEN IN THE URINE.—Put some of the affected urine in a test tube and boil it; if there is any albumen in it a white coagulum will form; phosphate will do the same, but if you add a little nitric acid the phosphate will be dissolved, and if there is any albumen in it, it will remain clouded, unless you add too much nitric acid, in which case the albumen would also dissolve. If it is strongly alkaline it will also coagulate, or an excess of urea will without the albumen, so to test for these, take some urine in a test tube and dip into it litmus paper; if it is alkaline the paper will turn blue, if acid, it will turn red; if it does not change, then it is neutral. If too alkaline you can weaken by adding a little acetic acid; if too acid add a little ammonia. This paper comes in three kinds—alkaline, acid, and neutral; best to test more than once always. When you test by boiling, if the coagulum is alkaline and no albumen, adding a little nitric acid will clear it up; if there is albumen it will remain clouded. Another test is simply pouring the nitric acid into the urine—if there is albumen in it, it will coagulate. Billing's test: take an equal quantity of urine and saturated solution of sulphate soda—the water you dissolve the soda in must be pure, mix and boil, and the slight trace of albumen will show.

Semeiology.—The first indication in the horse is stiffness in the gait on the hind part. In old confirmed cases they step about eight or ten inches to a step; they are stiff in turning, and are inclined to stretch—as in staling; after a while he begins to suffer constitutionally, will get hide-bound, long coat, stiffer and stiffer in the hind parts, finally gets down and is unable to get up, the hind parts are paralyzed, followed by delirium, uric poisoning and death.

Treatment.—If it can be discovered in time, may be able to give relief, but it is generally too late when made known to us. Give a complete change of food; ninety-nine times out of a hundred it comes from the mal condition of the food. Treat the digestive organs; give arsenic, charcoal, etc.; also sulphate of soda, night and morning. Carbonate or citrate of lithium, with the view of neutralizing nitrogen, in one dram doses, night and morning, is indicated. Give lots of bran, little nitrogenous food; give him a vacation, protect from colds and stormy weather—in this he will be predisposed to Rheumatism. Hydrochloric acid is good, say alternating a week about with bicarbonate soda.

HÆMATURIA (BLOODY URINE).—Due to Acute Congestion of the Kidneys, or different degenerations that occur; invasion of the kidneys by Cancers, Melanosis particularly; calculi in the kidneys or in the bladder; blows across the loins, parasites, especially the *Eustrongylus Gigas*, these seem partial to the kidneys, and develop enormously. (A male ten inches long, and a female fourteen inches long were taken from the kidney of a dog that died in the college.)

Treatment.—That depends upon the cause; if from blows across the loins, apply cold, also anodynes, per rectum,—as opium, belladonna, etc.; give fluid extract ergot internally if necessary, but bear in mind it is often the indication of some other disease, so look for that.

DIABETES INSIPIDUS (POLYURIA).—Is excessive urination; this is produced wholly by Indigestion; the chief characteristic of this disease is

excessive urinating, and amount of water and its clearness—stable men call it flooding. The specific gravity is the same as clear water, about 1002 or 1003. Clear urine is always abnormal; there is a deficiency of the salines in the urine. We find in horses it is often premonitory sign of blood poisoning—as Glanders.

Etiology.—There are Intrinsic and Extrinsic causes; Intrinsic is some faulty condition or mal assimilation on the inside, and Extrinsic, that arising from outside the body—as improper food, musty oats or hay, or kiln-dried oats, or from the free use of diuretics, or badly harvested hay; this is proven by it becoming Enzootic in some parts of the country that harvested during wet weather.

Semeiology.—Profuse staling, floods the barn, in bad cases, especially in the mare, will pass a gallon every half hour, and as clear as water. Thirst increases; this excessive thirst may have existed before the Polyuria, that was induced by Indigestion; appetite capricious, will eat dirt, his own dung or bedding; this is an indication of Indigestion. In cases of this kind the horse becomes rapidly debilitated, long staring coat, mucous membrane pale and anæmic, mouth sour and pasty to the feel; if allowed to run on will die. The kidneys of dogs seem more liable to disease than other animals, and are easily diseased.

Post-Mortem.—Pallor of the kidneys; soft and easily torn; kidney substance as well as Glisson's capsule is easily removed.

Treatment.—Iodine is an elegant remedy, often a single dose will do; it will arrest the thirst and relieve the disease—this is usually given in doses of 1 dr. in the crystal or in linseed ball, repeated once or twice a day. Be careful not to give enough to produce iodism, and in the dog too much may produce Atrophy of the testicles; may follow with tincture of iron. Often in the horse a table-spoonful of starch, night and morning, in the early stage may arrest the disease. If due to overfeeding, give purgative, and bran for food for three or four days.

DIABETES MELLITIS.—This is a disease of the kidneys in which we find sugar in the urine, often known by two other names—Melituria and Glycosuria. Prof. Williams says he never saw these in the horse or herbivorous animals, but Prof. Robertson claims he did; Williams saw it in a dog that was fed on liver. There are two other abnormal ingredients in the urine besides the sugar—pus and mucous. Mucous is a constant ingredient of the urine, but occasionally there is an increase from some diseased cause, especially when the bladder is irritated. This mucous may be seen in a floccular cloud, and is easily shaken up when the urine is in a bottle; it never settles. Pus is often found, but unless very plentiful need give no alarm; it settles on the bottom of the bottle in a yellow opaque deposit, and is easily shaken up; it makes the urine cloudy.

Treatment.—For these three, avoid all irritating substances, both in food and water; this will also apply to all irritating diseases of the kidneys; a change of food or water, or both; bland drinks—as of linseed tea; starch will often relieve; bicarbonate of soda is very good. If the increase of mucous is due to the irritability of the urinary organs, then bicarbonate soda is indicated; after giving for a few days, give tr. iron.

HÆMO ALBUMINURIA IN CATTLE, OR RED WATER.—Is an albuminous disease of the kidneys, with bloody urine; there is no blood in it but it looks like blood. In this case the urine varies in color from a light

red to a black, due to the coloring matter of the blood, but there are no corpuscles in it. This disease is confined to cattle, and there is nothing like it seen in other animals. It is really a constitutional disease, and is very rare in this country, common in England and Scotland, and may occur at any time of the year, in either sex or at any age, but is seen most in milk cows after calving, due to the drain on the cows secreting milk.

Special Pathology.—The most prominent symptom is change in the color of the urine; first begins to get red, and grows darker and darker till it becomes almost black—in some cases it is black, but there are no clots in it at any time. This urine contains albumen in large quantities, and sometimes considerable iron; that indicates a disease metamorphosis in the body. You will find large quantities of tube casts, epithelial cells also; this may come from the ducts in the kidneys or from the blood. The blood we find becomes changed; the corpuscles become changed in size, the red ones break down and the protoplasm becomes scattered and dissolved, and often the white corpuscles become ruptured, letting the contents escape; we find the walls of them, but they are empty. The specific gravity of the urine becomes lighter on account of the escape of albumen, or rather the blood instead of the urine. The albumen escapes into the urine.

Post-Mortem.—There is an anæmic condition; there appears to be an absence of blood in the heart—it is empty; the animal looks as if he had been bled to death. Ecchymosis is seen in the serous membrane. There are indications of the watery condition of the blood as seen in *Purpura Hemorrhagica*, or of rupture of the capillaries. In this case it settles in spots without rupture; on the under side of the kidney, between the capsules, is ecchymosis; the uterus is also congested some. The kidneys are pale; the uriniferous tubes are filled with coagulated mucous or lymph, but that doesn't interfere with urinating. The liver is darker, softer, and larger, and is engorged with venous blood, comparatively, to other parts of the body; bladder is full, even to considerable distention.

Etiology.—It originates in the impoverished condition of the blood. Anæmia develops as a result of this impoverished condition; this is due in most cases to want of proper food. The albumen of the system becomes degraded and broken down on account of improper support; this usually occurs in cattle pastured on low grounds, particularly if they are swampy. We find it also in animals fed over abundantly on roots without grain; the roots are watery and contain considerable sugar and little albumen—forming material in them. When due to swampy pastures, the disease leaves when the pasture is well drained. This disease is never seen in stall-fed animals.

Semeiology.—When it occurs in milk-cows after calving, may develop in from fourteen to fifteen days, that is when the strongest drain on the system is going on. There is debility; diarrhœa, loss of milk. As they suffer the pulse rises, it is weak and fluttering, defective cardiac power, Diarrhœa is attended with arching of the back, pain; Constipation usually follows, this is due to Paralysis of the bowels; fæces becomes dark, probably due to the poor quality of food; Palpitation of the heart is seen when the animal exercises; the animal grows weaker and weaker, emaciation comes rapidly until the climax is reached, about the third day,

when the urine is then thick. Polyuria greatly increases, dark in color; it runs on to general debility, collapse and death.

Treatment.—The main part is in prophylactic treatment; this lies in changing the food; change the cattle to higher ground, or feed on more nitrogenous food, and as for the thickening of the urine, put on oats and beans—they are richer than corn in the properties you need. Prophylactic treatment is to let cows come to calving-time strong and well-fed, not thin and weak, when they will be predisposed to this trouble; so give nitrogenous food a couple of days before they calve. Therapeutical treatment doesn't amount to much; chief hygienic treatment is in removing the cause. When it is caused by the food, it is good to give oleaginous laxative; tincture of iron may be given internally.

Prognosis.—Is liable to be unfavorable, depending on the stage in which you get to see it. If you don't get it early you need not treat it.

OXALURIA.—This is a condition of the system in which there is oxylate of lime, of urea, and sometimes free oxalic acid in the urine; they are abnormal ingredients. Oxalic acid is supposed to result from imperfect digestion; we find it in plethoric animals and in overfed ones, and where there is insufficient exercise. In most cases of Indigestion there is acidity of the bowels; this is particularly so in Oxaluria. It may be said Oxaluria only exists where there is an acid condition of the bowels; roots, etc., rich in saccharine matter, sometimes cause it; sometimes where there is an albuminous condition of the whole body or system.

Semeiology.—Dullness, loss of flesh, even with good appetite; capricious appetite, stiffness of the loins, hide-bound, and there is a profuse exfoliation of a bran-like scurf from the skin. These symptoms will arouse your suspicions and you will test the urine; you will find all the symptoms of Indigestion—as licking the walls, eating his dung, bedding, etc. There seems to be pain in passing the urine, both before and after, switching their tails, picking up their feet, moving around, etc.; mouth has a sour smell, pasty feel. The whole trouble is faulty digestion and mal assimilation. The urine may be acid if it contains oxalic acid, or neutral if it contains lime. If the urine is not retained long in the bladder, the oxalic acid soon develops on exposure to the air; this is in octohedron shape in the human, and is soluble in nitric acid without effervescing; insoluble in water and unaffected by boiling; that is in acetic acid or liquor potassæ.

Treatment.—Regulate the diet; withhold all roots and all sugar; give good exercise; it is often good to change the water unless you are watering on river or rain water. I have seen cases where it was impossible to do anything without changing the water, particularly for fine bred stallions, as in them it is a result of idleness and high feeding. This may develop in the mare season, and he will not notice the mare when brought out. I find it is due in many cases to well water, so give attention to the water; and on account of the exfoliation from the skin, groom well with a sharp currycomb. A mild laxative or purgative is indicated—a moderate dose of aloes, followed with mineral acids and vegetable bitters. Occasionally the irritation of the bladder is so severe that it is necessary to give local injection—in the male in the urethra, in the female in the vagina, as a mild solution of boracic acid. The acid phosphate of soda and

bicarbonate potash are good; also injection of warm water with belladonna or tincture of opium in it.

RENAL CONGESTION.—This is simply a hyperæmic condition of the kidneys; from some reason or other this is not very common in the horse compared to other animals, but is seen occasionally; sometimes seen in connection with some specific fever, sometimes as a result of irritating substances in the food or drinking water, or from too large doses of cantharides or turpentine used as vesicants over too large a surface, or too liberally applied. Exposure to cold and dampness causes a sudden rush of blood from the surface to the internal organs, so the kidneys suffer this way sometimes; also from accidental injuries, or from anything that produces bloody urine. We sometimes get an acute form starting in the malpighian tufts as a result of blood contamination.

Post-Mortem. If the kidney is cut across you can see it is heightened in color, especially the malpighian tufts; dark red-like patches of ecchymosis—these can be seen showing through the capsule before it is cut.

Semeiology.—The symptoms occurring are complications of other diseases; the urine is lessened in quantity, and that which is passed is darker in color and the specific gravity is increased; often blood and the coloring matter of the blood are found in the urine. Oftentimes the Congestion in the kidneys will recover if the original trouble subsides. This Nephritis in the acute form exists in two forms or ways, and in two distinct circumstances; the etiology and symptoms are quite different, as seen in the urine secreted; the first is

ALBUMINOUS NEPHRITIS.—It occurs as a sequel to some other debilitating disease, or some acute fever in which the combustion was increased, the malpighian tufts became congested and blocked up with debris, also the uriniferous tubules became blackened, and this runs on to Nephritis. This kind of Nephritis is very common in the dog and cat, also in the human, but rare in the horse and cattle. In pigs it is generally associated with Hog Cholera, to a greater or less extent.

Special Pathology.—As a result of the fever the broken down tissues are gotten rid of through the kidneys; this debris blocks up the kidneys. In the capillaries the nutrition of the part as well as the functional part of the kidneys is interfered with; this Congestion produces exudation into the cellular tissues, as well as into the uriniferous tubules; the tissue around the malpighian tufts become infiltrated and hardened; this produces pressure on the tufts, and interferes with their action. A mild acute inflammation follows, which is liable to be largely interstitial and partly parenchymatous. This interstitial or albuminous Nephritis is known in the human as Bright's Disease, and is seen in the lower animals. There are two forms of this—Acute and Chronic (Bright's). The Acute comes on the same as in the dog and cat, but the Chronic comes on without any apparent cause, and comes on gradually; probably it is due to mal assimilation of the food and the increase of tissue waste. This produces a blocking up of the glomerules and the pressure on the spots of the malpighian tufts; may attack one or more, or one kidney or both. You might test the urine every day for a week and not find any albumen, and another day find it in large quantity; but in the Acute it is

present all the time. The Acute runs its course quite rapidly and is usually fatal; Chronic may run for years and then prove fatal.

Semeiology.—The urine becomes scanty and seems to be cut off; the urine is passed in pain, and what is passed is thick and heavy, and highly colored; in it are tube casts in great numbers, and more or less albumen, also sometimes blood in it. If very Acute it runs on to a fatal end in a few days, but it is usually Subacute, and while running on emaciation takes place, great languor, coat staring, and may get Ascites. The heart gets weak, due to diminished cardiac power or poverty of the blood; this last leads to weak mind. There is usually dropsical swellings, and as the disease progresses the kidneys degenerate—to the large white, or small red. In the Subacute, leading on to degeneration, there is little or no pain, no constitutional disturbances. There is great stiffness of the loins.

Treatment.—It wont do to stimulate the kidneys in this case, so if well developed try to get rid of the debris through the skin and bowels; give liquor ammonia acetatis; keep up your laxatives—sulphate magnesia and sulphate soda are good. Nitric ether in small doses acts as a fusible stimulant, and a mild diuretic; feed laxative food, see that it is easily digestible; give gentle exercise. If treated early the kidneys will recover, but if not, degeneration follows invariably and leads on to Chronic Bright's and death.

NEPHRITIS PARENCHYMATOUS.—(Acute)—This is inflammation of the kidneys, corresponding to Pneumonia in the lungs and not depending on any previous existing disease; it arises as an original lesion. There is no albumen in the urine at any time, no dropsy; almost invariably fatal.

Semeiology.—Accidents to the lumbar region; over-exertion often causes it by rupture in the capillaries, falls on the floor, lacerating the psoas muscles, which are so close to the kidneys that the inflammation extends to them; exposure to cold rains, or where horse is left in the rain with the loins unprotected, often follows this in a few hours. Often see it from calculi in the pelvis of the kidney, and in the uriniferous tubules. It comes on suddenly always; severe colicky pains with high fever; may be distinguished from Colic by being continuous and with high fever—may be 105 or 6, and in this case there are frequent attempts to urinate; every few minutes will try, and pass only a few tablespoonfuls at a time, and this is very red. Constant sweating, and uneasiness usually, but not always. In the first six or eight hours is disinclined to move, and if forced to, will straddle and take short stops, will look back at the flanks. Put your hand into the rectum and turn upward, may feel soreness; or on pushing the fingers under the transverse processes of the lumbar vertebrae, will show pain. There is complete loss of appetite; abscesses are liable to form in the kidneys; these develop as a result of faulty nutrition. There may be one large one, or a number of small ones. They sometimes break through the uriniferous tubules and pass out in the urine; sometimes they destroy the tubules. This disease usually terminates fatally in from three to five days; animal dies partly from exhaustion, partly from uric poisoning, and partly from general distress and pain.

Treatment.—Old authors recommend blood letting in the early stage; may be beneficial, but if you don't do that, give generous laxatives—oil in liberal doses, 1 quart. If there is no response in twenty-four hours,

give a pint more oil; follow up with saline. Give linseed tea to drink and no water—make the tea with cistern or river water. Give aconite, belladonna, acetanilide, etc. Diuretics are contra-indicated. Work the bowels, but let the kidneys alone. Hot cloths across the loins are good; I prefer them wrung out in hot water and covered with a blanket; hypodermic injections of morphine to allay the pain; must be kept quiet. If the heart gets weak, give liquor ammonia acetatis, or digitalis; also veratrum or calomel, and a little opium in dram doses of each, two or three times a day, but don't overdo the laxatives; if you give the calomel, then don't give as much oil, or give less calomel. If he is going to recover, will pass the crisis in about three days, if not he will die in four, or four and one half, or five days.

RENAL CALCULI.—Sometimes form in the pelvis of the kidneys; these are little uriniferous stones, sometimes one or may be one hundred little ones while forming, about the size of a pea, will float out in the urine, through the ureter, causing spasm of the ureter, which will contract on the calculi, and so becomes plugged; if it remains so, inflammation sets up, the urine sets back and produces uræmic poisoning.

Semeiology.—Colicky pains at irregular intervals, especially on exercise. In the urine in this case there is a predisposition; there is a superabundance of alkali in the urine, and this often leads on to the forming of these stones; so if you suspect their presence test the urine; you will find great quantities of this earthy matter, and the urine may be bloody. When blood is seen you can determine that the stones are already formed; if you examine the bladder you can find them there, per rectum, you will find the ureter distended as large as a man's wrist. If they are in the pelvis of the kidneys you can produce pain by pressing against the kidneys. Abscesses sometimes form as a result of the calculi; there is rapid degeneration of the kidneys where the ureter is blocked, or through pain of these abscesses, and the animal dies.

Treatment.—Change the food, especially the drinking water—give rain or river water. Avoid food rich in salines; give laxative food; change from corn and oats to roots, etc. Give remedies that have a tendency to dissolve these, as hydrochloric acid, 1 dr. to horse, freely diluted, once a day. These calculi are very common in dogs in this country, and as a rule yield readily to treatment; hydrochloric acid, dose 1 to 5 drops twice a day in sweetened water, is good.

CYSTITIS.—This is inflammation of the lining of the bladder; it is not so common in the lower animals as in the human, because in the human there is a contagious disease (Gonorrhœa) that affects the urethra; it runs up and affects the bladder. It is very doubtful if this exists in the lower animals, hence diseases of the bladder are rare in the lower animals; but diseases of the bladder do occur from the following causes; irritating substances, either in the food or water; croton oil for instance, cantharides, and turpentine applied to the surface. Calculi and foreign bodies, these are liable to occur in any animal—as gravel for instance; the catheter is inserted, and a piece becomes broken off and remains in the bladder—this finally causes a fatal Cystitis.

Semeiology.—First, if Acute, there is considerable excitement of the system, and later, nervous prostration. During the existence of the prostration there is great pain, but not constant; at times it is very

severe, and the distress is great; the urine is voided in small quantities at a time, and is hot and red. In case of calculi the urine is occasionally bloody, and is passed with pain—that is the time of contraction of the bladder on the urine to expel it. In this case the muscular contraction is very severe, it amounts to a regular spasm and is known as TENESMUS of the bladder—it is awfully painful. A person doesn't usually suffer when in a recumbant position, but when he stands up the desire to void comes on, and there is pain in the passage. In the lower animals this is not experienced; I think this is due to the animal being in a horizontal position. But we have every reason to believe that Tenesmus is very severe in the animal. The bowels are usually constipated, and what is passed is coated with slime and coagulated mucous, showing evidences of fever. If the irritant producing it be taken into the mouth, there is more or less inflammation of the whole mucous tract, but of the urogenital organs more particularly; but if absorbed it does not hurt the mucous tract, except the urogenital. Sometimes the inflammation is severe enough to produce death in three or four days; other times will run on three or four weeks, and finally die from collapse. This may occur especially in the case of foreign bodies.

Treatment.—Remove the cause. General anodyne treatment is indicated. If produced by absorption from the surface of the skin, wash with antiseptic wash at the point of application of the cause; examine the bladder for foreign bodies and stones, give laxatives to the bowels; opium and hyoscyamus may be combined to allay sensibility; emulsion of olive oil and eggs beaten up together; diluents of linseed tea, or slippery elm bark effusions, or milk; avoid all diuretics; washing out of the bladder is good treatment, with a three or four per cent solution of boracic acid twice a day; in the male a catheter can be used; in the female it is easy to use, let it gravitate in, using a fountain syringe; while applying, if the bladder contracts, allow the wash to come out—don't try to force to hold it at the time. Keep the animal perfectly quiet. These Cystitis troubles may be produced with dirty catheters. During convalescence anti-acids are useful, as bicarbonate soda in very small doses.

DYSURIA.—Means painful passage of the urine, and on account of the pain there is little passed at a time; the cause usually is some obstruction—it may be a calculus (a small one) that lies at the bottom of the bladder, and when urinating floats up with the urine and often obstructs the passage; this is particularly so in old men. Stallions as they grow old suffer from enlargement of the prostate gland, which horsemen call the bean; this sometimes is so great as to press on the urethra, forming a clay-like collection which closes it. Other causes are thickening of the neck of the bladder from Cystitis or other inflammations, or of the bulbous portion of the urethra, Cancer of the penis, Tumor of the glands penis; foulness of the sheath often produces swelling and pressure on the penis, and so interrupts the flow of the urine; males may suffer from all these, but females not so often. In females, prolapsus of the uterus causes pressure and stops the flow; hardened feces may press down on the vagina. The urethra in the female is short and large; in the male it is long and small. Many of these disorders can be recognized by examination per rectum, but they are easily recognized by their symptoms.

Treatment.—Locate the cause; oftentimes that is the most difficult

part, the treatment will then depend upon the cause. Rational treatment is to remove the cause. In case of enlargement of the prostate gland in the stallion or dog, the old treatment was tincture of iodine to the peritoneum, and iodide potash long continued internally, given in small doses; but this is more or less injurious to the reproductive power of the stallion. Pass the catheter occasionally, and see that it is smooth, and clean, and well lubricated; it acts also as a sound; in bad cases it might be passed three times a day. In the human they often have to remove part of the prostate gland, which is a very serious operation. In case of the thickening of the neck of the bladder, give external treatment that will allay the irritability of the lining of the bladder—which is often due to the acid condition of the urine, from eating too much meat; in this case alkalies overcome the acid condition and relieve. Retire from stud work, according to the severity of the case. In foulness of sheath, wash with soap and water, and introduce wad of absorbent cotton dipped in carbolized oil—one-sixteenth oil; swab out once a day, and at each dressing bring penis down, pulling gently and slowly.

ISCHURIA.—Is suppression of the urine, or when there is none secreted, or inability to pass it when it is present. When the latter is the case, it is usually from Paralysis of the muscular coat of the bladder; they usually exist together. This condition usually exists when the horse is kept too long without giving a chance to urinate; some horses are peculiar as to how and when they do this, so never fail to humor them in their peculiarities in this respect; therefore when you notice colicky pains, switching the tail and restlessness, you can suspect the cause. Many horses dislike to urinate while down, so in case of Azoturia and horses in sling, the water should be drawn from them. When a horse is going to be swung, never forget to draw the water from him, or you may cause rupture of the bladder. When there is none secreted, as in *Purpura Hemorrhagica*, then it is the kidneys that are in fault.

Treatment.—If there is no urine secreted, diuretics and diffusible stimulants are indicated. If there is spasmodic contraction of the bladder, then anodynes are indicated—as hot water and belladonna. Try passing the catheter, smeared with the solid extract of belladonna, this will often reduce the constriction. If you are sure of it being Paralysis, give 1 dr. powdered *nux vomica* in the feed, night and morning, for a few days.

ENURESIS.—Incontinence of the urine, when the animal cannot retain the urine in the bladder; it dribbles away as it forms; usually due to Paralysis of the neck of the bladder; the sphincter muscle fails to contract, and the result of this is sometimes very painful, particularly in the mare—it scalds the legs as it dribbles down. In the male, the penis becomes paralyzed and hangs down. Enuresis means wetting the bed at night.

Treatment.—There is defective nervous power in the neck of the bladder, may say of all the bladder; hence nervous tonics are indicated, with local shocking, as dashing cold water on the peritoneum; this often resuscitates the waning power; often a gallon of cold water by the rectum produces a nervous shock; also electricity is good—this to the peritoneum. *Nux vomica* used continuously for a month, or two or three months, promotes the general health.

STRANGURY.—Indicates the passage of urine in drops, on account of

the terrible irritability of the lining of the bladder, of the muscular coat, and less of the mucous. The urine comes away every few minutes in drops, or in very small quantities. Apparently there is a hyperæsthesia of the lining of the bladder. The retention of the urine causes inflammation of the bladder, and this is generally irritated by some substance in the feed or in the medicine.

Treatment.—Must be towards allaying the irritability; so give anodynes—opium, belladonna, etc., and laxatives, oil with linseed tea to drink. Remove the cause.

URETHRITIS.—Inflammation of the lining of the urethra; may be from any of the causes that produced the inflammation in the bladder. There is an infectious disease of the urethra, which resembles Gonorrhœa in the human, but this is denied by some authors. If stallion copulates with mare suffering from Leucorrhœa, it is apt to produce Urethritis.

Treatment.—Is mild, soothing diuretics and stimulants in the form of copaiba, 1 drachm doses three times a day, or oil of sandalwood, same size doses, and suspend the horse's stud work. Of local injections would be very chary of using them, still you might, but they must be very mild; that is in case the trouble is very purulent. Rinse out first with a solution of bichloride mercury 1 to 2000; twenty-four hours after, with another solution 1 to 6000; this you can use once or twice a day for two or three days. That along with the internal treatment usually cures in from three to ten days. In all these cases relax the bowels with the medicines. It does not as a rule affect them further up than from 3 to 6 inches. If it does, it is due to irritating effect of gravel in bladder. If in stallion ascertain cause; retire for a week or two. Clean parts with soap and water three times a day, and at the same time syringe mild antiseptic into urethra gently, about $\frac{1}{2}$ oz. at a time. Solution of sulphate of zinc 2 grs. to aqua (blood heat) 1 oz., is best. Do not manipulate penis after injection.

RUPTURE OF THE BLADDER.—This occurs occasionally, but is very rare; more likely to occur in the human than in the lower animals, on account of holding their water too long. It is seen in cases of Azoturia, or in strain of the psoas muscles. Remember when you go to sling an animal to draw his water first, to avoid rupture of the bladder. In the human female this is more likely to occur than with a man, as they are more modest about this, and often when in company will hold their water all the time they are out—say boat riding, buggy riding, etc., so use commonsense, and if with a lady see that she is not kept over four hours without giving her some opportunity to urinate—you can find some excuse to leave her alone for a few minutes. It is always fatal.

EVERSION OF THE BLADDER.—This often protrudes through the vulva, appearing like a case of prolapsus or a polypus, and is often mistaken for these; can be told by the difference in the tissue. The lining of the bladder is covered with villi, and is velvety like; two openings can be seen, one of which is the ureter, from which the urine trickles.

TREATMENT.—With a round-headed probang about $\frac{3}{4}$ of an inch large, return the bladder to its proper position, using care not to puncture it. After you get it back, use anodynes—as chloral, or hyoscyamus, or opium to prevent straining; give a quart of linseed oil and anodyne injection (tr. opii diluted with carbolized oil). If necessary relax the

parts with chloroform, or anæsthetise the animal to complete insensibility.

CYSTIC CALCULI.—Stones in the bladder are formed mostly of carbonate of lime, some phosphate, and carbonate of other minerals. Due to bad drinking water, or as a result of hereditary tendency. They are often of enormous size; you recognize this by sudden interruption in the flow while urinating, and the horse is inclined to urinate more frequently than normal; will stand long time after urinating; he seems to dread the operation. In the mare it shows by hide-bound, staring coat; occasionally blood is passed. On testing the urine will find superabundance of carbonate; rectal and vaginal examinations will detect stones in the bladder.

CYSTIC CALCULUS.—Is when there is one well-formed stone; when there are a number of small stones it is called gravel; they indicate an alkaline condition of the urine. These stones irritate the bladder very much, and are likely to produce quite characteristic symptoms. Make a rectal or vaginal examination and you can find them readily. The symptoms that arouse your suspicion of their presence are—the horse making water too often; makes it every half hour or so; after he gets through he will strain, and remain in that position for some time. The mare squirts the urine out and dirties her tail; sometimes at the end of urinating will pass a little blood. At times the horse will be urinating very freely, when suddenly the flow will stop, due to the stone floating into the neck of the bladder—this is a good indication of the presence of these stones. Then in some very bad cases there is Sub Acute Cystitis, and the inflammation keeps on increasing till it amounts to a severe Acute Cystitis. The animal gets weak, there is languor, long staring coat, is unthrifty, great depression, finally fever, collapse and death. In dogs we have the most trouble from gravel; it floats down till it reaches the bone in the penis, where it becomes lodged, and the urethra expands on either end of the bone. If it remains there long it will cause suppuration and ulceration, and finally the stone will contact the bone, setting up Periostitis, and will become firmly adherent to the bone. In dogs, the black and tan fox terriers, and the Yorkshires seem the most liable to this trouble; sometimes the gravel shuts off the passage entirely. I have seen cases where the animal did not urinate for two weeks. The only treatment is to pass the catheter; this is often very difficult to do on account of the stone filling up the passage and becoming adherent to the bone. In cattle, males have a sigmoid flexure, and gravel often stops at that point and plugs up the urethra, and it becomes dilated above the stoppage.

Treatment.—Treat gravel therapeutically; use hydrochloric acid—it has a tendency to dissolve them; give the horse 1 dr. two or three times a day, freely diluted; the more freely the better the effect. It renders urine that was alkaline either neutral or acid. Acids dissolve alkalies, so carry far enough to make the urine acid; you can tell that by the use of litmus paper to test.

LITHOTOMY.—Is the removing of these stones by incision into the bladder.

LITHOTRITY.—Is breaking up the stones in the bladder, as they must be broken when they are very large, in order to remove them. In

the mare the operation is very easy—locate the stone per vagina, introduce the forceps into the vagina, then with the left hand in the vagina lift the bladder so you can catch the stone in the forceps, being careful not to include any of the mucous lining; turn your forceps around so as to tell if you have any included or not; draw out slowly, carefully, but strongly.

In the horse you must insert the catheter, and then clip off the hair and cut down onto the catheter; then withdraw, and with a probe-pointed bistoury make the opening about one and one-half inches long; introduce your forceps, and with the left hand in the rectum manipulate till you catch the stone and withdraw; when through with operation syringe out part with bichloride of mercury 1 to 1000. In the bull or ox cut down onto the place where the stone plugs up at the sigmoid flexure, that is about an inch or two from the scrotum. Treat these wounds in the urethra the same as simple wounds, and only stitch up the skin. The urine will drip out for two or three days, but do no harm; put on wet or dry antiseptic pack or iodoform gauze; good idea to change this when it becomes soaked; occasionally pass the catheter, smearing the end with belladonna—this allays the sensibility. After removing the stone it is good to rinse with a four per cent solution of boracic acid at blood heat, with a little tincture of opium added; this is to rinse out the bladder. Best to always cast in these operations, though it might do as well standing, in the mare.

DISEASES OF THE BRAIN AND NERVOUS SYSTEM.

Diseases of the brain and nervous system are not so common in the lower animals as in the human. The lower animals are less liable to fatal results from shocks, as from fright or operations; though these diseases are not entirely absent. They are divided into three classes—Cerebral, when applied to the brain; Spinal, to the cord; Peripheral, to the nerves; and there are certain phenomena peculiar to each. We recognize that the brain is affected when perception, volition, and the special sensations are altered; also when there is Paralysis of one whole side of the body; this is called Hemiplegia. When it exists in a transverse manner it is called Paraplegia. Retention or Incontinency of the urine denotes spinal diseases. The phenomenon due to the peripheral is when a circumscribed portion is affected—as a muscle or a group of muscles. We find on careful dissection of the medulla oblongata, that most of the nerve fibres cross over at this point; they originate at one side and cross over to the other, called decussation, but some run straight. On this account there is a peculiar phenomenon—injuries on one side of the brain produce Paralysis on the other side of the body. Injury to the gray substance affects the voluntary movement, that is of the motor nerves; injury to the medullary portion interferes with the automatic portion, that is sudden injuries particularly. The effects of sudden injuries are very noticeable, but slowly encroaching injuries are very puzzling in the effects they produce. The injury to the white substance of the brain interferes with the automatic functions, especially of the heart and blood vessels; injury to the base of the brain means death. Another phenomenon of diseases of this system is, that every affection produces either an increased functional activity or depression; in other words, any derangement of the brain and nervous system has a tendency to produce either

an increased functional activity or a depression. In fact, any derangement of the brain and nervous system has a tendency to produce either Hyperæsthesia or Paralysis. Injury to the cord we find interferes with the motor power, because the motor nerves run along through the outer part of the cord, while the sensory run through the center—this is the gray matter in the cord. Another phenomenon is that which is well marked—you may have extraordinary changes in the function and little or no morbid anatomy.

CEREBRAL CONGESTION—VERTIGO—MEGRIMS—STAGGERS—BLIND STAGGERS.—This is alteration or disturbance of the circulation. Vertigo means a hyperæmic condition of the brain, more or less sudden in its attacks, and is usually due to pressure on the large veins of the neck by ill-fitting harness; this interferes with the circulation of the blood to the brain. In some cases it may occur when the horse is not in harness, then it is usually due to plethoric condition of the animal, and is associated with torpidity of the liver and hepatic circulation, also derangement of the liver, and with the stomach in suspension of digestion, and with partial Paralysis of the pneumogastric nerve.

Semeiology.—These attacks of the brain are due to the peculiarity of the blood or to pressure on the neck; the horse will often stop, shake his head, ears will drop, becomes temporarily blind, twitching of the muscles of the head and neck, eyes protrude, breathing stertorous; often a few minutes' stop relieves, and the horse will go on; but in other cases he becomes excited, blind, will rear and plunge, the blood vessels of the head and neck will show dilated, eyes staring insensibly, nostrils dilated, and stertorous breathing. Sometimes the rearing and plunging remove the cause; other times he loses co-ordination and goes down in a heap, is insensible and may keep up a running or trotting motion involuntarily. The shock to the nervous system causes some sweating, and while down he will often froth at the mouth, but the fall usually removes the cause and he gradually recovers. Under these circumstances the old idea (the one nearly every one will suggest) is to bleed, but blood will not flow until after they begin to recover, and at the time of the fit the bleeding would be useless and there might be serious results from it; while lying down dash cold water in the face, that will produce a shock; but if there is none handy let him take his time; take off the harness and give plenty of air. After the fit is over, try to learn the cause of it. If plethora—lessen the feed and give purgatives. These attacks often come from stomach and liver troubles.

CEREBRAL ANÆMIA.—Is a bloodless condition of the brain, but doesn't apply particularly to the brain, which is never anæmic of itself. Anæmia is seen in ordinary fainting fits in the human; there is loss of motor and sensory power, and the face shows it by the pallor; in animals the mucous membrane is pallid. When there is Cerebral anæmia there will be a weak mind, as seen in nervous prostration from debility; that is from fevers, etc.

Treatment.—Should be rational; treat the general symptoms, to build up; nutrition for the body, and iron for the blood.

CEREBRAL EMBOLUS.—Is a clot in the brain or blood vessels of the brain; they become plugged by a clot which usually floats there and produces a Thrombotic condition of the vessel and Paralysis of all that

part of the brain supplied by that vessel. This is called Thrombotic Paralysis; this clot is usually formed from weak cardiac power or valvular insufficiency. Valvular diseases of the heart are particularly liable to produce ante-mortem clots.

Semeiology.—Stupor, weak-minded; pallor of mucous membrane; the stupor often runs into coma and death. This Thrombosis partly resembles softening of the brain.

APOPLEXY.—As applied to the brain means Cerebral hemorrhage. This is a disease known by the sudden loss of power, both sensory and motor. Hemorrhage occurs in one of three ways—first, in rupture of the blood vessel in the brain; second, we get the same result from a serous collection in the ventricle of the brain; the causes are either stomatic or idiopathic; as we see it in the horse the hemorrhage may occur in three ways or in three different parts of the brain, first, in the cerebral substance; second, in the ventricles of the brain, third, in the arachnoid space. The cause is usually Stomatitis in the horse; so the first and third are usually the forms.

Semeiology.—It acts suddenly always; he falls to the ground, froths at the mouth, the special senses are suspended, can't hear, taste, smell, or see. In severe cases death will result in from an hour up to eight or ten days; sometimes when the case is not severe the clot is absorbed and the horse recovers; but it is very slowly, and not desirable in the horse, as he is liable to go mad in any future disturbance.

Treatment.—It is not considered safe to bleed, as bleeding increases the local hemorrhage. Where the rupture has taken place, elevate the head, pack the head in ice, keep the rest of the body warm by clothing and friction, give stimulating enema, and inhalations of ammonia, hypodermic injections of atropine, alcohol, etc. Never give medicine by the mouth in this condition; it is liable to cause death by suffocation, by getting into the lungs.

PHRENTIS (CEREBRAL MENINGITIS).—Inflammation of the covering of the brain, also called Mad Staggers, Cephalitis, or Encephalitis. Cerebritis is inflammation of the brain substance. This exists in two forms—Acute and Chronic. Both forms are seen in the horse. It is not possible to draw the line between Meningitis and Cerebritis as in the human. Meningitis is usually due to idiopathic or traumatic influences. The idiopathic are, exposure, exhaustion, unhealthy influences, as the rays of the sun when very hot and long exposed, therefore it is more common in hot weather than in cold. There are various other causes that arise within the body, and no definite reason for them can be given. Both forms are sometimes due to Cerebro-Spinal Meningitis. The traumatic are those produced by blows on the head, either fracture or not; though of course the fracture would be liable by pressure on the brain substance, which is usually the case.

Semeiology.—There is marked Congestion of the mucous membrane where it is visible, especially the eye; this is due probably to its immediate connection with the brain, and also due to its size, being the second largest nerve in the body. There is muscular twitching and excitement of the animal; the twitching sometimes amounts to a spasm of the limb or of two limbs. These spasms sometimes involve the whole body, producing Cerebral Convulsions. This period of excitement is usually followed up by

depression, and it is greater than the normal condition, that is, there is an abnormal inactivity. In some cases it amounts to stupor or coma; but in Meningitis this stupor period is comparatively short, and the excitement returns. As it progresses the attacks come on oftener. There is a well-marked constitutional disturbance, the fever may be as high as 104 or 104½, pulse accelerated and inclined to be hard; animal is markedly delirious, even in the periods of stupor, therefore it is dangerous to get near him, and it is impossible to handle him in the ordinary way. After the fever has been running for a day or two the pupils of the eye are contracted, the eyes are bloodshot and staring; respiration is accelerated, he is restless and uneasy, and as the disease progresses the periods of excitement become more frequent, and he becomes wildly delirious, climbing over the manger. This desire to climb sometimes comes on during the first twenty-four hours. If from traumatic, usually it doesn't occur till the second or third day. Sometimes during the periods of climbing he may be attacked with convulsions. Spasms take place in the hind legs and throw him down, but he gets up and goes to climbing again. During stupor will often hang his head; almost inclined to fall, will stand with his face pressed against the wall, but this is less marked than in Cerebritis.

The symptoms of Meningitis are more violent than those of Cerebritis. When the period of excitement is subsiding and just as stupor comes on, he will be inclined to eat and will take a few mouthfuls and hold in his mouth till the stupor is on, when he will drop it all from his mouth. This period between the excitement and the stupor may last ten or twelve minutes. The form of death in these cases is Convulsions, finally collapse, and will lose the power of co-ordination, gets down and pounds himself terribly. Among the idiopathic causes there may be some disturbance of the cerebral circulation. The characteristics of Cerebritis are, that there is less fever, less excitement, the periods of stupor are more complete and longer continued, still there are Convulsions and delirium, but nothing like as severe as in Meningitis. This is because Meningitis is located in the gray matter, and Cerebritis in the white. In Cerebritis the animal will stand a good part of the time with the head braced against the wall or manger; appetite is usually lost, partly due to the fever and partly to the loss of sense. After a while, particularly in Meningitis, will lose power of co-ordination, goes down and is unable to get up, and the animal will lie prone and keep the legs going. During the comatose condition, especially of Cerebritis, the stupor can be broken by moving the legs in an unnatural position—as crossing them. Put your finger in the ear or eye and no resistance is offered. Death usually takes place in from forty-eight to one hundred hours, usually about the third day. It runs a very rapid course compared to the human; sometimes as quickly as forty-eight hours, but might be prolonged to five, six or ten days. The differential diagnosis between Stomach Staggers and Mad Staggers is quite simple—in Stomach Staggers there is no fever, no Congestion of the visible mucous membrane; eyes are not bloodshot, the stupor is continuous till the fermentation arouses him; this disease usually yields to treatment; while in Mad Staggers there is fever, Congestion of the visible mucous membrane, eyes bloodshot, (which is an important feature of the disease,) and there are alternating periods of stupor and of excitement; this

disease seldom yields to treatment. In regard to the differential symptoms between Cerebritis and Meningitis, in Meningitis there would be greater excitement and less stupor than in Cerebritis. In Meningitis there is an increase in functional activity, irritability and excitement as the inflammation extends more or less to the cortical portion, and then comes the stupor—before that there was only delirium. On the other hand, we see that in any trouble to the cortical portion there would be stupor, as in Cerebritis.

Treatment.—The fever is high, pulse strong; when not complicated with specific fevers, blood-letting is indicated—from a good size horse, four to six quarts is better than any other treatment; but if you have a specific fever, Cerebro-Spinal Meningitis, it would not be safe to bleed. It is good to purge whether you bleed or not; and in addition to aloes give diuretics—as potassium salts; allay the nervous sensibility, or rather the irritability, and of the heart also, by gelsemium, which is the best of all; or aconite, or belladonna, etc. Give the gelsemium freely, or you can give gelsemium and belladonna, or aconite and belladonna; and in bad cases with any other treatment, bromide of potash in liberal quantities with any of the other drugs, but if you give much of it give a smaller dose of the gelsemium. Belladonna is particularly indicated on account of its contracting the arterioles. Ice poultice is the proper thing for local treatment; keep packed in ice. It is very difficult to do much for the horse in this disease because he is irresponsibly dangerous, so don't get caught in a corner or in a narrow stall; but if you can get up to him apply the ice. Recovery is very rare, though the disease is not so rare; the causes are very obscure. In case of recovery, say after three weeks, you can apply cantharides blister to the head. Give three or four months' rest; don't work at all. Really, recoveries from this disease are not very desirable, because the animal is always liable to fits of delirium under any disturbance, and is dangerous.

You can't diagnose this disease with any degree of certainty. In autopsy the meninges are thickened, with adhesion here and there. You will find coagulated and organized exudate in the ventricles, particularly in the lateral, also in the sulci and other parts of the brain. In CERE-BRAL SOFTENING it is just the reverse; there is Softening of the brain; and the brain substance is altered in color, is softer, sometimes quite liquid, and is softened always, especially in spots; it looks like abscesses; the color varies from a pink to a dirty white. There have been cases where in autopsy nine-tenths of the brain was softened; that was from a long-continued disease. Many cases have been seen where the Cerebrum was partly destroyed, looked like pus. Causes of chronic Cerebritis are usually Acute or Subacute forms or attacks of Cerebritis, and the softening develops gradually without any previous attacks. Cerebral Softening is known among horsemen as dummy; they are all cases of Cerebral softening and are quite common. It is hard to assign any cause, but we think it comes from the acute or subacute attacks of Cerebritis, or from interrupted circulation in the brain; there may be some local Thrombus, and when softening begins from this cause it extends and finally terminates fatally. In the human it is frequently caused by long-continued use of alcoholic drinks.

Semeiology.—The symptoms are very marked, but require close

observation to detect them. The horse is more or less stupid, he seems to lack ambition and often staggers, is unsteady in his gait. You must look out for this in examining for soundness; mild excitement will rouse him for a time, and horse dealers take advantage of this and exercise him, using the whip, before he is to be examined. He looks stupid, is unsteady when backed out of the stall, will stub his toe and make false steps, especially in turning; his ears may be moving forward and back, and there is often an absence of expression in the countenance. Whisky or the whip will exercise him for the time being. To test dummy, see him backing out of stall or turn in stall. Lacks complete power of co-ordination. Staggers and wabbles a little. Put finger in ear and he wont mind it, others horses will. Put one foot across the other, and if he leaves it, it is another symptom.

Treatment.—Is useless.

INFLAMMATION OF THE SPINAL CORD.—This is divided into three classes or three heads, that is for description:

Myelitis or Spinitis, when the substance of the cord is affected. Spinal Meningitis, when the cord and coverings are complicated with cerebral troubles.—Myelitis and Spinal Meningitis are nearly inseparable, in the lower animals at least, and also less common than in the human, as they are less liable to syphilitic disease.

Etiology (of Myelitis).—Violence in the form of external injuries, disease of the bones of the vertebræ, and the inflammation extending to the cord; exposure to dampness and the extremes of temperature, especially when exhausted from overwork. In the majority of cases it arises from no assignable cause, it is very obscure; it comes on without any assignable or appreciable cause.

Semeiology.—When the meninges of the cord are first affected the first symptoms will be Tonic spasms of the limbs, usually the hind ones; this is probably because it affects the loins first, then extends forward. These spasms are often so severe as to jerk the horse off his feet and throw him down; he stamps spasmodically and involuntarily; when the spinal cord itself is first affected there is an absence of these Tonic spasms, and instead there is a loss of motor power. The first thing you will notice the hocks dip into each other, the toes turn out after about ten or fifteen hours; finally grows worse, will wobble in his gait, there is no spasm, no delirium. The inflammation in this case starts in the cord, while in Spinal Meningitis it comes on with spasms. During the progress of the Myelitis, motor Paralysis increases and finally becomes so bad that if you move him he will fall down, but if not moved will stand braced from twenty-four to forty-eight hours. In the case of Spinal Meningitis it only requires from twenty-four to forty-eight hours for the inflammation to extend to the cord, followed by a loss of motor power; so also in Myelitis, it takes about the same time for the inflammation to reach the covering, when there are muscular spasms. As the disease goes on the spasms become almost continuous, and the animal finally dies in from three to ten days; general average, five days. The pulse is hard and rapid, temperature usually from 102 to 104, respiration accelerated, more on account of the exercise due to the spasms; bowels irregular, mostly constipated, and sometimes paralyzed; urine scanty and what is passed contains abnormal ingredients, as albumen, etc. While lying and un-

able to rise, the expression is haggard and he is probably in great distress. There are chronic forms of both of these diseases, but especially in Spinitis (loss of motor power). In Chronic Meningitis they are excitable, the least bit of excitement affects them; there will be nervous twitching; some ascribe Stringhalt to it.

CEREBRO-SPINAL MENINGITIS.—It resembles the other two very much, with the exception that there are cerebral symptoms from the start. It is looked upon as being due to a germ, as a specific disease; it is some form of specific blood poisoning, but what the character is we don't know; we know that it occurs in badly ventilated, badly drained, badly crowded stables, most often found in street car stables where the air becomes vitiated, and causes various forms of diseases. In 1877, in the winter, it existed on the Atlantic sea coast as an Epizootic, especially in the large cities and as far north as Montreal. The mortality was very heavy; it ran a very definite course, with a period of incubation of from ten days to two weeks. The specific character of it was proven by introducing fresh horses among them and they at once became affected.

Etiology.—The poison has not yet been defined, but it floats in the air; it may be confined to a single stable, probably then due to some local cause, as from the water or drainage; it exists in low marshy districts. The blood poisoning produces serious pathological changes, which seem to be confined to the medulla oblongata.

Semeiology.—It takes two forms or degrees of severity—the mild form comes on something like Spinitis; languor, dullness, stupor, and paralysis of the hind parts. In course of from one to three days it creeps forward and involves the base of the brain; then there is often coma; of course before it reaches there the horse has gone down from Paralysis. Often the sensations remain after the motor power is lost; after a horse gets down with this trouble he may die in a few hours, or he may last a few days, according to the severity of the case. Many of these cases would yield to treatment, but the more severe ones, where the covering is affected, come on with delirium, Mad Staggers, Paralysis of the hind parts, and in severe cases there are spasms of the neck, and back, and loins, often followed by excessive relaxation, and then they go down and die in a comatose condition. There are Tonic spasms after volition has been lost. In the delirious stage they are frantic; they pound and bruise themselves, and keep up a trotting or running motion; the pulse is not much affected at first, but later gets strong and hard; temperature is sometimes raised, sometimes lowered, sometimes below 95 and $\frac{3}{4}$, and as high as 105, but more often 102 to $2\frac{1}{2}$. As the disease progresses the temperature falls below the normal, due to the nervous system being partially paralyzed. In this case the bowels are partly paralyzed and constipated, though in the early stage may be very loose, and the fæces passed involuntarily, due to the relaxing of the sphincter muscle of the anus. Urine is dark-colored and ropy from excessive mucous. The sphincter of the bladder often relaxes and urine is passed involuntarily, particularly in the mare; breathing is stertorous.

Prognosis.—Mild forms often terminate favorably; severe forms are usually fatal.

Post-Mortem.—Very little morbid anatomy, but the main of what

there is, is in the medulla oblongata; it is redder and congested and softened, but it takes an expert to see it.

Treatment.—Remove the animal to healthy quarters, give good ventilation and drainage, and good drinking water. Give full dose purgative; McEachran gave one 1 oz. of aloes; sometimes it wont work where the bowels are paralyzed; followed up with salines in the feed. Good plan to put in slings. In local treatment cold water along the spine is rational; some use hot water, others dry heat. This local treatment is doubtful, as it is a specific disease and the treatment should be for the blood. Solid or fluid extract of belladonna is good, also arsenic, quinine, or salol; and to reduce the supply of blood to the cord, give small repeated doses of ergot, belladonna solid ext., dose 1 dr. three to four times a day; atropine $\frac{1}{8}$ to $\frac{1}{4}$ gr. three or four times a day, hypodermically. Quinine can be given quite freely in dram doses every four hours; vegetable bitters can be given with it. If there is coma, give stimulating enema; Prof. McEachran gives potassium bromide, which allays nervous irritability; all depressants are contra-indicated. During the Epizootic in the East, T. S. Berry of Boston gave atropine 3 grs., arsenic 2 grs., mixed together, on the tongue three times a day, and no external applications. He claimed unexceptional success, while a doctor in Brooklyn tried all known remedies and the mortality with him was heavy. During the comatose condition give small doses of stimulating tonic, as iron; if they will eat, give soft food. Prof. Robertson recommends, after the acute symptoms have subsided, actual cautery and blisters along the superior spinal processes. After convalescence is well begun give potassium iodide with a stimulant. Where you have one horse affected in a stable, give prophylactic treatment separate from the other horses, and follow the hygienic rules spoken of.

EPILEPSY OR FITS.—The term fits is applied to a number of different troubles—as fits of Indigestion, Hysteria, etc.; but fits without modification mean Epileptic; these are convulsions of the system with delirium, and in bad cases, complete coma. It is liable to occur in any animal, none are exempt, but it is seen less often in the horse than in other animals. Probably the one most subject among the lower animals is the dog, because its nervous system is much more highly developed than any of the others; therefore next to the human comes the dog in these cases.

Etiology.—We find that anything that will seriously irritate the nervous system is liable to produce these fits—as inflammation of the cerebral structure, Tumors in the cranial cavity or in the brain, abscesses in the brain or on the surface of it, or lesion of the cranial bones, and reflected irritation from other parts of the body; for instance, worms in the intestines, dentition in all animals, particularly in children and puppies, sudden fright or sudden noises that cause fright, severe exposure to the sun, and often a brain complication, as Specific Fever, especially in the dog in canine Distemper. Fits exist in many cases without any local reason or morbid anatomy; in many cases there is a total absence of morbid anatomy, and the majority of epileptic fits occur without any visible disease of the brain or spinal cord.

Semeiology.—When the disease is not complicated with a Specific Fever, the first thing is the wild staring expression of the eyes. The dog, if standing or lying, will run; if running he will stop, throw up the

head, champ the jaws, froth at the mouth, will often yelp, and as insensibility comes over him he will throw himself or fall over backwards or to the side; jaws may champ for one half minute after; a chronic muscular spasm comes over the body. In the early part of this insensibility there is motion of the legs, which subsides as the Tonic spasm develops; then complete coma takes place. During the coma the sphincter muscles relax and there is an involuntary passage of fæces and of urine; this lasts a variable length of time, from one half to two or three minutes; then the fit and spasms subside; and consciousness slowly returns. In the course of three or four minutes more the animal is the same as before, but very depressed. Hunting dogs are often affected, but it lasts only a short time and seldom affects them; theirs is probably due to excitement. Where these fits are rapid and death occurs, it is usually while in the fit. In horses it is more often due to specific cause, as Tumor or Abscess on the brain; some special cause rather than that in the dog; the symptoms in the horse are the same as in the dog, with the addition of profuse sweating, and with the same results as in the dog. In man the face becomes purple, and there is hyperæmic condition of the head.

Treatment.—During the fit, treatment is useless, but if it lasts more than a minute or two—dash cold water in the face or use electricity to the back—anything that will produce a nervous shock, then cover up and let them be quiet. If in children, cold water does no good, give a hot bath quickly; after the fit is over study the cause and treat it; if from worms give vermifuge; if from teeth, as in puppies and children, instant relief is given by lancing the gums over the teeth. Your success will depend on the removal of the cause. Bromide potash given liberally may control the fit; if a setter pup six months old, give ten grs. in a little sweetened water three times a day. Leave a bottle with directions to give a teaspoonful three times a day, but if the fits come on, give one after each fit. Occasionally the potash loses its power to act, then change to bromide soda; belladonna is a very good remedy except in the dog, who is very easy to kill with this drug. After the fever subsides give tonics—iron, arsenic, etc., internally.

Prognosis.—Depends entirely on the cause; if simple and can be built up, will be favorable; but in bad cases it is unfavorable. The suspicious symptom in the horse is the inclination to shake his head as if bees were around him, and he may go down; this may be caused by increased circulation from exercise. If possible in such a case bathe his head in cold water; a short stop will be good also. Where predisposed from Tumors or Abscesses on the brain, looks half excited, stupid, and may work his ears like a jackass.

PARALYSIS OR PARESIS.—Is loss of power, both of motion and sensation, but one may occur without the other. It is spoken of as Sensory Paralysis when the sensations are paralyzed, and as Motor Paralysis when the power of motion is lost. It is divided into Hemiplegia and Paraplegia, according to the part involved. Paraplegia is the most common. it means paralysis of the body transversely of points, back of a certain point.

Etiology.—There are two varieties of causes—Centric and Reflex. Centric is what might be called direct, due to external injuries, perhaps severing of the cord, or anything that will produce pressure on the

cord—as fracture of the vertebræ, effusion on the cord as a result of any external injury. Reflex arises primarily from some other part of the body periphery to some of the nerves, and often follows as a sequel to some other disease, especially of blood contamination. As a result of the reflex class, Paraplegia develops in the late stages of Distemper in dogs, and after they have been making an apparently nice recovery, and in Nephritis in all kinds of females, especially in the bitch. This form of Paraplegia resists treatment very much: may occur from Indigestion, especially when due to over-feeding. Impaction of the rumen in cattle, and some forms of Colic in the horse, produced by Gastritis and different kinds of poison, are frequently accompanied by Paraplegia.

Semeiology.—There is partial or complete loss of power, usually of the motor power; whether it is complete loss of motor and sensory is according to the cause. If of Centric, there is loss of motor; if from the Reflex, there is loss also of the sensory, especially where there is blood contamination. This loss of power will be diagnostic in itself. There are few other symptoms; Constipation is usually present, as bowels may be paralyzed; urine may flow involuntarily; the animal may be perfectly rational, showing that many of the actions are not dependent upon the cord; and we see in these paralyzed cases that the circulation goes on just the same.

HEMIPLEGIA.—Is paralysis of one side of the body longitudinally; this division is often so complete as to include one side of the face; the other side remains healthy; this is common in the human, very rare in the lower animals. It develops from severe injuries and severe pressure on one side of the brain.

Treatment of all kinds of Paralysis.—Study the cause and remove it; treat the cause; there is no special treatment for Paralysis; give nerve stimulants. If from external injury, either hot or cold fomentations. Paraplegia following Distemper yields to treatment. If cause is direct use electricity, strychnine or atropine. Following Distemper in the dog give iron, and in addition to the strychnine give bromide potash two or three times a day; give nux vomica and bromide potash two or three times a day. Local counter-irritants are good in certain cases, but wait till the acute symptoms leave; may be done with cantharides, or for the dog, lunar caustic; for cattle, mustard; for the horse, actual cautery and cantharides. Hemiplegia—same treatment except applied to the head.

HYDROCEPHALUS.—As it applies to the adult, is a rather rare occurrence, but it does occur occasionally; it is frequently seen in the fetus, rendering parturition difficult or impossible till the head is crushed. As it occurs in the adult it is from an accumulation of serum in the lateral ventricles, usually the result of some local irritation or mild inflammation—this inflammation taking a subacute rather than an acute form, yet acute enough to have effusion.

Semeiology.—The symptoms are very similar to those of Cerebritis, but rather milder in character, the animal is more stupid, little or no excitement, and in that respect it shows its proof of pressure on the brain; but in the early stage there are fever and little irritability; these last a few days and are then followed by diminished sensibility; the stupor and insensibility keep on increasing with occasional epileptic fits, until it terminates in coma, then convulsions and death.

Special Pathology.—In autopsy, on opening the cranial cavity we notice the brain is altered in form; instead of there being a deep fissure between the hemispheres, this fissure is almost obliterated. In cutting down through the corpus callosum you find water in the ventricles, varying in quantity from 1 to 8 ozs., and on emptying the water out we find the septum lucidum broken down, making one cavity; the arachnoid is thickened and opaque, particularly over the cerebellum, and often studded with spots of inflammation or inflammatory deposit. The fluid in the ventricles is usually pale, thin, and watery, but sometimes quite turbid; the result is blood poisoning and death. You are apt to find effusion in the lateral ventricles, also between the cord and its covering.

Treatment.—Is usually unsatisfactory. In mild cases it may give way to iodide potash, iron, vegetable bitters, or mild counter-irritation externally; keep quiet, soft diet and long rest.

LOCOMOTOR ATAXIA.—This is technically described in the text books as *Tabes Spinalis*, or *Tabes Dorsalis*; in some as *Sclerosis* of the Cord; Dr. Hughes says it is also known as *Crick Back*; the English call it German horses, and *Partial Paralysis*. It is one of the most singular diseases ever met with. In its nature we find that it is an induration or Atrophy, or the two combined; at any rate it is a contraction and hardening of the columns of the cord. Usually in the horse it is the supero-lateral column; in the man postero-lateral; and occasionally in the antero-lateral, but that is rare. In the horse the infero-lateral is combined with the supero-lateral, but not often. Atrophy is usually applied to the cord, but I think it incorrect; there is a contraction of it, so *Sclerosis* is a better term. Sometimes it originates in the cerebellum and extends down the cord, but it usually starts in the loins in all animals—man and beast; but as far as we know it is confined to the horse and man. The columns of the cord that seem to be affected are those portions of the cord that convey the motor power, so it is the motor power that is affected, with little of the sensory. The cord when you examine it, is indurated.

Etiology.—The old theory was, that it occurred in old hard-worked horses that were neglected and abused—that being the predisposing cause; the exciting cause would be exposure, and was also looked upon as being hereditary. A stallion wabbling in his gait should never be used with the mare, as something out of the healthy will be transferred to the offspring. The more we study and the more experience we have, we come to the conclusion that these causes have no connection with it, but new ones don't seem to present themselves. In the human ninety per cent of it is thought to be due to Syphilis; some say it is all due to that, but the more liberal say different; we know it develops in some people who have not a trace of Syphilis. Undoubtedly it is a cause in many cases, but some of the cases are assignable to other causes. Horses and geldings have it as well as stallions; some have it that never covered a mare, and some mares have it that have never been bred—quite frequently this is so. In the human, women seldom have it; it seems to be confined to men entirely. In an autopsy on a mare, sections of the cord were sent to Dr. Billings and he found that the lesions were identical with those in the human—*Tabes Dorsalis*. He found *Thrombosis* of the nutrient blood vessels of the cord, and assigns as a cause in the horse, this *Thrombotic Paralysis*. If an embolism takes place in any blood vessel that supplies nutriment to the

cord, Atrophy and hardening of the cord would naturally follow. We find the capillaries in the center of the cord are minute, and they become dilated and ruptured, and the gray matter in the cord becomes lacerated and torn, and at the same time contraction of the cord takes place. Dr. Billings' theory is very plausible and in all probability it arises from defective cardiac power, and an ante-mortem clot forming in the aorta, some particles might float into some nutrient vessel. When it starts in the cord at all it invariably progresses; Dr. Hughes says it is a progressive disease, and continues until it produces death. If it can be due to Thrombosis in the horse, then it can be in the human, instead of Syphilis; though admitting some cases due to Syphilis. Where the stallion and mare have Syphilis they are invariably affected with this disease.

Semeiology.—It comes on slowly, especially in the horse; we notice the first thing the unsteady gait behind, and especially in turning quickly acts as if not having full control of the hind parts. If it originates in the cord in the loins, as it usually does, only the hind parts are affected at first, but it often starts in the cerebellum, then they wobble before and behind, that is when it starts in the cerebellum and medulla oblongata; there is also a squinting of the eyes, particularly as an evidence of Sclerosis of the cerebellum. In the horse we can't ascribe it to overwork, as the worst case I had occurred in an animal that had never worked at all; nor do I think exposure to storms a cause; I think Thrombosis the most possible. When the cerebellum is affected one side is more affected than the other, and the animal will walk in a circle, the size of the circle showing the severity of the case—the smaller the circle the more severe the case. The Paralysis increases continually, and usually there is an increase in the symptoms; as the disease progresses there is a wasting of the muscles of the hind parts, especially in an acute case. As the Paralysis goes forward there is an inclination to throw the weight on the fore legs, then the hind parts waste more rapidly. In bad cases there is more destruction of motor than of sensory power. In the horse we have no evidence of acute pain; in the human, they say at times there are shooting pains in the legs, also in the back; in the human, in the antero-lateral they can't advance their legs.

Morbid Anatomy.—When the cerebellum is affected it is hard fibrous instead of brain matter, also of the cord.

Treatment.—No encouragement; incurable; treatment useless so far as curing goes, and the prognosis must be unfavorable; but we give strychnine, electricity, bromine, iodine, iron or arsenic, and liberal diet with gentle exercise; this retards the disease, prolongs life, and adds to the comfort of the animal. Dr. Hughes agrees with Dr. Baker that firing in actual cautery along the back is recommended, but in his experience it did no good.

TETANUS (LOCKJAW).—This disease is described as a continuous rigid spasm of the muscles of the body, both voluntary and involuntary; a Tonic spasm that is continuous.

Etiology.—Dr. Baker refers you to page 144 of Dr. Senn's book on "Surgical Bacteriology," to prove that the disease is due to the Tetanus germ. This germ is drumstick shaped, with the spore in one end; it is found in some kinds of soil in gardens; in Europe it can be found in any garden soil; is found in street dust almost everywhere. This same germ

is found in discharges from the wound in a tetanic patient; also found in the nerve leading from the wound; they get in between the filaments, and in bad cases in the substance of the cord. This germ is anaerobic; the fact of this disease being due to a germ and its being anaerobic, explains why it was so difficult heretofore to understand it. It is found that Tetanus may follow even an abrasion, or a microscopical wound, while in very large, wide-open wounds exposed to the air, we seldom ever have it. The germ won't grow where there is free access for oxygen; it is more liable in the small wound that closes and excludes the air. More than one-half the cases of Tetanus come from slight nail pricks that hardly lame the animal. Nicolaier, 1884, was the first to discover the exogenous character of the disease; he found the germ in the earth, introduced it into the animal and produced Tetanus. Rosenbaugh found it in the discharge of wounds of tetanic patients. The identity of the two germs was demonstrated in Koch's laboratory, April tenth, 1887; they found the period of incubation to be from twenty-four hours to several weeks, very indefinite. If the wound doesn't appear on the outside it may be on the inside, so there are only traumatic causes recognized now—no idiopathic causes. All animals are subject to it, but it is more common in the horse than in all the other genii put together. Different parts of the body are affected. When the whole body is affected, it is called a case of ORTHOTONOS; when only the masseter muscles are affected, TRISMUS; when one side of the body is affected most, it is called TETANUS LATERALIS or PLEUROTHOTONOS; when the upper side is most affected, OPISTHOTONOS; when other parts of the body are affected it is called EMPROSTHOTONOS. TRISMUS is probably the most common when any exists alone, but ORTHOTONOS is the most common. There are some forms TETANUS that used to come under the head of idiopathic—as stiffness from colds, sore throat, etc., that cause stiffness, are known to have been from rheumatics. Parasites in the irritation they set up, assist in producing the disease, the germ getting into the tissue; the germs in the wound increase in numbers—then during a chemical process which they cause they are killed and also poison the animal as well; so when they don't exist in large numbers and the animal is strong and can stand it for several weeks, there is a chance for him to recover.

Semeiology.—The symptoms are clearly diagnostic from start to finish; the first thing that will be noticed is the contraction of the masseter muscles, they will be drawn around the mouth; he seems to have a little difficulty in eating, and while eating there is an enormous amount of saliva secreted, which flows out of the mouth. After a few hours the horse becomes excitable, nose is extended, facial muscles twitch, any little disturbance excites him; this will subside in a few minutes; the eyeballs seem to be retracted in the orbit, and look small. The membrana conjunctiva is liable to be raised constantly over the eyeball and makes jumps over it, and when the head is raised will cover the eyeball. An intelligent horseman will notice him getting stiff in his gait; he spraddles more behind. Trismus is usually well marked; after twenty-four or forty-eight hours the development seems to be quite gradual, other times violent, in which the case develops rapidly and dies. The spasms that were only in the masseter finally affect the whole body, that is the muscular tissues; muscles become hard to the touch, the dorsal, cervical

and gluteal muscles are most affected, tail elevated, it maintains that position and trembles, respiration hard drawn, nostrils dilated, ears stand like sticks, limbs stiff and straddled, locomotion very difficult, no elasticity of the joints, flanks tucked up, ribs are tightly drawn, due to the contraction of the intercostals, head is more elevated, neck often so contracted that it appears U shaped. As the pain becomes excruciating he sweats profusely, is very excitable, the spasms come on from time to time, and between times they relax, but not enough to cause much hope; the action is spasmodic; during this exasperation of the spasms the gluteal muscles, which are so strong at the hind legs, often shoot out behind like a goose flying, throws him off the floor and often he is unable to rise unless the muscles relax; but they generally never rise after going down, yet some may get up three or four times before finally staying down. A rat, loud talking, or strangers may excite the spasms; there is ropy saliva from the mouth, pulse at first is very little affected, but grows harder and smaller; the desire for food and water remains good, bowels inactive, peristaltic motion is interfered with, goes on in a very imperfect manner. The horse as a rule persistently stands, and where he can get up after being down it is a favorable sign; the spasms increase in frequency and severity; as he goes down, as he will long before he dies, he lies and struggles and finally dies. Death comes through one of two channels—first is contraction of the heart, causing syncope; second is contraction of the muscles of the throat, and he dies from Asphyxia. Death usually occurs in from two to ten days; severe cases in from four to five days; less severe in from five to six days, and mild cases in from eight to ten days. Mild cases are those in which the severe symptoms are absent, or in a milder form. Pulse at first is not affected, but grows hard and small as the spasms increase. When a spasm throws the horse down, or when he sweats profusely, there is little hope.

PROGNOSIS.—Where there is a little Trismus and they can eat a little, get up when they go down, and respiration is not affected, then it may be favorable, but if all the severe symptoms are present, then it is unfavorable. We find by experience that if he lives fifteen days he is liable to recover; if twenty days he is sure to get well. The French and Germans say if he lives thirteen days he will recover; if ten days he is liable to recover. The cases that used to be said were due to idiopathic, usually recovered; those due to traumatic died, but we know now they were not Tetanus when they were ascribed to idiopathic, and may recover now from nail pricks causing it. Among the causes are—tail-docking, castration, and amputation of the penis. Those cases that had tetanic spasms were not Tetanus, as from sunstroke, shorn sheep exposed to storm, over driving on a hot day, etc., but were rheumatic except in the overheated case—this was nervous trouble, probably due to Hyperæsthesia.

Treatment.—From the nature of the case it is easy to see there is no specific; the immediate cause of death is irritability of the nerves, producing these Tonic spasms and death, therefore rational treatment would be towards allaying this condition; that is keep comfortable as possible, bearing in mind that if he lives two weeks he is likely to recover, and if three weeks, he is sure to recover. Give hygienic treatment—pure air, quiet, moderately dark place, (the sunlight irritates,) alone,

free from the torment of other horses; if cold, clothe warmly; if hot weather, keep cool; no one but the doctor and attendant should see him—no loud talking, no clubbing, no spectators, can't lay too much stress on this. Give nourishment to keep up the strength; make linseed meal gruel (the round full seed) with boiling water—4 lbs. meal to a bucket of water, or about 2 gallons; keep this before him all the time, give nothing else to drink, and elevate it to the right height—he can't stoop down. Let him drink all he will of this—two or three buckets full if he wants it; salt a little to make it agreeable. This nourishes, relieves thirst, and also tends to loosen the bowels; purgatives are useless; if he needs anything else, give oats and bran mixed with boiling water. It is good practice to put the horse in slings, as it gives him one more chance of recovery; do it early so he will get used to it before the spasms get severe, when it will cause them at the start. Bear in mind that a horse can't recover on his side.

Medicinal Treatment.—Use such drugs as have a tendency to quiet the nervous system, as belladonna, prussic acid, morphine, ether, chloral hydrate, lobelia, gelsemium. The mixture we use is as follows:

R	Gelsemium fl. ex.	1 oz.
	Lobelia fl. ex.	1 oz.
	Belladonna fl. ex.	1 oz.
	Aqua ad. Q. S.	8 ozs.

Dose 1 oz. every three or four hours. If there is no Trismus, or only a little, give by the mouth, but if considerable Trismus, give per rectum—will do as well; if administered that way, have it about blood heat; cannabis indica is sometimes given, also carbolic acid. Recovery is very slow if at all; it takes from six to eight or ten weeks to get back to the normal condition. Give soft food, gentle exercise, good shelter, Hypodermic injections of morphine may be given two or three times a day, about 3 grs. to the dose. But don't pin your faith to any one drug; if one fails try another. One old time Vet. claimed good success from hypodermic injections of fl. ext. lobelia in 1 dr. doses under the skin as often as every three or four hours, but usually three or four times a day. The per cent of mortality is less in the horse than in man—about ninety per cent in the horse and about ninety-five per cent in the human die. Give local treatment and thorough antiseptic treatment. Another old Vet. cured many horses with prussic acid, 1 oz. to start with, diluted, and to drench with; after three or four hours another ounce, then another, if that doesn't fetch him, double the dose, and if that doesn't, double that; that is, if not in twenty-four hours, or till you bring him to his knees, then diminish the doses, probably to relax the spasm; often give 3 lbs. of the acid, this was ordinary commercial prussic acid, the strength of which is variable.

Post-Mortem.—To the close observer there is Congestion of the neurilemma of the nerve leading from the wound; the vessels of the spinal cord and brain are congested; usually there is an effusion in the arachnoid space. Bacteriologists say they find the germ in the nerve filaments and sometimes in the spinal cord.

Theory of Transfusion or Inoculation.—It has been proven that blood serum of a recovered case of Lockjaw will cure the most acute case of Lockjaw in its acute stage; this must be administered in doses of from four

to sixteen ozs. Some inject in small doses into the jugular; Dr. Billings says, into the peritoneal cavity. In regard to the length of time this must be obtained after recovery to be effected, some say it retains the quality indefinitely—I hardly think that long. The blood is drawn and let coagulate, the serum is drawn off, then warm that and inject into the peritoneal cavity.

CHOREA.—As usually seen it is an automatic convulsive motion of the muscles, usually confined to the voluntary muscles. It may occur in any animal, but we see it most common in the dog, next in the human, then the horse; in the dog it occurs oftener in the legs, while in the horse it occurs oftener in the neck and hind quarters, also in the shoulders. In the horse it arises as an original lesion, doesn't seem to follow any other disease, but this is probably more apparent than real. In the human and dog it almost invariably follows some other trouble; in the horse it occurs in an acute form that comes on suddenly, may be from Indigestion, particularly that which arises from over-feeding. In the dog it more often occurs as a complication of canine Distemper. Both in children and dogs it often occurs as the result of worms in the intestines. In children it sometimes develops on account of the mal nutrition of the body and inherited Syphilis; also in children and dogs from Indigestion. Prof. Robertson says there is an hereditary predisposition in many cases. In all these cases there is an excited condition of the peripheral nerve; we believe in some cases it is reflex, as when due to worms, or Indigestion. Where it occurs from some specific blood poisoning it is probably due to irritability of the whole nervous system.

Semeiology.—Usually it comes on rather suddenly, especially in Distemper, that is in the dog; sometimes it attacks them in a very acute form, more often in one fore leg; we notice he is lame for a day or two before any jerking takes place; he will carry it in front of himself in a curled-up manner. If you make him step on it by taking the other leg up, he will go down, but when there is jerking in it he can't bear any weight on it at all; then if it spreads it will do so rapidly to the other legs, then finally involves the whole body, and goes on till he dies from exhaustion. During these severe attacks the dog will whine, particularly if alone, as if in fear. Judging from the human there is no sharp acute pain, but there is general distress; jerking of the legs or other parts of the body is rhythmic, the animals lose control of the muscles involved. In bad cases this jerking is continuous night and day, asleep or awake; in mild cases it subsides during sleep. The mild cases don't seem to produce much constitutional disturbance. In the severe cases the animal becomes emaciated, especially the dog, and gets weak very rapidly. Some think the disease is transmissible, others think differently, but our experience in the dog is that it doesn't affect them for either field or stud work, they are as good as ever; Setters seem to be most liable to it. In the horse most of the best authors seem to be of the opinion that it is transmissible, so much so that they are condemned for breeding purposes.

The offspring of Choreic stallions are liable to develop the disease. Horsemen call it Shivers, as the shoulders, neck and other muscles twitch. In the stall he will sometimes show the affection by moving to one side, when he will lift the leg and put it out to the side in a peculiar manner,

or may be in backing out he may take a few steps all right, then can't get back any farther; there may be a shivering of the tail as well. In man or beast, Chorea is liable to become chronic, and all chronic cases are without exception incurable; some will only show symptoms while eating their oats, and on hanging the head the neck will twitch. The acute case, especially in the dog from Distemper, is usually unfavorable. If more than one leg is affected it generally proves fatal, as all the muscles become affected. In the horse, in the acute form with Indigestion from over-feeding and but little exercise, it is unfavorable. It is often noticed that there is a spasmodic jerking of one of the hind legs. A favorite place is the inferior and pectoral muscles in the neck.

Morbid Anatomy.—In most cases, post-mortem discloses no morbid anatomy that we can detect, but in long-standing and severe fatal cases we find there are many nerve lesions, as thickening of the arachnoid, effusion into the arachnoid space, etc., also hardening of the outer layer of the cord, and almost invariably vascular injection of the cord, also the central ganglia of the brain. In acute cases in the dog, due to specific blood poisoning, there is softening of the medulla oblongata.

Treatment.—Very unsatisfactory to treat, very difficult to do much for it, and in very severe cases it is absolutely incurable so far as we know. Mild cases in the dog and human do yield to treatment; in the horse in acute case accompanying surfeit, aloes are indicated, and it yields nicely to simple purgatives. After recovery increase the work and diminish the food, and give nerve tonics. Where due to worms in any young animal, it will yield to treatment; give vermifuges; get rid of the worms and then give tonics. When it occurs in Distemper in the violent form accompanying fever in dogs, it is almost invariably fatal; but if the Distemper yields to treatment, and the fever subsides and Chorea comes on afterwards, it takes a mild form and will yield to treatment, or it may become chronic and remain with the animal all the time; in such a case constitutional tonic treatment is about all that can be given to do any good, also liberal diet, correct hygiene, and avoid fatigue. For drugs, give iron, arsenic, zinc, copper, and in some cases very small doses of strychnine sometimes, other times it does harm, so you must experiment with small doses first. You can combine with these, vegetable bitters—as cinchona, gentian, etc., but of all drugs give arsenic in small doses to start with, and increase as continued; give it a long time—three or four months. Dr. Ellingwood claims he has had much success with exalgine in the human. Give three times a day—1 grain dose first day, two grain dose next day, three grain dose third day. In all cases in the dog where they whine, you can relieve that a good deal by combining a mineral tonic with a vegetable. Setters, say puppies six months' old, give 2 grs. valerianate zinc every three or four hours; for one year old give 4 grs. every four hours, and in addition to this, if valuable puppy suffering from Distemper and getting the Chorea, there is great depression and prostration—they need a stimulant; give valerianate of ammonia in about the same size doses, but you can give a little larger dose than of the zinc. Nitrate of silver in bread pills is very good, give for a week, then alternate with sulph. copper or arsenic tonic; also doses of electricity gently, not in shocks.

TUMORS OF THE BRAIN IN HORSES.—On account of the prevalence,

and troubles in court, you are liable to be called into court as an expert. We find in post-mortem on the horse that died suddenly, that he has a Tumor in the brain; it is usually caseous, but is sometimes osseous, sometimes cartilaginous. The caseous formation we suppose arises from coagulation of the effusion into the lateral ventricles, where they are usually found, probably due to some mild attack of Cerebritis. In the choroid plexus where they seem more liable to originate, they sometimes grow as large as a hen's egg, may be one in each ventricle, or may be confined to one; sometimes they produce pressure on the brain, and the animal may be taken with Epileptic fit any time. Sometimes they are osseous; they grow down from the cranial bones—and also produce pressure on the brain with the same results; caseous Tumors may sometimes become osseous. Horse may be unsteady in gait, become afraid, stop, appear wild and insensible for a minute or two; in the stable he may stand with the head hanging, or to one side as if with headache. Osseous Tumors occur on the outside of the dura mater; when the Tumors are forming they press down into the convolutions. The pia mater is liable to be affected as well as the dura mater. Sometimes these Tumors are hard and ivory-like. The point is, they can't be diagnosed during life, and are usually slow in growing, so when you make an autopsy you are to judge the time they took in forming, so as to be able to give testimony; the caseous might take from six months to two years to form, the osseous from four to six or eight weeks to develop; the harder they are the longer time in forming. There may be a softening around these Tumors.

LOUPING-ILL OR TREMBLING.—Is a form of inflammation of the spinal cord, and doesn't differ very much from Spinitis in the horse; it usually follows shearing of sheep and being exposed to storms. In sheep it is a Trembling—probably one form of Chorea.

Symptoms.—Trembling of the hind parts, rapid pulse, grinding of teeth, twitching of the muscles at intervals; often become emaciated rapidly; is generally fatal.

Treatment.—Bromide of potash and nux vomica; give good shelter.

DISEASES OF THE REPRODUCTIVE SYSTEM.

In the male the organs of the system are penis, prostate glands and testicles; in the female, vulva, vagina, uterus, fallopian tubes, and ovaries. The diseases of this class are not so common in the lower animals as in the human, because there is not as much prostitution. As a rule the lower animals never copulate except for the purpose of reproduction, but that is not the case with the human; over indulgence is a cause of diseases. Prof. Williams says the diseases of this system in the lower animals are due to inflammation of the mucous membrane, Catarrh, general debility, and Tumors.

Pox.—Is divided into two classes—Simple and Malignant. Simple Pox is characterized by little phlyctenular eruptions. Malignant (Virulent) Pox seldom or never occurs; this is known as Equine Syphilis, and because of its originating in Arabia it is often called Dourine. Simple Pox is frequently seen with Urethritis, which resembles Gonorrhœa in the human and is contagious.

Etiology.—From too frequent copulation in the male, and shows it-

self in little blisters on the glans penis and on the body of the penis; sometimes there is swelling of the glans penis and of the sheath. It would never occur in the female from too frequent copulation, because one heat would not last long enough, but it may in the stallion, though not until he had been serving five or six times a day for some weeks, then he may get it from a mare having Leucorrhœa. The catarrhal discharge in the vagina of the mare may produce Simple Pox in the male. In the female it usually arises from having been served by a stallion that had it, proving that it is an infectious disease. It usually manifests itself in the mare by considerable tumefaction in the vulva; little vessels crop out and discharge fluid and heal, and fresh ones appear and go through the same course, each crop lasting two or three days. This blister is most common on the inside of the lip, extending in a few inches, sometimes deeply in the vagina. It seems to poison the mare more than the male; vulva swells four or five times natural size, but it runs a benign course; that is true in both sexes. It will terminate in resolution spontaneously, that is without treatment; it takes about two or three weeks if copulation is suspended, but if copulation is continued it may be continued indefinitely and grow worse, with an unfavorable termination; but usually from two to three weeks are all that is necessary to cure it. In this there is no Chancre, but in the Malignant Pox there are Chancres, which are of two kinds—the soft and the hard, and resemble those of the human. The same germ in the hard is the Micrococci, in the soft is Bacilli. There is no choice in the diseases produced by either of these; the disease is infectious, but is probably only gotten by copulation; it may be given by the stallion to the mare, or by the mare to the stallion. In the human these Chancres are not confined to the genital organs, but may be found in the mouth, under the eyelids, or in almost any mucous membrane, usually brought there by the hands in dirty habits. It may be transferred to others when on the lip by kissing.

Treatment.—Retire for about two weeks; give dose of purgative medicines followed with salines and diuretics. Hyposulphite of soda, acetate or nitrate of potash, give soft feed.

Local Treatment.—Soap and water and antiseptic lotion, such as acetate of lead $\frac{1}{2}$ oz. to 1 pint of water, and sulphate of zinc 1 dram to pint of water. Use one of these a couple of days, then switch off and use the other. Apply three times daily.

History of Dourine Malignant Pox.—First history of its being recognized was in the stud of an Eastern magnate in 1796; next record was in Hanover in 1817, and in Poland also about that time or soon after; records of great losses by it in Poland between 1830 and 1840. In 1821 it entered Austria, particularly Hungary and Bohemia; from 1859 to 1862 they prescribed sanitary measures against it there, and in 1840 the Prussian government did the same. It entered Switzerland in 1830, Italy in 1836, Russia in 1843, and a year or so later it entered Algiers and Syria. England and Belgium are the only European countries that have been exempt from it. It entered France between 1820 and 1840. In May 1886 it was discovered by Dr. W. L. Williams in DeWitt county, Illinois. He was a Vet. of Bloomington, this State, and he reported to the State Live Stock Commissioners that it was infectious. In 1887 they took hold of it, and a party (of whom Dr. Baker was one) dis-

covered that it had probably come from an imported French percheron, which was branded under the mane with the French government stamp for this disease—the letter D showing it had been condemned for breeding by that government. Means were taken to stamp it out; the State gave horse owners the choice to have any horse so affected destroyed and receive the value of it, or to keep it in perpetual quarantine as far as breeding was concerned. It finally got out of the State, and is now in the West and Northwest, known to be in Nebraska and Montana.

This disease, tradition tells us, originated from copulation of syphilitic Arabs with the female ass. Tanhoffer, after making thorough examination, says the virus lies in the Micrococci; these germs may be found in the vaginal secretions and semen, in the spinal liquid and in the roots of the peripheral nerves, especially the ischiatic, and in bad cases in the blood. Some authorities say the disease is hereditary. Some scientists disbelieve the facts as related from tradition, that it came from the human originally, but everything seems to point to that as the most sure cause.

Semeiology.—According to the virulence of the attack, it may or may not present external lesions, and in a well-marked case—one that will cause death—it would first produce swelling of the vulva and mammary glands, and constitutional disturbances with considerable swelling and fever and rapid emaciation; in three or four days you will notice a wobble in the hind parts; this wobble, which is found to be a progressive Paralysis, increases and the legs of the horse swell very large and become weak; there is a purulent discharge from the nose and eyes, and finally a general Marasmus sets in and he dies. A severe acute case runs this course in from two to six months, or may hang on two or three years. In acute cases animal loses appetite; in subacute he does not. We find in both male and female in an acute case, and to a limited extent in a subacute case, patches of depigmentation of the skin, which leave a white spot after—in the male on the penis, in the female on the flanks, escutcheon, under the tail, over the elbow, and in the male on the testicles; this occurs more in the mare, in the cases we see. The coat during this time becomes long and staring; patches of Ecchymosis appear on the visible mucous membrane. In mild cases where they appear to recover when off stud work, they must be looked upon with suspicion, but in France and Germany it reappeared again when copulation took place, after two or three years' rest from stud work. It is a well-known fact that mares affected with it will usually fail to conceive, or if they do conceive they are likely to abort in perhaps from three to six weeks or three months. If she does by good luck carry to the full time the young will probably be delivered dead; if not will soon die afterwards. Foals of affected mares seldom ever grow up; this is different in the human, as children grow up with all the troubles of syphilitic parents. A syphilitic stallion is usually no good, will get no colts, though he can serve a mare. Diseases of the genital organs don't usually interfere with copulation—in fact, it seems to increase the desire for it, especially in the human.

Treatment.—In bad cases it is well to destroy the animal; in mild cases suspend stud work and give strong tonics. Stallions should be castrated as they are not fit for stud work any more; the mare may be kept

in quarantine. Give iron and arsenic. Acute cases are helped by meat fibrin, which you can get by whipping fresh blood, or by making soup of it and drenching, but it is not worth the trouble for these animals. This is a general case of Locomotor Ataxia, and the lesion is exactly the same as in the human when due to Syphilis. There is seldom or never any discharge from the male, also true in the human. Simple Pox produces great local irritation. In the mare, sponge out the parts with a four per cent solution of boracic acid and 1 dr. fl. ext. hydrastis to one pint of water; the same may be applied in the male to the glans penis. If severe, syringe with bichloride mercury 1 to 2000, next day 1 to 4000, next day 1 to 8000; continue this three or four days, then it is well to use an astringent—as sulphate zinc 1 gr. to 1 oz. water—twice a day if the discharge is profuse; after three or four days make it 2 grs. to the ounce, and in addition give oil of sandalwood, dose 1 dr. three times a day, for from three to ten days; the same will do for Gonorrhœa in the human. For Pox in the human give iodide of potash in doses of from five to six grs. as done at Hot Springs; the usual dose ordinarily is from two to ten grs.

URETHRITIS.—As a disease of the reproductive organs instead of the urinary as known, resembles Gonorrhœa in the human. We are inclined to believe that it is a rare disease in the lower animals, but if there is enough poison in the vagina of the female to produce Simple Pox, then there must be enough to produce Urethritis. But if there is a germ it has never been isolated; the germ of infectious Urethritis in the human has been; it was discovered by Neisser, he found that the germ was a Micrococci, and on account of it having formed in the disease he called it Gonococcus because it produced Gonorrhœa. Associated with Simple Pox we quite frequently have a catarrhal discharge from the stallion the same as we have from the vagina in the mare, but it seems to stop if stud work is stopped, while Gonorrhœa will not. It doesn't seem to become cured spontaneously, but runs on from week to week. Urethritis as a disease of the urinary organs may occur in any animal, may be from the too free use of cantharides, etc., which produces inflammation in the lining of the urethra. In Urethritis there is an acid condition of the urine that scalds the urethra, or there is some catarrhal discharge in the mare that contains some irritating germ, or else it is a specific disease. The fact that it terminates spontaneously if stud work is suspended, is no proof that it is not infectious, for the same thing will occur in Simple Pox. In the human, Urethritis or Gonorrhœa is usually malignant, that is, it is inclined to keep on indefinitely and produce serious constitutional disturbances, and if let run on it may extend up the urethra to the bladder and cause Acute Cystitis.

Semeiology.—We find in Acute Urethritis, particularly in the stallion, there is painful micturition; we notice the horse passes his urine frequently and with pain; there may be a catarrhal discharge from the urethra, and there is tumefaction and Congestion of the visible mucous membrane at the end of the penis. In females we frequently see tumefaction of the vulva and lining of the vagina, also Congestion in the male on the glans penis as well as in the end of the urethra; frequently in both cases it extends to the bladder and causes Acute Cystitis. In the human this corresponding disease is very infectious, and is not confined to the urethra, but may be transferred to any part of the body, producing

serious lesion; may be in the mouth, eyes, etc., and have catarrhal discharge from them. It is so infectious that copulation is not the only way it can be taken; the mucous membrane coming in contact with any of the germs may be inoculated with the disease; children often get it from sleeping with parents having it; may be seen in their eyes or mouths, where they carry it with their fingers. In the human it always starts in the end of the penis, on the mucous membrane; if it runs on to Cystitis and is then let run on, the poison may become absorbed and produce serious results.

BULL BURNT.—Is similar to Urethritis, but affects the covering of the penis rather than the urethra. It is usually gotten by too frequent copulation; of course if the cow has catarrhal discharges it is more likely for the bull to get it.

BURNT DOG.—Dogs frequently get foulness of the sheath from an accumulation of natural secretion under the sheath same as under the foreskin in man; the lining of the sheath and a portion of the penis become inflamed, which produces a catarrhal discharge that can be seen on the end of the penis; there is no Urethritis, but inflammation of the mucous membrane lining the sheath and the penis.

Treatment For Urethritis.—In the horse very mild treatment and stopping stud work are often all that is necessary; give soft food and a little bicarbonate of soda in the drinking water; or prepared chalk or lime water; it is an acid condition, and alkalies cure it; acids increase it. Give linseed tea to drink, and if you wish to do more, give 1 dr. sandalwood three times a day, usually for three or four days. If it is persistent give local injection; if you suspect any specific character, use bichloride mercury, or carbolate or sulphate of zinc; if you use these don't drive up far—about four inches, as this is too strong to go to the bladder (it would cause Cystitis of itself); in the human two inches is far enough back. In man an ulceration often occurs in the urethra; about the size of a pea, it is Tumor like; in such a case use a stronger wash, as bichloride mercury 1 to 2000, four, five, or six times, then change to sulphate zinc 1 gr. to the ounce, then 2 grs. to the oz. If very painful add a little cocaine, and at the same time give oil of sandalwood in from five to twenty drops three times a day—usual dose is ten drops. In mares the vagina may be sponged out, using absorbent cotton or gauze. Never tie a cloth over the head of the penis, but instead put some absorbent cotton under the foreskin and change this two or three times a day; never tie anything around the penis, as it is liable to cause gangrene. A good internal remedy is *hydrastis canadensis*, and if combined with sulphate zinc makes a good local application.

Treatment.—For Bull Burnt, also Burnt Dog, use acetate of lead two, three, or four drs. to the pint, and shoot up into the sheath, hold there for a while and work it all around, first washing out the parts with castile soap. Usually one injection is sufficient to cure a dog, but for a bull a few injections are necessary, and retire him from stud work.

STRICTURE.—Some think this is due to too strong lotions or medicine, but it is produced in the urethra the same as the others—by inflammation of the urethra. Inflammation has a tendency to produce proliferation and thickening of the parts, so as a result we get stricture; of course if you use a caustic it assists in causing severe inflammation.

This disease (Urethritis) can't be cured in four or five days, it is more likely to run ten or fifteen days; but as too severe treatment may cause stricture, mild treatment is the best.

PHIMOSIS.—Is inability of the male to extend the penis.

Etiology.—It may be from a contraction of the prepuce, swelling of the sheath obstructing the passage; this may be produced in various ways—kicks from other horses, kicks from a groom; by a germ; accidental wounds of any kind; stings of insects, œdema of the sheath, or following Castration; then there are other obstructions—warts and other Tumors, or Cancers; sometimes they occur on the glans penis, sometimes in the form of Polypus.

Treatment.—Find the cause and remove it; about the only special treatment is in the contraction of the prepuce; if it is congenital, introduce a probe-pointed bistoury and slit down about $\frac{1}{2}$ or $\frac{3}{4}$ inch; in case of swelling of the sheath bathe freely with hot water. If from anæmia give iron. Some horses urinate in the sheath without extending the penis, producing a scalding of the skin; they probably don't know that they can extend it. Wash out the sheath, oil it and work the penis down for a few days, then he will usually do it all right.

PARAPHIMOSIS.—Is the reverse of Phimosis; the penis is out and can't be retracted.

Etiology.—It may come from a weakened condition of the animal in general, or from a weakened condition of the penis; may be caused by accidental injuries while serving the mare, often by the mare kicking the stallion on the penis—as some mares get very vicious; or it may be he injures the penis with his own feet; may be from swelling of the glans penis from some cause, and as the sheath swells the penis is forced out—this sometimes follows Castration; anything that prevents him withdrawing the penis, and the longer it is out the more it swells, sometimes it becomes an enormous size, may be six, seven, or nine inches in diameter. Swells mostly on the dorsal side, the covering becomes tense and glistening, sometimes gangrenous; such a severe case is usually due to some local irritation. Paralysis of the penis may be a cause; the penis hangs pendulous and limp, and will not swell if there is no other disease of it; micturition is not interfered with in any case, no matter how bad.

Treatment.—It is usually considered good practice, when there is great tumefaction, to scarify it and then use hot water, which causes hemorrhage to be free; if very acute, scarify freely and bathe liberally; after bleeding freely increase the heat of the water, then suspend the penis quite firmly against the belly with quite hard pressure; best to put a piece of shingle or pasteboard underneath so as to be smooth under the penis. Considerable hand rubbing and manipulation will do it good. Diuretics are indicated, internally. According to the cause there may be special treatment required. If there seems to be Paralysis, give to a horse of about 1100 lbs. 1 dr. of nux vomica, night and morning—the powdered drug. In case of Paralysis of the penis, that cannot be overcome—amputation must be resorted to. Bear in mind that the tissues of the penis are spongy, no well-defined blood vessels, but bleeds from the capillaries; that is the only difficult part—to prevent hemorrhage, and the more so if the penis is œdemic. The usual plan is to bandage so tight as to prevent hemorrhage, then cut off the penis

below the bandage; cut in a sloping manner, leaving the urethra beyond the end of the penis about $\frac{1}{4}$ inch. After removing, sear the parts thoroughly with actual cautery, more than any other part of the body would have to be seared. The bandage usually comes off in fifteen or eighteen hours, but if it doesn't, I take it off then; by that time the parts have swollen enough to prevent hemorrhage. In case of hemorrhage you can't draw down the penis, so insert into the sheath a sponge with a solution of iron or other styptic.

After Treatment.—The same as for a simple wound. If it is a stallion castrate him at the same time, and if the irritation should cause an erection have a man to dash cold water on it, that is usually sufficient; give a mild laxative and soft feed; when the scab comes off and the penis is healing, use white lotion.

DROPSY OF THE OVARIES.—Associated with it there is Congestion of the ovaries, at least in most cases, so you can assume that associated with the Dropsy there is chronic Congestion probably due to some disturbance in the circulation of the ovaries. It is comparatively rare in the females of the lower animals as compared to the human, still it is very common in old cows. When the dropsy is extensive they cannot breed from the ovary affected; but it may be that only a portion of the ovary is affected, or it may be one or both of them, but they breed from the unaffected portions; in case they are both affected then they will not breed.

Symptoms.—Where we suppose there is chronic Congestion, the female is nearly always in heat to a limited extent, that is a cow will ride others, racing and bellowing, sometimes will take the bull, but in most cases will not; but if she does take the bull she won't breed, as it is not a natural heat. These animals seem to change their form in time and become more masculine in looks; they don't make good breeders or good feeders, that is if you wish to fatten them; in that case they must be spayed. If you wish to breed them shut them up and give a purgative, and when she comes in heat let her be served with a young bull. These conditions are seen mostly in fancy well-bred, pampered animals; they are known as Bullers.

HYDROMETRA (DROPSY OF THE WOMB).—The mixture that fills the womb is a mixture of serum, lymph, and broken-down pus. It is the result of subacute, long-continued inflammation. Acute inflammation may produce it; but is more likely to cause death before that occurs. It may follow parturition, or may occur without any assignable cause.

Semeiology.—There is more or less staggering gait; it seems to produce pressure on the spinal cord. In the bitch, the hind parts seem to be paralyzed; in the cow, she staggers and can't turn or back, and they get very large as if pregnant; the os uteri is found to be closed as in pregnancy, but by rectal examination you fail to find any fœtus, and outside you fail to hear the fœtal heart.

Treatment.—If you are sure of your diagnosis, open the os uteri with one finger, then two, and so on till you get your hand in, then empty the womb; wash out with a solution of boracic acid—a three or four per cent solution, may add a little hydrastin. If you can pump in and out again, as with an Allen pump, it is well to use carbolic acid or zinc; they must be pumped out, but the boracic acid need not, it will

stay till it flows out. In addition give tonics and liberal diet; arsenic, iron, oats, bran, etc.

HYDROCELE, ORCHITIS, WATER SEED, DROPSY OF THE TESTICLES.—This is seen more in stallions than in bulls, dogs, rams, or goats. The cause is often very obscure; no assignable cause can be given for it. Other times it is due to exposure, to storms, or to external violence.

Symptoms.—The testicle swells, it may be one or both; it may be in the body of it or in the outside between the two; sometimes it seems to run down the scrotum from the belly, dilating the sack. When it occurs in the body of the testicle, it is usually fatal to that testicle; in that case it is more likely due to external violence, and the testicle must be lost if severe. When it is outside of the testicle and the testicle not injured, the serum can be drawn off with trocar and cannula. If the effusion is slight you can often cause it to be absorbed; never use surgery where there is no need of it. To cause to absorb, give small doses of iodide of potash about $\frac{1}{2}$ to 1 dr. night and morning, for a week or 10 days, but don't give too much, as it is liable to injure the testicles. Give soft food and gentle exercise, and put scrotum in a suspensory to do away with the pressure of its own weight. When it is in the testicle itself, bathe with warm water for an hour, then use a solution of acetate lead $\frac{1}{2}$ oz. to the pint. Give iodide potash and quinine, and put in suspensory. If the hot water doesn't do good, then try cold instead; some use the hot water first, then change to the cold, or use a freezing lotion—as muriate ammonia 1 oz., nitrate potash 1 oz., to quart of water. You can apply this two or three times a day; and use a suspensory. In case this fails and the testicle is very large, and you are certain it is the testicle itself that is affected, insert your trocar and cannula right into the body of the testicle and drain off. The best thing to do is to remove the testicle, but for the sake of looks in stud work it is well to try to save it, though it will only be for looks. But if this fails, then castrate him; he will still be good with the one left.

Treatment.—In treating, it will be necessary to lay the stallion up for a time, so give him a purgative and lessen his food. Wherever there is a tendency to this trouble, the best thing to prevent it is the use of a suspensory; and especially if they are very large naturally. Dr. Withers says all men should wear them, and that many who have weak backs would be relieved by their use. When anything is wrong with the testicles, always use a suspensory.

NYMPHOMANIA (CHRONIC CONGESTION OF CLITORIS).—Means an excess of animal passion in the female.

SATYRIASIS.—Excess of animal passion in the male; ancient mythology has it that Satyrs used to frequent streams or the banks rather, and wait until the nymphs, which were half women and half fish, came out of the water, and then rape them; the Satyr was half man and half beast; they were also called the Woodland-bucks. This disease is more common in the human male than in the lower animals, though males of all animals are always ready on opportunity. I heard on good authority, at least professed truth, that a man had been there fifteen times in one night.

Females suffering from Nymphomania are the same; they are in heat all the time, and a cow will take the bull at any time when this way, so

will the mare, but as a rule they don't breed. They differ from the bul-
lers, which don't want the bull though riding other cows. This disease
is more common in the cow than in the mare or in bitches, but in the
human female it is about the same as the cow.

Etiology.—Due to luxurious living, and is worse if they have gentle
exercise; it is more common in the human among the higher class because
of less work and high living, but as a rule they don't breed. It is an
old saying, that a poor man's cow and a poor man's wife will conceive
and won't abort, while a rich man's cow and a rich man's wife won't
conceive, and if they do will abort. Fact is, that a poor man's wife may
hang over a tub all day, and then conceive if he gets within gunshot dis-
tance of her.

Treatment.—Change the hygiene; sometimes it is due to disease of
the clitoris, it may be cancerous; this may be cured by amputation of the
clitoris, which will often control the passions; do not keep in too warm
stables. Males should be put to harder work—there is nothing so good
for this as fatiguing work; many a stallion has been ruined by leaving
him in the stable idle when the owner thought he was taking good
care of him; he had better have been working, as he may have erections
constantly and finally practice masturbation. There is no medicine re-
quired except purgatives.

HYSTERIA.—This is an excessively nervous condition, seen in females
only; the whole body is in an hyperæsthetic condition. It usually sets
in with the period of œstrum, sometimes continues with it, other times
it subsides, unless they die, as some young heifers do; old cows seldom die
from it. In the mare it is seen when about five or six years old; they
develop spasms similar to those of Tetanus, but not continous; they re-
lax, then Clonic spasm comes on again. They often become wildly de-
lirious, striking and biting; the spasms are often so bad as to throw them
off their feet. Still the spasm can be called tetanic, and along with it is
delirium. This is well marked, particularly in women advanced in years,
and especially about the period of the stoppage of menstruation. This
Hysteria sometimes proves fatal; in young girls, if they catch cold
during the menstrual period, at about the age of fifteen or sixteen, they
may become temporarily insane and continue so for two or three months.
This disease is common among women; mares are likely to die during
this disease, from syncope; the heart contracts and they die before it re-
laxes. During these attacks the temperature runs very high; we had a
case here in the school a few years ago in which the temperature could
not be taken—it ran up as high as the thermometer registered. It was a
heifer, and she died in one of the spasms. Women under these condi-
tions often lose their senses for a time and make unreasonable demands,
so men should be kind and not find fault with them, as they are irrespon-
sible for their acts.

Treatment.—It is considered good practice to bleed a little—that re-
duces the congestion of the genital organs. If this won't work, then
give gelsemium or bromide potash; if very nervous, give in very small
doses; best to give them together. Give a purgative—nitrate of potash;
give soft feed; keep cool and quiet. Morphine, chloroform, etc. increase
the excitement.

LEUCORRHEA.—Is a catarrhal discharge from the female genitals—

a muco-purulent discharge usually of a whitish or yellowish-white color, sometimes from the vagina, sometimes from the uterus.

Etiology.—Is probably due to injuries inflicted during parturition, especially in cases of difficult labor where force must be used to assist the mother, and more particularly when there is mal presentation; great care should then be taken not to wound the parts with the instruments, also not to poison the parts with dirty hands. Then again there may be a retention of the whole or a portion of the placenta for a time—this will poison the parts.

Semeiology.—The mare is usually unthrifty in any case, also the females of other animals, but is probably more common in the cow. They become thin in flesh, staring coat, the discharge is more or less offensive, continuous, and usually profuse, though at times may be slight.

Treatment.—Wash out the parts with a pump. Allen's is the best, because you can pump in then out again, but an injection or stomach pump will do. After cleaning it out, make a careful examination. Ascertain the cause of the trouble; often it is ulceration of a portion of the mucous membrane—either of the vagina or the uterus; in such a case use prophylactic treatment. Local application—pulv. boracic acid applied directly to the ulcerating surface; give iron, arsenic, vegetable bitters, liberal diet.

BARRENNESS IN FEMALES (STERILITY, FAILURE TO CONCEIVE).—This is quite common in well-bred cows, and is often curable. A local examination may be made, first with instruments, using the dilators. If anything is wrong that cannot be seen when using these, then take the vaginal speculum, and if necessary to examine the uterus, use the uterine speculum, first lubricating the hand; then go in and see if the os uteri is open, using olive oil on the hand; if closed, try to open with one finger, if you can't open it, then use the dilator. If it is yet difficult, then smear the end of the dilator with belladonna or cocaine. If the Leucorrhœa comes from ulceration, the membrane will be darker in the ulcerations than on the normal membrane; in that case use the curette, scrape all the diseased mucous membrane well, and then dust on with a powder blower, some impalpable powder of boracic acid. In case you find a Tumor, catch hold of it with the uterine forceps, and if attached by a pedicle use the scissors instead of the ecraseur. While you are operating catch hold of the os with an instrument for that purpose, and you can draw it back from two to six inches without any danger, as the os is not sensitive. The instruments shown by Dr. Baker were designed by Dr. Knowles, formerly of Terre Haute, Ind., who said the secret of his success in treating for Barrenness was to treat the diseases the animal had in the genitals. This ulceration of the vagina and uterus is the most common one; another trouble is, the placenta often hangs on several days or weeks, and if not removed by artificial means might hang on for several months, and this rotting poisons the parts and causes an ichorous discharge that inflames the vagina and uterus. Leucorrhœa has a tendency to render the secretions of the genitals acid instead of being slightly alkaline or neutral, as they should be. If even feebly acid it will destroy the spermatozoa and prevent fecundation, so you will often find nothing apparently wrong, particularly in the mare. In this case better examine the secretions with litmus paper. Obesity is also a cause of Barrenness.

Reduce animal; give plenty of exercise. Tuberculosis is frequently a cause of this trouble, and is very common; or it may be from Cancers, or any kind of Tumors, or ulcerations in the parts. Sometimes a cause is the firm contraction of the os uteri, and it fails to relax; in that case it often causes a serious disease of the uterus, due to the shutting up of the secretions that are still going on and which should be discharged. In such a case it is best to put the mare under treatment for ten or fifteen days to get the uterus membrane in healthy condition, then wash out with mild antiseptic; boracic acid is the best when you can get it chemically pure, but if not, use alcohol or a weak solution of iodine, which is very good. Sometimes it is necessary to cauterize with iodine, so use the long forceps with the cotton—it won't hurt if you do touch the healthy part; and where you find the whole surface of the os affected and indurated, it is well to use the iodine over the whole surface, in its full strength, first mopping out the parts clean; do this for some days. Sometimes mares are injured during copulation, may be by the male's penis being too long; this is true in heifers—they are often severely injured; not very common in mares. Remember, there is no specific to cure Barrenness.

In case of hyperæsthesia of the genital organs during copulation, the female organs undergo a state of erection as well as in the male, and this often amounts to a disease of the uterus; during copulation the spasm of the uterus is often excessive and lasting afterwards, so that the os and cervix don't relax and the semen can't be introduced. Sometimes the passage to the uterus is plugged with a firm lymph; this plug must be removed; this is what is termed opening a mare; the organs may be in health every other way. You can usually open with the finger, and especially by using belladonna, vaseline, etc.; if not, then use the dilator. In case the secretion of the genital organs is acid, it is a good plan to rinse out with boracic acid, and put on alkaline course of medicine—as bicarbonate soda, lime water, or prepared chalk; this changes the character of the secretions to alkaline. Nowadays they are introducing the spermatozoa into the uterus artificially and with good results, both in the human and lower animals. Let the stallion cover the mare, then when he comes off insert the hand and catch the semen and put into a syringe that is heated blood-heat, then introduce it into the uterus. It may be carried some distance, and it is said it can be shipped and will work if kept at the right temperature.

IMPOTENCE.—This is Barrenness in males, so the fault is not always in the female; this in the male is often due to masturbation, and is a very common practice in the lower animals as well as in the human. It is also spoken of as onanism; some suppose the dog doesn't masturbate, but they are wrong. THEY take different ways to accomplish it; the dog lies down and takes it in his mouth, or by arching the back rubs it against his belly till he goes off. The bull and the stallion also follow this last way. It is common in the stallion, due to high-feeding and idleness. The best thing to do is to give fatiguing labor; it is better than medicine, and avoid over-feeding, unless he is run down by the practice, then feed and give work accordingly, and use a shield. A colt or other young animals will not masturbate without erection, but older animals will, even without the erection, but they will discharge in the sheath. Sometimes it is spontaneous, as in the case of the boy that does so in his

sleep; this is often caused by idleness and high living, also by masturbation; boys are worse between the ages of fifteen and twenty; fathers should warn their boys against it. It shows in young stallions in their speed and flesh; they sweat easily and are unthrifty, and the spermatozoa is often found in the urine. He is often barren. Disease of the testicle is also a cause of Barrenness, also Tuberculosis, and other forms of blood poisoning; sometimes the only trouble is Atrophy of the testicles from a faulty blood supply or mal formation, which may be congenital. Stallions that have done much work are liable to get enlargement of the prostate glands. Some stallions come off the mare proud, had no ejection; then it is recognized by all practitioners that copulation was a failure, but I knew of one case that was not a failure, but the animal got colts—it was a French percheron. It is a case of Satyria. Give rational treatment—as purgatives, light diet, and more exercise; always look to the hygiene in these cases. Keep on tonics three or four months. Last resort, Castration.

NOTES ON OBSTETRICS CONTINUED.

MISCARRIAGE (ABORTION), AND PREMATURE LABOR.—Abortion, when there is expulsion of fecundated ovum or foetus before it can live outside the body of mother. A premature labor is a foetus born ahead of its time, but coming alive and living a greater or less length of time after birth. Abortion implies that the foetus becomes dead or dies as soon as it strikes the air, while premature birth does live. Cows have more tendency to abort than other animals; women are next in frequency.

Etiology.—Causes of Abortion, not counting those produced by operations, are, Accidental, Habitual, and Infectious.

Accidental are caused by violence, falling, kicks from other horses or ill-tempered men; Acute Indigestion in form of Intestinal or Gastric Flatulence, spasmodic Colic (severe), febrile diseases when fever runs high; large draughts of cold water when not severe enough to produce Colic, interfere with foetal circulation, eating of frozen or musty food, powerful drugs in large doses producing shock to system, ergotized grain or grass, drastic purgatives—as aloes, sudden and severe exertion, especially if not accustomed to it, obesity, plethora, poverty and anæmia, nervous diseases, as Neurosis (when severe), Tetanus, diseases of the uterus, Glanders in mare, contagious Pleuro-Pneumonia in cattle, Influenza, Strangles, shocks to nervous system, fear, undue excitement, excessive bleeding, sometimes copulation during pregnancy, operations with or without castings, heavy thunder, especially when it lasts long, sight of blood on other animals, smell of decomposing animal or vegetable matter; dogs worrying sheep, often cause ewes to abort; ecbolics given for any other purpose, or it may be produced intentionally by the use of ergot, rue, and savin; diseases of foetus, feebleness of spermatozoan from over-work in the stud, etc.

Habitual Abortion is apt to occur in those that have aborted once from accidental cause, probably due to weakened condition of uterus.

Infectious Abortions are due to presence of a germ that gets into the vagina and sets up irritation, with the effect apparently of opening the os uteri and extension over wall of uterus of this irritation produced in the vagina. Some claim it is a Micrococcus, but the generally accepted

opinion is, that it is the *Penicillium Glaucum*, or ordinary blue mole, that is supposed to be the most common cause of it. Cows seem to be the only ones suffering from this cause of Abortion. We find that it rages as an Entozootic or Epizootic in the wet season, when moles flourish.

Semeiology of Abortion—Usually occurs without any premonitory symptoms; comes away easily, depending on stage of gestation; generally occurs in from six weeks to three months. Fœtus is usually found on the floor in the morning. When it occurs after four or five months, it has many signs of normal parturition—as dullness, uneasiness, abdomen drops, mammæ become congested, vulva swells, labor pains are those of normal parturition; the membranes may be all expelled with the fœtus, especially if the Abortion occurs in the early stage of gestation. In some cases they become ruptured and fœtus is expelled naked, and the placenta comes along later. Sometimes we find that fœtus, after entering uterus, stays there and decomposes, producing constitutional disturbance—as Septicæmia, Ulceration of womb, Leucorrhœa, occasionally death. Abortion if occurring extensively in dairy, causes great losses in supply of milk. Conception may take place as soon after Abortion as after a normal delivery, but occasionally it is delayed for weeks and even months, according to the amount of disturbance the Abortion produces. Any uneasiness of a pregnant female should be considered suspicious of possible occurring Abortion, and she should be watched with a view of differentiating between Colic and Abortion. Where the premonitory symptoms are recognized early enough, Abortion may be prevented.

Treatment.—Prevention is the main thing; do this by removing cause if possible. Case should receive very careful examination. For Habitual Abortion we recommend hemp seed; give one half pint once a day to those that are not over-fed. Habitual Abortion occurs about the fifth month. Begin feeding hemp seed three or four months up to within a few weeks of parturition. Fl. ext. *viburnum prunifolium* is looked upon as the best remedy; give rather freely. To human female, 1 dram of the fl. ext. can be given once a day as a preventive. Give every hour or two if there are any premonitory symptoms. In cases of accidental injury, Abortion can be averted by giving this and other remedies—such as chloroform, opium, camphor, asafetida, chloral, etc. Chloroform, two to three dram doses every hour until danger is passed; Camphor 20 to 30 grs.; opium, 1 dram night and morning until danger is passed. If female is in anæmic condition, iron and other tonics are indicated. If rupture of water-bag takes place, Abortion is inevitable, but rupture can be averted. In case of such rupture fœtus perishes and becomes a foreign body; fatty degeneration of placenta takes place, and Abortion is the result. Occasionally in late stage of gestation, delivery is hard and help is needed. When from ergot, stimulants and tonics are indicated; when due to infection, remove aborting cow as soon as discovered and remove everything connected with abortion—placenta, fœtus, and juices, and burn them. In case Abortion is repeated without any apparent cause, always suspect infection; clean out stable, wash out manger, clean out cobwebs, sprinkle floors with disinfectant—such as crude carbolic acid or emulsion of kerosene (eight per cent) and water, with enough carbonate of lime to make emulsion, and shoot in the cracks with force pump. When this is done, whitewash the cow that has aborted. If it is due to

infection, she will carry seed of this germ for a long time. Remove her as soon as discovered, and don't put her back for at least five weeks.

RUPTURE OF UTERUS.—May occur before or after parturition, as a result of external violence.

Treatment.—Is useless; destroy the animal.

RUPTURE OF VAGINA.—In mare is fatal; in cow it can be sewed up, or if there was not too much laceration, will heal itself.

RUPTURE OF PERINEUM.—Is liable to occur in any animal, called Jill Flirts by horsemen. May be partial or complete, may be lacerated, making continuous opening between anus and vulva, and faecal matter passes down into the vulva before it passes out, and gas does not escape. Whenever this occurs it should be attended to at once, in case it occurs when you are present. It may occur on account of overstretching of parts. As soon as delivery is effected, sterilize wound with antiseptic and sew it up. May rupture from without inwards, and in sewing up begin on inside letting the knots come in vagina and work down. If rupture has extended into the rectum, stitch this first, then the vagina; use fine silk and needle, and put stitches close together; then hold part in place and put in the vagina a lump of oakum or cotton; dress two or three times a day. For internal dressing in rectum, sulphur ointment is very good; blow on iodoform, starch, and boracic acid; before powder is applied the wound should be dried thoroughly. In case the stitches rupture, scarify wound afresh and sew up again. Give soft feed.

METRITIS METROPERITONITIS AND PARTURIENT FEVER.—Almost invariably septic, might be Traumatic, and is usually fatal, especially in mares and women; cows are not so susceptible to it. Sepsis may occur through several channels—first, acute infection, infect themselves from germs and filth in their own tail, so that a case of this kind may develop after you have assisted in delivery. Organ becomes swollen is of reddish color, is always infectious, and almost invariably fatal. Tail of mare should be washed out after parturition, and put the animal in a clean stall with plenty of bedding. May come from dirty ropes and instruments. Cotton ropes are the best. Second specific method of infection by practitioner going to a case of parturition from a case of Erysipelas or Strangles.

Treatment.—As soon as we are convinced that she is suffering from sepsis, sterilize all the genital organs with antiseptic. The best is a two or three per cent solution of boracic acid at a temperature of 110° Fahrenheit, used in large quantity, leaving it in at least five minutes. Give quinine and alcoholic stimulants internally, also hyposulphite of soda and mild laxatives.

PARTURIENT ECLAMPSIA.—Is convulsion of body due to nervous results following parturition, and may result in slight or complete convulsions; not common in lower animals.

Etiology.—Rather obscure. When due to an hysterical condition, simple hyperæsthesia is a cause, is closely allied to hysteria. May be seen in mares, cows, and bitches. Mares show it more often the first three or four days, cows not so susceptible to it; bitches usually show it during second and sometimes third week, when nursing puppy after parturition. They are panting very hard, and are in great distress. It very much resembles strychnine poisoning, and is frequently mistaken for it.

Treatment.—For bitches give chloral hydrate; take puppies off for twenty-four hours; give gelsemium and bromide of potash, or fl. ext. cannabis indica and hyoscyamus in a mixture. As soon as cramps are relieved repeat the doses until you get relaxation; give a dose of oil as soon as cramps are over, and feed liberally after recovery. In mares give same medicines in larger doses; if not sufficient, give chloral hydrate in addition, and give laxatives as soon as cramps are subdued.

PARTURIENT LAMINITIS.—In mares it is common, due to sympathetic condition existing between genital organs and teeth.

Treatment.—Liberal doses of nitrate of potash internally. Local treatment, same as ordinary Laminitis.

NOTES ON THEORY AND PRACTICE CONTINUED.

URTICARIA, SURFEIT (IN HUMAN, NETTLERASH).—Is prickly heat. Skin diseases in the lower animals are rare as compared to the human, nor are they so complicated or severe. There are a great many varieties in the human due to inherited taints; that is in the blood. The lower animals are liable to nearly all the acute forms. Many of the diseases of the skin are sympathetic, that is with other organs of the body, and do not arise as a primary but as a secondary affection. This exists in two forms in the horse—Acute and Chronic. It is an eruptive disease; in the acute form it comes up suddenly in blotches, varying from the size of a little finger nail to the size of a hand, and they are sharply circumscribed; they are irregular in form—some are round, others oval, others irregularly round; usually raise up about one eighth to one fourth of an inch in thickness, sometimes more than that; sometimes they go away as quickly as they come; other times they remain for hours, days, months, or may become chronic and remain for years.

Etiology.—Predisposing cause is over-feeding and idleness; horses fed on corn are more liable than those fed on oats; there are more heat and starch in the corn, and it makes more adipose tissue. But it may occur with any kind of strong feeding, particularly if kept up, and more especially if one kind of food is kept up, without change of the kind. It is mostly due to the stomach by Indigestion, so that the horse is plethoric in every case, though he may look thin in flesh. The exciting cause is the sudden heating up; it usually develops in warm weather, especially after a little exercise. Giving little or much grass may produce it, especially if having been fed on grain; runners are more liable in this respect than thoroughbreds. Sometimes this disease covers every part of the body, other times is confined to the neck and shoulders. This eruption itches furiously, other times not at all; sometimes they are mad with the itching. The blotches are not sore in the acute stage, and there is no discharge.

Treatment.—Depletion is indicated, so give purgatives—either aloes or salines, then fast except to give bran (bran slop) for twenty-four hours, then following the purgative action purify the blood, deplete, and give diuretics for three or four days after. When it comes on from eating grass, as in the case of the runners, it often does so spontaneously and is always in the acute form. In such a case don't deplete, don't give purgatives, don't need anything; will get well himself, but you must make some show before the owner, so give mild diuretics, as $\frac{1}{2}$ oz. nitrate

potash, either in the drinking water or in bolus, and give a little bitter tonic—*nux vomica* or *gentian*. When the itching is severe, a local anodyne wash may be used—as dilute acetic acid; sponge all over with warm water with a little common salt in it; add a little hydrocyanic acid to the wash, or sulphuric acid 1 dr. to quart of water, is found good; he will steam from this, and then cool off. If that doesn't do, then try lotion of bicarbonate soda; remember the skin is sensitive and will absorb readily any strong lotion, therefore you can't use sugar of lead.

Chronic Form.—In this the blotches remain permanently; it is very difficult to cure as these blotches are often very sore, and with a little fever in them; the hair occasionally drops off. These patches are apt to spread slowly, and don't usually occur close together, compared to the acute; but in portions of the body—as hip, shoulders, etc., they are inclined to spread. Give alterative tonics—arsenic, sulphur, iodide potash are indicated; keep the bowels loose; give grass diet if possible; sulphate soda occasionally, and keep on with the iodide potash and arsenic for several weeks, or longer if necessary. Give charcoal, *gentian*, or *nux vomica*, or *ginger*. Let up on the soda for a week, then go on again; in this way you treat the digestive organs as well as the blood, for the blood has become poisoned. Acute cases may run into the chronic and require long treatment; may take a year or two to cure. In many cases can be cured in from five to six months. The first three or four weeks after beginning treatment may make it worse, but the blotches will gradually disappear. Frequent bathing in cold water is good, just cold enough to get cooled off, and make it a little alkaline with bicarbonate soda.

PSORIASIS (MALANDERS AND SALLENDERS).—Malanders may occur back of the knees, and Sallenders in front of the hocks. It comes in flexors of joints, described as squamous skin disease. It is subacute and runs into chronic inflammation of the derma; as a result of this the skin becomes thickened, dry, and cracks transversally, sometimes from one half to three fourths of an inch deep, and they discharge a bloody serum, and unless treated in the early stages are very hard to cure. The first thing noticed is a sweaty discharge, probably from the same cause as Grease Heel. If it is vigorously treated in the early stage it will yield to treatment, but in the chronic the treatment must be almost continuous. Generally seen in plethoric draft horses, seldom seen in the runners. The large surface sores that develop on the body of the draft stallion are about the same as those of *Urticaria*, but deeper-seated, and have not the abrupt edge; often come up as large as two hands, the skin gets thick and cracks, the discharge is purulent, and part often sloughs off. The part itches intensely, the horse will bite and rub it, and that causes more itching. It is very difficult to cure, especially when on the limbs, but they occur more often around the trunk, though may at any place.

Treatment.—For all these diseases treat about the same; deplete, but give moderate doses of purgative and repeat; too large are liable to produce superpurgation. To draft stallions of 1,800 lbs. give 1 oz. aloes or 1 lb. sulphate of soda; you can't cure without depleting. Give alteratives, then diuretics,—arsenic, sulphur, green corn (stalk and all), but little oats or corn.

Local Treatment.—Anodyne washes—some mild form of mercury, use it as an antiseptic. Mix a little blue ointment, or wash with alkaline

wash—bicarbonate of soda or potash. Sulphur and lard are good, one to three parts; add a few drops of carbolic acid to allay the itching. If they granulate too much under this treatment, Tumors may form. Try to reduce with ointment of iodide potash and lard, one to eight parts, and give iodide potash internally, then change occasionally to white lotion; some use sulph. copper in lard, one to eight, or acetate copper in lard, one to eight. For the cracks in the joints use castile soap and water; keep animal quiet. If they are inclined to granulate too much, touch with lunar caustic, and dry up with white lotion. A wet pack for a few days is good, a two per cent solution of carbolic acid, then follow with bicarbonate potash or soda.

PITYRIASIS.—Is a more or less chronic skin disease, with a general thickening of it; is associated with poverty every time; whether it is the lice that cause it, or it causes the lice, is not known.

Symptoms.—The skin is thickened and scaly, may be one eighth to three quarters of an inch large, under these scales the lice burrow and reproduce.

Treatment.—Bathe with soap and water, soften the scales, destroy the lice, and remove the cause. Feed them better; kill the lice with kerosene used in two ways—an ointment of one part kerosene to three of lard, or an emulsion of eight per cent kerosene and water; add a little carbonate potash so that the oil will mix. This should be also used with a force pump and shot into all the cracks and every place where the lice could be. This disease more often exists in cattle. This emulsion is also used to sponge over the cattle, but never apply kerosene clear. This is a good remedy if the horse is affected with any kind of lice; where the coat is heavy, best to clip off if surroundings will permit. Tobacco juice is also good; make an effusion of 1 lb. tobacco to 3 gals. of water and only apply to about one third of the body at a time, as animals are easily made sick if applied all over; repeat the wash. In cattle you may sponge them all over with it freely, and repeat in a week or ten days, as nits will hatch.

ACNE.—Little isolated eruptions—pustules. In cattle there may be grubs; there are none in the horse. These pustules itch very much, and usually occur on the neck and shoulders, or under the saddle. They often become chronic and must be cut out, but in the acute stage may be cured. Give alteratives and wash with soap and water and common salt; arsenic and sulphur internally are good. If under the saddle, use white lotion.

PRURIGO.—An intensely itching disease of the skin, due to a disordered or deranged peripheral sensibility; the cause usually is Indigestion, most likely from over-feeding. There is no morbid anatomy, no eruptions, no thickening of the skin, no inflammation—simply itching.

Treatment.—It invariably occurs with plethora; give purgative, follow with diuretics; bathe with alkaline wash or common salt. One form of this is an itching around the hock; sometimes the attack comes on suddenly and the animal rubs off the hair and the flesh in his suffering, but it only aggravates the trouble.

Special Treatment.—In addition to alteratives use sugar of lead. It may be due sometimes to Ascarides in the rectum. If you think so, give injection of turpentine 1 oz. to $\frac{1}{2}$ pint oil, or salt and water. A solution of acetate of lead $\frac{1}{2}$ to 1 oz. to pint of water is best, and sulphur intern-

ally rather freely. If that doesn't cure, then put on arsenic treatment. Arsenic is the best skin remedy, sulphur next, and iodide potash next.

ERYTHEMA.—Simple inflammation of the skin, superficial, not deep-seated; there is a redness, and it often goes on to desquamation, leaving a raw surface. This covers the most ground of all skin diseases, as it includes stings or bites of insects, frost bites, chilblains, scalding by fire or water, chafe from harness, scalding of the skin by urine, or ichorous pus; sore teats in the cows, ewes, bitches; Scratches, Cracked Heels, Mud Fever in horses and cattle.

Etiology.—Anything that produces simple superficial and local inflammation would be sufficient to cause this trouble; **SCRATCHES** and **MUD FEVER** in the horse especially, are due to exposure to mud and slush, and improper care of the legs, too much washing or hand rubbing or soaking. Using the hose to wash off mud; white legs that are often washed are very susceptible to it. In trotters the cause is generally too much soaking or tubbing; this causes too much softening of the skin, then when taken out of the water it dries, and fever takes place from the drying, this causes inflammation of the parts, the function of the sebaceous glands is arrested, and the sebum is not present to protect from maceration the skin of the legs.

Semeiology.—**MUD FEVER**, swelling of the legs; in severe acute case legs get hot, the whole animal is more or less feverish, legs from knees and hocks down are sore to touch; they are stiff and lame. In a few days the skin gets scabby, feels as if it had been blistered, these scabs become exfoliated, and often the hair comes off with them and legs may be bare up to the knees; if it is a white skin it will become purplish red. If neglected and not treated it may run on to chronic Big Leg, or to continual stocking of the legs if left standing long. In milder cases it simply breaks out in the hollow of the pastern and is then called Scratches. Sometimes this is very sore, with considerable swelling of the skin and transverse cracks at the flexor of the joint, sometimes quite deep. In chronic cases, as seen in trotters and typical forms, there is a gradual destruction of the normal skin, considerable granulation and raw surface; and when this heals after long treatment it leaves a cicatricial skin, and thickened. In cows, ewes, and bitches the teats get sore and chafed from being wet too much; in cows from a habit some have of wetting the teat with the milk when milking; the proper way is to squeeze the teat; or the offspring sucking so much may be a cause; scalding by the urine is a frequent cause. In males it may be ejaculating the urine forcibly so as to spray the fore feet or legs; this is often recognized by passing your hand over them, then smelling your hand; or from urinating on bare floor it splashes on them; another form is urinating in the sheath, may cause the sheath to become raw and swollen, and a milky discharge to flow from it; another form is where they throw the urine up against the belly.

Treatment.—In Mud Fever you have constitutional disturbances with local inflammation, so treat both; give laxatives—aloes, and potash; put on soft diet, don't let go out in the mud. Remove the cause the first thing, if showering, washing, or tubbing. For local treatment, the best way to reduce the inflammation is to use hot linseed poultice with a little carbolic acid added; it acts as an antiphlogistic; use about three per cent solution; change the poultice twice a day. Give diuretics with the laxa-

tives. After four or five days stop poulticing; then the fever is reduced, the inflammation gone, soreness gone, still the swelling remains; wash the leg clean, then dry, then apply sugar of lead lotion $\frac{1}{2}$ oz. to pint of water, or powdered borax 1 oz. to pint, or boracic acid; the lead is the best of all. Sometimes the fever returns after about twenty-four hours; then repeat the poultices, alternate with the lead lotion, say for a week. Glycerine, and a little carbolic acid in water is good to apply—one third glycerine two thirds water; or any anodyne or astringent after the inflammation is reduced, is indicated. Maintain the diuretics for ten or fifteen days; usually they require a tonic—give gentian, iron, quinine or arsenic, together or alone; iron is indispensable. In bad case give arsenic, nux, and gentian. Give quinine in tonic doses—10 to 20 grs. three times a day. If thin give a little iron. In chronic case use fly blister.

SCRATCHES.—The same treatment; usually don't need the constitutional, still will do no harm; give purgative and soft feed. After poulticing three or four days, and after the inflammation is reduced, oxide of zinc and lard, one to eight, or better—sulphur and lard one to two, or a good plan is to change them. White lotion is very good. We prescribe sugar of lead, one part petrolatum, eight parts. In the chronic form, as seen in trotters, the first thing to do is to remove the cause. If the feet are sore and must have tubbing or soaking, let him stand in an inch of water instead or more than that. You must not be too wise with trotting horse owners, but handle them with soft gloves—they think they know all about a horse. If the horse is to race next day, poultice all night, and in the morning wipe off nice and clean and put on petroleum and sugar of lead, then go out. Stallions often get this way tied up in stall; idleness and high living, and other causes, and taken out a little; exercise causes transverse cracks. Give purgative and diuretics, and change the food; put on the poultice with carbolic acid. In case you find a thickening that won't yield to this treatment, use a cantharides blister—that will stimulate the absorbents and circulation, then return to former treatment.

FROST BITES.—Cold applications are the best, gradually applied. In very bad case treat on general principles; reduce the inflammation, give laxative and diuretics.

BURNS.—Use some oily substance to keep out the air—oil, rendered alkaline by adding lime water, is the best; oil one part, water four parts; apply to the part and cover with absorbent cotton. If the pain is great, give hypodermic injection of morphine; dress the burn twice a day. After the inflammation is reduced and the skin destroyed, the white lotion is good, or oxide zinc and lard.

SORE TEATS AND SCALDS FROM THE URINE.—If the horse urinates in the sheath, teach him to extend it. If the sheath is inflamed use acetate lead and carbolized oil on his yard. If he urinates on the belly, tie shield or leather apron in front of the sheath. In bad cases it is often necessary to clip the hair, but unless absolutely necessary would not do it.

Preventative Treatment.—The less the legs are washed the better. If he comes in with dirty legs in Fall, Winter, or Spring, let him dry, or rub off gently with wisp of straw, in the direction of the hair, never against it. Then dry, and brush off. If the barn is cold wrap a light fold of flannel around till the leg dries. I never allow washing from the

first of Nov. to May in any stable where I treat, and never have any of these cases.

ECZEMA, (or I boil out, I effervesce) **HERPES**, and **IMPETIGO**.—This includes all the skin diseases that are accompanied with eruption, with pimples filled with water, pus or other contents. The different kinds under this head are Simple, Papulæ, Pustular, and Rubrin. This is the most common skin disease in any animal; best characterized by the eruption with a discharge, or else it is not Eczema. This discharge may vary in quality, quantity, etc., in the different stages of the diseases, but it is always present.

SIMPLE.—This comes on suddenly and is usually confined in the horse to the neck and shoulders; sometimes where the skin is thin inside the thigh. There is intense itching, and the horse will sometimes rub the skin off; little pimples and vesicles will be found there, crop after crop will come up, discharge a thin watery fluid, then dry up and be followed by a new crop. There is not a bit of contagion connected with it. The cause is usually a deranged condition of digestion, usually due to over-feeding, very heating food, highly nitrogenous, or on one kind of food long continued.

PAPULÆ.—This is characterized by little elevations on the skin, resembling the papules or teats, and with more or less fever around the basis of the papules; sometimes there is a pimple in the center, but not always. As a result of the fever at the basis of these, the hair falls out and usually remains hanging to the end of the papules, making it look like a rat-tail, as it is sometimes called. This form is inclined to become chronic and remain with the animal. It is seen more often on the legs of heavy draft horses and oxen, especially when working in the mud. This form is usually confined to the legs, and is probably due to the cold mud and water, or on account of some caustic in the mud, as we see in limestone roads; the lime becomes slacked and that scalds the legs of the animals.

PUSTULAR.—Is somewhat similar to the Papulæ form, but differs in the discharge—it is continuous and profuse, and the contents of the pimple is purulent. It is watery at first, but after twenty-four to thirty-six hours becomes pus. The most common manifestation of this in the horse is **GREASE HEEL**; occasionally in the discharge you will find parasites, according to Prof. Herring, *Sarcoptes Hippodusi*, but it has been proven that their presence is simply accidental. In Grease Heel it is seen on the back of the leg. In addition to the Pustular, we find there is a suppurative inflammation of the sebaceous follicles.

Etiology.—It is a constitutional disease in most cases, almost invariably due to some humor in the blood, probably due to faulty excretion of the effete matter; this acts at least as a predisposing cause, and the exciting cause is usually exposure to mud, slush, and cold water, but not always. Sometimes occurs in warm dry weather, but the rule is in Fall, Winter, and Spring, oftenest in Spring because the blood then is thicker, and there is an accumulation of effete material in it; then cold water, as from snows, sets up a mild inflammation and causes the disease. It is usually associated with plethora, though sometimes we see it in thin animals.

Semeiology.—There is acute inflammation with swelling of the back

of the legs, usually of the fetlock, or extending down to the heel, and may be up half way to the hocks; there is great soreness on pressure, and itching; may stand on one foot and scratch the place with the other. In course of from twenty-four to thirty-six hours a discharge develops, so that the leg usually looks wet, feels greasy, and smells horridly fetid; this odor is characteristic to Grease Heel. The discharge is colorless or slightly amber-colored; sometimes it is so profuse as to run down the legs and drip off. If two legs are affected at one time then he is a cripple. On account of the drying up of the sebum, in a short time the leg will begin to crack, usually in the back of the fetlock, may be in two, three or four places. In some cases the pustules run together, becoming confluent, and on account of the continued inflammation, is probably due to the animal parasite. The vesicles often crop up like grapes, and are called GRAPES among horsemen; they are nothing more or less than fungus growth, and being so they come up quickly and are of a purplish red color; they bleed easily and discharge pus continually, and the leg during this time swells to four or five times its normal size, and is inclined to remain so; being chronic then, is usually called BIG LEG, known technically as ELEPHANTIASIS. Sometimes the grapes on Big Legs are so large, sensitive and vascular that they bleed on the least friction; are sore and make the horse lame, and finally become a chronic condition. The transverse fissures on the back of the leg become deeper, there are more of them, and they of themselves set up inflammation and more enlargement. These great Big Legs are often due to Lymphangitis. One attack of Grease Heel leaves the animal predisposed to recurrence on slight cause, and each time leaves it larger than before.

IMPETIGO LABIALIS OR CRUSTA LABIALIS.—Is another form occurring on the face and around the mouth; this is in little animals, frequently seen in little babies; of the lower animals, perhaps the pig is most liable to it; it is probably due to the wetting of the mouth in sucking, and saliva. There is a similar form in the adult, due to grazing when the dew is heavy on the grass on a cold morning after a frosty night—especially the horse; the mouth, lips and side of the face get very sore; often they must be taken up, they get so bad. The form existing in pigs is almost malignant; it starts at the mouth, and spreads sometimes over the whole body, and produces so much wasting as to cause death, the body being a mass of sores; is usually associated also with high feeding on corn.

Treatment (In general, particularly as it relates to the horse).—It arises from causes within the body, usually something connected with digestion; as a rule there is torpidity of the liver, so first remove the cause, clean out the sewers of the body, clean out the debris through the natural channels, not through the skin. Give purgatives that pass through the blood before acting on the bowels—aloes and salines are indicated; follow with alteratives and diuretics, iodide potash, or sulphate soda. For local treatment, in the acute stage clip off the hair and poultice; add a little carbolic acid; charcoal is good; change the poultice twice a day and use soap and water freely. In bad cases change three times a day, and keep up until the discharge is stopped and inflammation subsides—that will be about four to ten days. Then give tonics internally—as arsenic in tonic doses; alternate with sulphur, give sulph. soda occa-

sionally, afterwards treat the heel as a simple inflammation, with lead or solution of bicarbonate soda or borax. If the fever returns repeat the poulticing and other treatment; as the swelling leaves give little exercise, but if it hurts, stop it. If the grapes crop up, clip them off with scissors close to the skin, and burn with sulphate copper, Prof. Williams' recipe:

R	Sulphur	8 ozs.
	Acid carbolic	1 oz.
	Potass. carb.	4 ozs.
	Adeps	32 ozs.
	Oil oliveæ	32 ozs.

Mix and plaster on two or three days, then wash off. For simple case muriate ammonia 1 oz. to pint of water, and acetate of lead where there is not too much eruption. For bad cases, sour solution of arsenic, as the potash in that is valuable, from $\frac{1}{2}$ to 1 oz. two or three times a day. Powdered arsenious acid 2 to 5 grs., two or three times a day is good. For the pig, wash off scabs with soap and water and apply saturated solution of borax, or boracic acid dry.

Treatment for BIG LEG from Grease Heel.—Get the condition in good shape; give mild purgative, follow with diuretics—iodide or acetate potash; then give arsenic, iron, and little nux vomica. Give horse regular exercise; if a valuable horse, morning and night, and from four to eight miles at a time, but slow and gentle. When he comes in, shower the leg with cold water (if in hot weather) below the hock, then do up with dry derby bandage over the wet skin and hair, leave on several hours, then rub generously with the hand. In cold weather put on the bandage without showering; change the food—keep the stomach in good condition.

In the dog there are two forms of Eczema; Rubrum only in the dog and human; then a pustular form which is a form of *Canker in the ears* of dogs; it breaks out as a result of surfeit—humor in the blood. The etiology is precisely the same as in Grease Heel, but confines itself to the external auditory canal. There is swelling and eruption of pimples, and a discharge of black gummy foetid pus, followed by granulation of the pustules, and in bad cases the complete filling up of the canal; complete deafness follows; sometimes the granulations heal, filling the canal solid, and remain so ever after. One early and continuous symptom is the soreness of the ear.

Treatment.—Much the same as in Grease Heel; epsom salts or magnesia; follow with iodide potash and arsenic.

Local Treatment.—Wash out the ear with soap and water, use a syringe; tap the cyst, rinse out with saturated solution of bicarbonate soda, then pour in caustic solution lunar caustic (nitrate silver), strength 40 grs. to oz. water; cauterize with this once every two days, for about three or four times, that is for an old case; wash once or twice a day, then reduce the strength of the silver to 10 grs., apply once a day for three days, then change to white lotion. But for dog's ears, usually make it $\frac{1}{2}$ strength; use this for from four to six days two or three times a day, and wash out once a day with soap and water; then after using this lotion for about six days, change to saturated solution of borax and keep up till well. Regulate the diet. In a very mild case wash out with soap and water and use white lotion and solution of borax. Rubrum usually occurs on the

belly and down the sides, and the hair gets rusty. It is a constitutional disease—used to be called **RED MANGE**. Treat with purgative and follow up with tonics—especially arsenic. This is not contagious.

ERYSIPELAS.—Is a very peculiar kind of inflammation of the skin, and is recognized by all as being contagious or infectious at times, but not always. It is recognized as being malignant, that is it is inclined to spread, and through any kind of tissue. It can be carried from one to the other by actual contact, and pregnant females will abort if exposed to the poison of Erysipelas; and following parturition, fatal Metritis may be taken by any female by coming in contact with the poison; this is particularly so in women, also in dogs. This seems to be due to a peculiar condition of the blood primarily, that is in the animal in which the disease starts—an unhealthy condition. It usually attacks animals either very thin or very fat, but more so in the lean; probably that is from debility; it is also more prevalent in some seasons than in others, especially when the air is filled with electricity. It starts often in wounds under causes which don't seem to be understood, but is probably due to the unhealthy condition of the blood, and with that an atonic condition of the nervous system. The wound prior to Erysipelas setting in is sluggish, showing a tendency to ulcerate and be unhealthy; doesn't heal benignly.

Semeiology.—It is characterized by a peculiar glistening of the swelling; it is an indurated and tense condition, doesn't pit on pressure, not oedematous. If it occurs with a wound it is generally on the outside; the granulation becomes a purplish red fungus and bleeds easily; is comparatively insensible, and is called **PROUD FLESH**. On the outer part of the wound the inflammation in the surrounding tissue is dense, glistening with swelling, but it doesn't always occur with a wound; it may show no place on the body. In the human it is generally in the head and face, but may be in any part of the body. Horses are most often affected in the legs; the swelling usually has an abrupt line of demarkation; that is well marked also in the human, and the whole case has a peculiar smell—it resembles the smell of mice, or some say of burnt hair or of Small Pox. It has a tendency to spread, and often quite rapidly; it may be two inches one day, the next, four inches in diameter, but it usually increases from about one half to three fourths of an inch in twenty-four hours. The hard tense glistening condition is probably due to the infiltration of exudate into the surrounding tissues.

Treatment.—Apply hot fomentations diligently, and between times apply sugar of lead lotion, freely and strong, three times a day; the saturated solution is the best; in most cases this will control it. In all mild cases this is the usual treatment; in the human, especially where the skin is not broken, but if malignant, or if with a wound, or malignant where the skin is not broken, the best treatment is tinct. iron full strength, six, eight, or ten times a day. In the human it is a very dangerous disease, often where it starts about the nose and involves the whole head and often causes death. In such case shave the head and paint with tinct. iron or tinct. iodine full strength. It is good practice to cauterize the healthy skin just outside the inflammation, usually with tinct. iodine full strength or nitrate silver. Animals usually require constitutional treatment as well. Iron internally is invariably indicated, even if the animal is fat, the blood

may be in an impoverished condition. In fat animals a laxative is indicated on general principles. After recovery is advanced, give iodide potash in small doses to purify the blood; give this in connection with the iron. Isolate the animal and use separate stable implements around him; be careful not to carry it on your hands or person to other animals, especially if going to treat a wound. In the Spring of '75, Dr. Howard in Montreal in the course of two months caused the death of twenty-five women in childbirth from Puerperal Metritis, by carrying the disease to them. If you go to a case, then fumigate yourself after. It is not looked upon as dangerous unless it attacks the head, then it may attack the brain; in old people it is looked upon as dangerous in any part of the body, because it is an indication of waning vitality, especially if in connection with some previous disease. In old persons, as in the case of an ulceration, Erysipelas starts in and finally terminates in death from gangrene.

CELLULITIS.—Is where the inflammation extends to the cellular tissue underneath the skin, so severe as to interfere with the circulation, and forms an Abscess; this occurring in such a way is called

PHLEGMON.—That is, a suppuration of acute Cellulitis, usually the result of some blood poisoning. It often succeeds or is the result of Erysipelas. The skin over the Abscess in this Cellulitis, from the circulation being shut off, often sloughs off, that is the skin over the Phlegmon. The most common illustration of this is in the last stage of canine Distemper. It usually occurs around the animal's neck, breast and throat; it comes up with a tense, hard swelling, is painful, suppurates, and forms Abscess in the cellular tissue underneath the skin. It contains a black offensive pus. In Influenza in horses, known as PINK EYE, the eye closes up by inflammation around the lid; it is acute Cellulitis, but doesn't suppurate.

Treatment.—Iron, quinine and Fowler's solution of arsenic internally. Open the Abscess as early as you can locate it; use an antiseptic strong enough at first to cauterize, then antiseptic after. Poultices are good after opening the Abscess; sterilize them, or use hot fomentations.

FERUNCULUS (Feruncle).—Disease around the feet of horses; it is practically what might be called a boil, due to an acute localized inflammation in the skin and cellular tissue underneath, involving of course the sebaceous glands. It usually occurs around the pastern of the horse, either before or behind, and any place on the fetlock, even above the fetlock, and sometimes it spreads two thirds around the part, or may be confined to a single spot, from the size of the thumb-nail to the size of the hand. It is inclined usually to run a benign course and terminate favorably, but other times it is malignant and is inclined to extend deeply, and in the course of the sloughing expose ligaments and tendons, often below the ligament, as the capsular, causing Open Joint and death from irritative fever when it extends under the corona and affects so many blood vessels, the blood becoming poisoned. A characteristic of this Feruncle is a central core—this is invariable, probably a part of necrosed tissue that has separated from the living tissue, thus forming the core. In the human it is the Boil. It is different from the Abscess, in that the Abscess never has a core; the same distinguishes it from the Carbuncle—the Carbuncle also is anthracoid.

Etiology.—It depends upon the impoverished condition of the blood. We fancy the cause is a bruise of some sort, or frost bite, etc., as the exciting cause. In the Spring of '81 or '82, there was an epidemic of this in Chicago; it was thought by some to be due to the salt thrown on the street car tracks to melt the snow, but Dr. Baker did not think so, as the street car horses were not affected, but that it was due rather to standing in the cold mud and slash. Sometimes it affects one leg or may affect all; it is also predisposed by the torpidity of the liver. It sometimes occurs in dry hot weather.

Semeiology.—In the first stage there is acute swelling of the leg, intense pain, lameness, heat and soreness; that is where there is swelling; often the swelling is so even it is hard to locate the spot where it is going to break. There is always severe constitutional disturbance, elevation of the pulse, pulse increased in frequency and diminished in size, hard and small; the breathing is accelerated, often double; complete loss of appetite, Constipation, and high colored urine; hangs the head and droops the ears. In the second stage, little places of the skin will become rough and corrugated, about the size of a twenty-five cent piece, and after a day or two break in the center and a little hole is left, which discharges pus; in a few hours more the roughened skin breaks and will slough off; this occurs in from six to twenty-four hours after the rupture, though it may hold on for forty-eight hours. When this skin sloughs off the core usually comes with it; this leaves a circumscribed hole; the fever subsides, pain ceases, appetite and other normal functions return, and makes a rapid recovery. The wound begins to granulate, that is the third stage; this occurs quite rapidly, and not only fills up the cavity, but may form a large Tumor above by self-proliferation; the Tumor is covered by a thick cicatricial horny skin.

Treatment.—We are usually called in the first stage, because the horse is then very sick; a purgative is indicated, full dose, say of aloes, then give diuretic and while that is working give fever mixture—aconite, belladonna, spts. nit. ether, nitrate potash and muriate ammonia, in liberal doses and repeat every hour for about ten hours.

Local Treatment.—Hot linseed poultices; soon as you can locate the Abscess open it; McEchran used to open them with a hot iron in the second stage, quite deep; but the knife is just as good, except that it limits the amount of sloughing; then use antiseptic; change poultices night and morning. When the cavity is about three quarters filled, discontinue the poultice and use white lotion; this hardens the cells and it fills over about level with the skin and prevents Abscesses.

MANGE.—Scabies in the lower animals, also called Scab in the human, sometimes the Itch. This disease while strictly a skin disease is entirely due to the PARASITIC DERMATIZOA, spoken of as Entozoa and Ectozoa; the Ectozoa being on the outside of the skin. A parasite is a living thing that lives off other animals, and nearly all are animals, though there are few vegetable parasites, of which the mistletoe is the most noted. It is a notorious fact that no animal is free from parasites, no matter how large or small. The Dermatizoa thus living on or under the skin, produce skin diseases; and every genus has its own parasites—horses, dogs, cattle, etc., that is they won't thrive off one specie, when put on a different specie. It is very contagious from one animal to another of the same

specie—the only exception is the Mange of cats and rats; they will run over a cat and kill in a comparatively short time. The chief feature of this Mange is the intense itching that the ravages of the parasite produce. Wedel discovered the Ascar of the cat in 1672, Kenting those of the horse in 1789, Walz those of the sheep in 1809, Gohier of the ox and dog in 1812, Spinola those of the hog in 1846. These Dermatozoa also are called Ascarus or (plural) Ascari. There are three principal classes of Dermatozoa or Mange as follows:

SARCOPTES.—Most important, those that burrow under the skin or epidermis.

PSOROPTES.—Those that are on the surface.

SYMBIOTES EQUI.—Those on the limbs and in the horses' tails.

There are many sub classes to these. The Symbiotes often cause the horse to lose his tail, making him rat tailed. These parasites usually go in groups or colonies; they sometimes exist on the legs, and there cause the hair to fall off also, and cause considerable swelling; they are not common in this country, but are most common in Europe. Sarcopes are the worst, as they work under the skin, or in the body of the true skin; they also get into the roots of the hair. They produce a swelling of the skin; they are seldom seen in horses, but are common in the dog. Psoroptes are comparatively harmless, except that they cause loss of hair, and cause great distress, but to offset this they work much faster than the Sarcopes, and probably kill faster. The varieties of Mange are as follows:

Horse.—Sarcopes. —Sarcopes Scabiei. Psoroptes.—Com. Symbiotes.—Equi. Of these the Sarcopic Mange is the worst.

Ox.—Psoroptes Communis.

Symbiotes Bovis.—The Psoroptes Com. is the worst.

Sheep.—Sarcopes Squamiferous, that raise the skin up in the scales. Psoroptes Com., known among sheepmen as Scabies Symbiotes Ovis.

Dog.—Sarcopes Squamiferous is the principal Mange of the dog. Symbiotes Canis.

Cat.—Sarcopes Minor, because they are so small they require a magnifying glass to see them—must be a strong glass. It is the principal Mange. Symbiotes Felis.

Hog.—Sarcopes Squamiferous, only one.

Man.—Sarcopes Scabiei or Itch.

The Scab in sheep produces dropping off of the wool by causing such an itching that they rub off the wool, and it is a source of enormous loss when it gets into sheep herds. Other animals much the same way; first, there is an itching, then eruptions on the skin; for instance, Psoroptes produce a scaly, scurfy condition of the skin like dandruff. The Sarcopes working under the skin produce severe swelling and intense itching, especially in the dog. In the human the most common place seems to be between the fingers, but it will soon spread all over if not cured. The cat develops a thick squamous skin under which the nits burrow, finally the cat wastes away and dies. In cattle it seems to be most common around the eyes, and it spreads. German authors say it is more common in horses and dogs, but not so in Canada. Here as in Europe, it is seen

oftener in horses and dogs. In Canada it used to be common among the school children.

Treatment.—Some remedy must be used to destroy the parasite, and as that is pretty hard to do, look out you don't kill the animal in so doing. Isolate the animal; if the hair is long, clip it, especially in dogs, then give a bath with strong soap and water till you get the scabs and scurf cleaned off; that will take a long-time washing; use a scrubbing brush or curry comb. After you get through the animal will be red and may be raw, but that will be all right; in an hour it will be about dry, then rub well and apply all over the surface (every part, for you must come in contact with the parasite) some Mange mixture. We find the only specific for the Mange and Itch is sulphur. All you need if Psoroptes or Symbiotes, is ointment of sulphur and lard, but for professional reasons we don't give anything so simple; we use something that works as well, and for the Sarcoptes it works better.

R	Acid Carbol.	1½ oz.
	Oil Terebinth.	1 oz.
	Oil Picis Liq.	1 and ½ oz.
	Sulphur	2 ozs.
	Oil Lini. ad to make	o i (1 pint).

Can't use this on cats as they can't stand the carbolic acid; but for horses, dogs, (from mastiff to toy terrier,) cattle, etc., it may be used freely, and rub it well in. If your first washing is thorough one dose ought to be sufficient, but it is best to repeat the application once a day, after the first wash, for four days, then friction without the mixture for four more, then wash off; if not cured then, repeat the mixture. A more common and cheaper one is kerosene and lard one to three parts, or sulphur, lard, tar and turpentine, and may or may not add carbolic acid. After curing the animal treat the places where they had been sore, then clean stables, dog houses, etc., good; wash out with boiling water and corrosive sublimate, or carbolic acid with the water, then whitewash the place, clean the harness and oil it. In Baker's Mange cure, you may use instead of the sulphur, if you are going to ship, sulphurous acid solution, say an ounce of it. Tobacco juice is very good also as a wash for Mange, especially for sheep. Arsenic dips would be the best for sheep if you turn them out on a bare place where the arsenic can't drip on what they will eat. Refer to Finley Dunn for the arsenic dip for sheep. A good sheep dip is as follows: common salt and tobacco 1 lb. each, boil for one hour in gallon of water; then add 2 drams of corrosive sublimate, and add aqua to make three gallons in all. Apply to scabby part once, and repeat in a few days if necessary. For cats or pet dogs use sol. iod. cal. brom. comp. 1 oz.; add aqua to make four ounces.

DEMODEX FOLLICULORUM.—Known as Follicular Mange, found in the dog mostly, but sometimes in the cat, sheep, horse, pig, goat, ox, deer, fox, rats, and mice. Is almost impossible to cure, because you cannot get at it.

Semeiology.—Great itching; animals will scratch and bite; in some cases in horses and cattle, a scurvy accumulation comes on skin, hair falls out more or less; in long-standing cases skin becomes thickened and wrinkles. There is a peculiar offensive odor. Use creoline pretty strong.

RINGWORM.—This is due to the presence of a vegetable parasite known as Dermatophite, it flourishes luxuriantly. The disease is ordi-

narly known as Favus. This vegetable is Cryptogenic, discovered by Nolmsten in 1845; it is usually in the skin and attacks the hair follicles. Its cells are oval, transparent, and $\frac{1}{1000}$ inch in diameter; it burrows under the skin as well as the hair follicles—gets into the roots of the hair. It causes intense itching, and forms a crust on the skin; it is very contagious. It starts in a little spot and spreads in a circle, and as it grows larger it lessens on the inside and leaves a healthy part in place. In the horse this starts about two inches in diameter; in the human this zone is about an inch.

Symptoms.—The circular form shows the growth of the disease; it itches, burns and pains.

Treatment.—Wash the part with soap and water, then apply something that will cauterize the part—as tinct. iodine clear; 1 to 8 iodine ointment. Sometimes a strong solution of corrosive sublimate is effectual, but it cauterizes; kerosene, turpentine or any kind of oil works well and doesn't burn. *Oil of Indian Corn* is good; place the corn on some cold flat iron surface in a single layer, heat a shovel and lay on the corn for a little while, then take away the shovel; the corn adheres to the shovel and the black oil is left on the cold surface; apply this oil to the Ringworm, it will sting but cure.

CONSTITUTIONAL DISEASES.

Are those that have their seat primarily in the blood; if they locate in any particular organ, then they become so secondarily. Every constitutional disease locates itself in some particular part of the body which is best suited for its development. The constitutional diseases are divided into two classes—Contagious and Non-contagious. In both of these grave changes take place in the blood, as the particular feature of the case. In contagious diseases the cause is introduced from without the body. This is spoken of as Contagium, as a generic term; this includes all the germs, no matter how introduced. In Non-contagious diseases the morbid condition arises within the body.

Diseases are contagious, infectious or specific when the disease-producing agent inoculated into a healthy animal will produce the same disease. Those agents are known as CONTAGION, sometimes spoken of as specific virus, or materies morbi. Contagious is the popular term, and is used in the generic sense to convey the idea that the disease is catching, it doesn't make any difference whether from germs floating in the air or from actual contact. Infectious has more of a specific meaning and is used more among scientific men, seldom by the public; they really mean the same thing, and are used indiscriminately; some of the best authors say they are synonymous. It has become quite popular to speak of all diseases as EXOGENOUS (as Tuberculosis) when introduced from without; and as ENDOGENOUS when from within (as Hog Cholera). The contagious are usually classified as Exogenous, and non-contagious as Endogenous. Bacteriological research has gone far in proving there is a specific germ present in one infectious disease; though there may be other germs present the disease is due to one alone; that is, every infectious, or contagious, or specific disease has a specific germ, which when introduced into the healthy animal will produce that disease and no other.

BACTERIUM (BACTERIA).—Is the generic term now applied to all kinds of germs, and BACTERIOLOGY relates to germs in general, without speaking of any particular germ. These Bacteria are divided into three large classes, and they have many subdivisions—MICROCOCCUS, i., BACILLUS, i., SPIRILLUM, a. The Micrococci are often spoken of now by medical men as Cocci; they are either round and small, or oval and larger. Bacilli are rod shaped. Spirilla are spiral or corkscrew like. These germs may occur singly or in chains, glued together with protoplasm. They are all equal in the severity of the disease they produce, as in the Bacilli which is found in Tuberculosis, Anthrax, etc.; Micrococci in Yellow Fever, Texas Fever, etc.; Spirilla in Asiatic Cholera, etc. The Spirilla are much larger than the other two; they are often found in stagnant water. When these germs are introduced into the body they go on reproducing; these Bacilli all have spores, and when the Bacilli become matured they break up into sections of spores and go on in that way, increasing in numbers. After they have been in the blood twenty-four, forty-eight, or more hours, they begin to produce a chemical product called PTOMAINES, and as a rule, or invariably, this destroys the germ itself—they can't live in their own ptomaines. In many cases if the ptomaines could be eliminated from the blood the animal would recover. In Texas Fever they locate in the red corpuscles, and their presence kills. In Tetanus it is the ptomaines that produce the trouble and death, and not the germ itself. In Anthrax it is by their great numbers; they are so numerous the blood is thickened and the ptomaines cut no figure.

As regards the placing of these Bacteria in the vegetable world, and the way we classify them as vegetables, should be understood. The earlier naturalists looked upon this germ as being animal, but now all naturalists recognize it as vegetable,—micro-organism, and differing from Infusoria, which are the single cell life; the vegetable is single cell vegetable life. They appear the same under the microscope; they are the lowest order of living things. Animal cells receive their food particles into the interior of the body, assimilate the nutritious portion, and subsequently exude the non-nutritious residue. They have an opening at each end, from mouth to anus. Vegetable organism is nourished through its cell walls, which inclose protoplasm, by organic or inorganic substances held in solution; it takes in nothing but what it needs, so there is nothing to exude. When these germs are introduced into the body, if they find suitable soil they reproduce themselves and will continue to do so and finally kill the animal; but if they don't find suitable soil they reproduce but little and soon die. Immunity from these diseases is when the germ does not find suitable soil to grow in. In the Infusoria there are no ptomaines. In all specific diseases it takes a little time after the introduction of the worm to have the disease manifest itself; this period is called the period of incubation; the time varies very much, depending on the conditions surrounding the animal and the condition of the blood as we see in Tetanus. If the germ gets into the wound and the wound closes and excludes the air, the disease will soon show; but if the wound remains open and the air gets into it, it takes about six weeks, where in the other case it may show in from one to three days. They will thrive in a temperature of from 98 to 107 Fahrenheit.

TUBERCULOSIS.—Ordinarily known as Consumption, especially in the human. It is very common in cattle and in sheep; it may exist in any animal, but the horse very rarely has it. It is most common in the human and in cattle. It is thought by some to have originally arisen among cattle, and from them spread to other animals. As proof of this theory—where there are no cows used in some parts of the world there is no Consumption, and where cattle are most plentiful Consumption is greater. Tuberculosis is an infectious disease; it is communicable from one animal to another in many ways, but the specific virus is the Bacilli Tuberculosis, discovered by Koch in 1882. He found it in the sputa of a Tuberculosis patient, and inoculation with it produced the disease wherever inoculated. The period of inoculation is very variable; according to the researches of Koch, in case of inoculation, from twelve days to several weeks; but when gotten in the natural way, may exist a very long time. It is inclined to run a mild course and terminate favorably. Koch discovered that these Bacilli would grow in any part of the body where they were planted. In the natural way they most always affect the lungs, as they are taken in by respiration, but they do not always affect the lungs even when gotten that way. Hamilton mentioned many parts of the body where he had found them, even in the iris of the eye and in the aqueous humor, and in the bones; but the choice of places is in the lungs; next place the pleura, then peritoneum, pia mater, arachnoid. Muscular tissue has almost complete immunity from them, that is in the natural way. Where they occur in the muscles it is the result of direct inoculation. The organs most affected are the lungs; second, the spleen, then kidneys, liver, then the brain. When they exist in one part of the body they are apt to spread to other parts; we often find them exist in a dozen different places in the body. In the lower animals they don't affect the bones very often, but do in the human. Scrofula is often nothing but Tuberculosis.

Etiology.—The Bacilli are most often found in the sputa of patients; the most prolific way of getting it is from the sputa that is thrown on the floors or ground; in drying it is ground up and the germ floats in the air and is inhaled. The disease can't be had without the germ; sometimes it is found in the fæces and in the milk from females, particularly from the cow, as the mammary glands are then affected with the disease. Another way is through the food—eating infected meats and milk.

Special Pathology.—This would come more under the head of Pathogeny. The first step is the discovery of the germ that is introduced into the stomach in the food; the tissues of the stomach are rarely affected so they pass into the intestines, which are also rarely affected, thence pass into the blood and are then lodged in some part of the body. Hamilton says they go in colonies of three, five, nine, usually five; they locate in some place and begin reproducing themselves. This sets up a little localized inflammation that is slight in extent, the result of this is degeneration of the little spot; usually this degeneration is caseous, may say it is a phenomenon of the disease. Sometimes this degeneration is fibrous, sometimes hyaline; this spot is the tubercle, and usually starts in little isolated spots or circumscribed tubercles, from the size of a millet seed up to .318 of an inch in diameter; probably all are of the

size of the millet seed in the start, but as they involve other tissues they grow. There is a little exudation and slight formation of neoplastic tissue as a result. This tissue is nearly always fibrous at first, then in the course of a few weeks or months, if the germ is not too active in the tubercle, a deposition of calcareous salts takes place in this fibrous capsule that has been forming. This you might say incloses the tubercle in a stone wall perfectly impervious, which renders the tubercle inoculated forever. This is the course of a mild case that terminates favorably.

The reason that the germs we often inhale don't cause Consumption, is due to this calcification. This feature of calcification is very important—it is another phenomenon of the disease, and is diagnostic; sometimes we say taking another form of the disease. The Bacilli remain very active, increase in numbers very fast, and other colonies start; the tubercles spread rapidly, and before death may be in ten or a dozen places. In case the Bacilli take on such great activity, we get inflammation of the spot, followed by ulceration rapidly; this differs from calcareous formation around the capsule; there is no end to this ulceration except death. It spreads very rapidly—sometimes Quick Consumption may be in six weeks, other times will hang on for years. The tissues of the lungs are destroyed and blood vessels are eaten in two, and this causes the hemorrhage of Consumption; the sputa is degenerated caseous matter, it has no nuclei. In very extensive cases, if the caseous matter is not inclosed in the calcareous matter, may become softened and liquify; cases have been where the whole contents of the sacks or capsules were liquid. This disease is usually divided into several stages—first, is the caseous, no inflammatory process, only caseous; second, exudative stage, and forming of the fibrous capsule; third, stage of ulceration; fourth, is the cretaceous when the lime salts are deposited around the caseous matter. When this exists to a great extent, inclosing the miliary, it gives the lung a peculiar look—as little lumps of chalk. The cachexia that accompanies the putrefactive matter is absorbed and distributed through the blood poisoning it. When it attacks the skin in the form of Lupus, it produces a circumscribed swelling on the surface.

Diagnosis in Autopsy.—Suppose you never saw the animal in life. There are six or seven diagnostic features; first, the presence of the miliary tubercles or nodules, usually multiple, either running in lines, arranged in groups, or evenly distributed through the organ affected; second, the little nodules are a general eruption of very even size, usually about that of the millet seed; third, these nodules or eruptions are round in shape, with border sharply defined. Fourth, they have an almost cartilagenous lustre and hardness; fifth, they can be easily dissected out from the tissue; sixth, the color is usually gray, but when caseated is more of a creamy yellow,—this may refer to the cut surface or the outside. Then in bad cases it takes three forms—first, caseous; second, fibrous; third, hyaline; this is the order in which they most frequently occur.

Semeiology (say a cow).—The first thing is a husky cough; oscultation and percussion in bad cases will reveal a semi-solid sound; a dullness can be located if not too fat. In a mild case, or in the early stages, there is little or no constitutional disturbance, but when the system be-

gins to suffer from the cachexia the appetite becomes capricious, sometimes completely lost; emaciation takes place, sometimes very extensive. In this stage Lupus sometimes develops, often suddenly; large tubercle patches often occur broadside, on the ribs and skin; Hydrothorax is a common complication, towards the last general debility and death; this takes place as the immediate result of an exhausting Diarrhœa. Hogs, also people, develop about the same.

Treatment.—Generous feeding of very nutritious food, oleaginous as possible and fat-producing, and fat itself, so give linseed meal in the shape of ground oil cake. In the human, cod liver oil and fat meats, good nursing and correct hygiene.

Prophylactic Treatment.—We believe it is infectious, and if the meat is eaten will produce the disease; this in the human produces Phthisis Tuberculosis, particularly from drinking the milk of an affected cow. Try to stamp out the disease by destroying the affected animal. In doubtful cases they are using Tuberculine to prove if an animal has Tuberculosis, by injecting this under the skin; if there is any Tuberculosis present it will set up a severe Systemic Fever that will last several days and cause a fresh attack by the Bacilli. You can get this only from the Veterinarian in charge of some experimental station; they get it from Washington, from the Bureau of Animal Industry. If there is no Tuberculosis present there may be some fever set up with this, but it wont be severe, and will soon pass away. If you inspect meats and see any ulceration from this disease—condemn it; if there is calcification and no ulceration to be found, then it may pass. But beware of the milk or meat of a coughing cow.

RINDERPEST.—This is an infectious disease, and is exclusively a bovine disease; it originated in Russia and spread to the other European countries except England; it has never been in this country. The mortality of the disease is forty per cent and upwards. The period of incubation is about two days; that probably accounts for its not having spread more, as it develops so quickly. At the end of two days a high fever sets in, the mouth is studded with pustules, mucous membranes of the body are congested, skin becomes affected by the formation of epithelial concretions, and desquamation of these occurs in about twenty-four hours, leaving a pink erosion, almost raw surface, the skin in other places becomes greasy; the appetite is lost, rumination is suspended, milk dries up, the urine is scanty and high colored; there is a foetid Diarrhœa, and accompanying it there is painful straining; saliva dribbles from the mouth, the back is arched, the head droops, eyes are watery, mucous membrane (particularly the rectum) gets purple, respiration is performed with a grunt, whistling is heard in the chest, by auscultation, and on percussion the chest is abnormally drum-like; there is sudden lowering of the temperature, and death takes place usually in from seven to eight days.

Treatment.—Is useless and should not be attempted. Stamp it out by destroying all infected animals and quarantining all the exposed ones; burn the carcasses and everything used around them, and fumigate the stables.

PLEURO-PNEUMONIA CONTAGIOSA, (Contagious Pleuro-Pneumonia).—This is the most insidious, stealthy disease we have anything to do with, and the period of incubation is so long it makes it dangerous, as it

can be carried so far before breaking out. The history of it was that wherever it started or got in, it never was gotten rid of except in this country. It is a disease of the chest, lungs and pleura. It has existed in Europe from time immemorial, in England in 1840, and it is there yet. It came to this country in 1843, by importation of cattle from England and other parts of Europe. In the early summer of 1884 it was brought to Ohio from Baltimore by a Jersey cow, and from there it came to Illinois and to other states, among them Kentucky and Missouri. In the fall of 1884 Dr. Baker, with the State Veterinarian, ran down the last one, as they thought, and had them destroyed; but two years after they discovered some again, thousands were found affected and destroyed. The period of incubation, according to their experiments, is a minimum of seventeen days, and on the last may be fully developed; then from that up to several months, known repeatedly to be two months. Up to '83 it had never been known west of the Allegheny mountains, but before that it had been in the new England States. It is not always fatal; in some herds there may be a mortality of 90 per cent, in others as low as 20 per cent, but 60 per cent is about the average. Some authors think it is a non-recurring disease, but Dr. Baker and others in this state found sufficient proofs that it would recur; he found cases that showed proofs in autopsy that the animal had had the disease before, and recovered; in fact he found all the different stages of the disease in some cases in the one animal. Dr. Gaskins, a retired Vet. of Philadelphia, believes as does Dr. Baker; he has come to the conclusion that many of the spontaneous outbreaks in Europe were chronic cases; that is cases that were called recovered ones, but the disease had only broken out afresh in them and was communicated to the rest of the herd. In chronic cases the contents of the capsules liquify and get thinner and thinner, and finally rupture the capsule and allow the contents to get out and the animal is attacked afresh with the same disease it had recovered from. In England they don't destroy exposed cases, only quarantine them; hence they keep the disease among them. There is none of it in this country now, that is known, but it is liable to be imported. Breeding stock has to be quarantined for ninety days, and in Canada before entering.

Semeiology.—Is divided into two stages; the first lasts from two to six weeks; it comes on with an assiduous fever, varying from 102 upwards; usually starts out at a slight elevation of one degree, but may run up to 107. Among the animals Dr. Baker experimented with, they took the temperature every day; at 102 the animal was considered sound, but at 103 affected. As the fever increases the appetite will be lost, but in very mild cases they never lose their appetite. There is a short husky cough. If they are running at large, the affected animals will isolate themselves from the rest of the herd, with back arched, drooping head, unthrifty appearance, and staring coat. Rumination and secretion of milk are suspended, but that will happen from any fever; the breathing presents all the symptoms of sporadic Pleuro-Pneumonia—nothing diagnostic in it; in a typical case the expiration is performed with a grunt; they are constipated, from impaction of the omasum; nose is dry, nostrils dilated, pulse rapid and weak; horns hot at the head and cold at the tips; oscultation and percussion disclose all the symptoms of the sporadic disease. Prof. McEachran said the left lung was oftenest

affected where only one was affected, but Dr. Baker and other authors say oftener in the right lung, and their theory has been proven to be better than McEachran's. During the acute stage the disease is most infectious. The second stage is characterized by an aggravation of all the symptoms, marked particularly by the hepatization of the affected lung, and Hydrothorax in the cavity. The pulse during this time may work up to 80 or higher, and follows the same rule as in the sporadic disease; breathing is harder and cough aggravated, and mucous rales are heard in the bronchial tubes. When Hydrothorax takes place rapidly, as from twenty-four hours or a little more, there would be no œdemic swellings or enlargements; but in most all cases you will see œdemic enlargement outside of the chest. In many of these cases there was only Pleurisy, in others only Pneumonia. In some of these cases of Hydrothorax the swelling would reach to the head and neck and down the sides; there is grinding of the teeth, and towards the last Tympanites (acute) seems to set in and may be the immediate cause of death. We conclude this Tympanites is degeneration of undigested food. Often there is a fœtid discharge from the nose, and sometimes Diarrhœa; but in most cases Constipation existed. The absence of diagnostic features during life throws us back on history of the case; no expert could diagnose a single isolated case; we don't think there is one single diagnostic symptom, but the history will usually arouse our suspicions, and autopsy will show the lesions, so when you see this disease breaking out, as it sometimes does in warm weather (without any cause), you will suspect the disease, and autopsy on one that dies will show you.

Post-Mortem.—On opening the chest we find more or less serum, though that is not diagnostic of the contagious Pleuro-Pneumonia, as it is in the sporadic disease. You will usually find adhering to the costal and pulmonary pleura a coating of coagulated serum, the quantity and hardness of which depend upon the time the animal was sick; say the animal was sick four, five or six weeks, you will find the coating is all the way from a quarter to an inch thick. When it is an inch thick it is clearly serum coagulated; but when it is quarter of an inch thick, you will notice it has taken on a considerable amount of organization, which is mostly coagulated lymph instead of serum; it forms a sort of a false membrane. This is looked upon as quite an important fact, because the false membrane in the sporadic disease differs from it—it is not so firm, and the animal does not live so long. In many acute and some chronic cases, adhesion between the lungs and the ribs will be found to a greater or less extent; it may also be found in the sporadic case, but is not so extensive, and is not always found. In the contagious form, where in its acute stage it was mostly Pleurisy and not enough to kill the animal, we found very extensive adhesion, in some cases the whole of one side, and without much Pneumonia being present. In the contagious form there is often adhesion between the lungs and the diaphragm, while almost never in the sporadic form. As a rule when you find an adhesion between the lungs and parts, you will find hepatized Pneumonia in the third stage in the lungs at that point. You will also notice that the intercostal spaces are darker red than in the sporadic cases. Lungs may be larger or smaller, heavier or lighter, according to the amount of Pneumonia, but where there is only one lung affected, and in an exceedingly

severe case, the weight of a single lung, say of a 1100 or 1200 pound cow, would be 50 pounds; that shows the amount of consolidation that can take place in these cases. Then again the lungs may appear healthy when you take them out, but on manipulation you will find little hard spots. We'll say the animal dies in the acute stage of Pneumonia. In the third stage there is a complete hepatization; cut this lung across and it is solid, more so than liver; the cut surface is extremely well mottled. In the sporadic kind it is somewhat mottled in the cow. This mottled condition is due to extensive exudation of lymph into the interlobular connective tissues, and forming the yellowish white bands which are about $\frac{5}{8}$ of an inch wide; this exudate infiltrates into the interlobular tissues and organizes, say in a case of three weeks. These interlobular bands in a recent acute case are whitish-yellow, while in an old case, say of six weeks, the bands show a creamy white—they seem to grow whiter with age, while the lobules are very dark, some are absolutely black, and the color will vary from that to red—the red is from hepatization. This makes the lung very beautifully mottled. In the other part of the same lung in the second stage you diagnose that by dropsical or œdemic condition; the swelling pits on pressure, while the hepatization is solid as a brick. Cut this swollen part and you will find it loaded with serum, more so than is ever found in the sporadic case. It is somewhat œdemic in the second stage of the sporadic case; perhaps a little farther in the same lung you may find it in the first stage, so that these are some of the conditions you may find in this contagious disease.

This is diagnostic—finding the different stages in the same lung at the same time. When the Pneumonia is limited in extent the termination of it is very abrupt, except that a little hyperæmia may extend into the sound tissues, say about $\frac{3}{8}$ of an inch, while in the sporadic case the inflammation fades imperceptibly into the healthy tissue of the lung and is more diffused. In the contagious form the white lines become enormously thickened both ways, so that the lobules in this case are smaller than in the sporadic case—they are encroached upon by the fibrous bands. There is proliferation going on of the interlobular connective tissue and organization of the exudate. You may find the black spots among the red, but you don't find the red among the black. If there is not enough Pneumonia to kill the animal, this localizes or is localized Pneumonia; it will become inclosed in a fibrous capsule; the capsule is formed by a localized inflammation, exudation and organization; the capsule is on an average $\frac{1}{4}$ inch thick. This capsule is peculiarly diagnostic; it is never seen in the sporadic case, because the abrupt line so well marked in the contagious is not that way in the sporadic. If more than $\frac{1}{3}$ of the lung is involved in this capsule it is liable to kill the animal, in the acute stage. There is a capsule that forms in Tuberculosis, but no need to mistake it for one of this kind. In Tuberculosis you never get Pneumonia in any form, consequently never get hepatization; but instead get the caseous matter. In Tuberculosis the capsule has more or less calcification (calcareous deposit) in it, and never in contagious Pneumonia. In contagious Pneumonia the lymph glands throughout the body are more or less swollen—not so in the sporadic. The contents of this capsule liquify after a while, sometimes $\frac{1}{3}$, $\frac{1}{2}$ or $\frac{2}{3}$ of its contents

is liquified in the course of a year. Still you may find complete consolidation in the fourth stage, without a particle of liquification after three years; but in the average case over a year old, the contents of the capsule begins to liquify. There is no limit to the size of these localizations of Pneumonia, we often find only one lobule affected. These spots or places are inclosed in the capsule, and may be from the size of a hen's egg to that of a man's fist.

There is an immunity from the disease rendered by the fever, but God only knows how long that immunity may last; but we know inoculation does render it so for an indefinite time. In some cases that Dr. Baker and the state authorities had destroyed, they found capsules that were apparently a year old, and at the time they were killed they had a fresh attack, which proved that the disease could be taken a second time. But it must be admitted that inoculation of cattle with the serum of diseased cattle will cause Systemic Fever, and will render the animal free from danger for a year probably; but immunity has been strongly believed in in Great Britain, and as a result they still have the disease among them. They inoculate and don't destroy recovered cases, as they call them. The way to inoculate is to kill an acute case at such a time as you expect they are in the second stage, that is some portion of the lung; then puncture this lung, get some of the serum from it (a single drop will do), get hold of the tail you wish to inoculate, part the hair, cut the skin, and with a stick put a drop in the cut—this will produce Systemic Fever and insure immunity for three or six months anyhow. This will not produce any lung lesion. this serum is so poisonous that a drop in any other place in the body will kill, or even if put in at the base of the tail; and the tail inoculated will become gangrened and drop off; so if you see a lot of stub-tailed cattle you will know the cause. The danger of inoculation is in allowing cattle to go out with a little hepatization as sound meat; this risks causing an outbreak in some place. That would be by the contents of the capsule becoming so liquid, and finally the capsule rupture allowing the contents to escape may get into the bronchial tubes or lungs and cause a fresh attack. This explains spontaneous outbreaks. A severe case dies; a moderate case that got well, McEachran said, was useless, though Dr. Baker saw cases that seemed to recover and were bred after and dropped a calf, and were good milkers and fattened well, and their calves were healthy and strong. This disease is not communicable to man or other animals than the bovine; Dr. Baker said, they handled the serum without the least danger.

Treatment.—Is useless; quarantine the herd. Illinois law places the distance, when outside, at 300 feet between herds, but inside, 1500 would not be enough; good plan to destroy everything that had been exposed. If the state has no law governing these cases, the U. S. government steps in and takes charge; but where the state has its own law the U. S. takes a second place in the matter. The meat of a chronic case where the capsule is small and the animal healthy otherwise, is allowed to go upon the market; the meat is tagged and when sold, the money is turned over to the owner; but where an animal is destroyed and the meat condemned, the owner was paid one third the value of the animal. The hides were saved, salted, allowed to dry, put in a semi-air tight box wagon and taken to the tannery. If a herd is quarantined,

say for a month, it is well then to inoculate them—that may save many of them. This disease is very infectious, but it will require a living, diseased animal to convey the disease to healthy stock; it can't be given by parts of a diseased carcass, as proven by experiments. Dr. Salmon believes it can be got by placing a healthy animal in the place where a case had died from it. So far no germ has been discovered for it.

EPIZOOTIC APHTHÆ (Foot and Mouth Disease).—This is an infectious, eruptive fever called Aphthæ, because it affects the mouth particularly. It is a form of contagious pustular Eczema. As we see it, it affects cattle; but not confined to cattle alone; sheep, pigs, dogs, cats, chickens, and rats can have it, and occasionally the human; but it is of no consequence to us except in cattle. It has been in Europe for over 2000 years; was introduced into England in 1839, into Canada in 1841, and from there to the United States; but as the number of cattle was small, it was soon stamped out. The seat of the disease is in the mouth, in the dental pad, tongue, or any of the mucous membranes of the mouth; but it seems to require direct inoculation to be in any particular part or place. The foot becomes affected in the interdigital spaces; also the udder becomes affected, presumably from the hind feet when the cow is lying down. This disease has never been in the West, but has been in Maine and Mass., and in Canada one half dozen times, but it was always quickly recognized and never allowed to spread.

Etiology.—Lies in some Contagium, which seems to exist in the saliva mainly, and also in the feces and urine; but there has been no germ yet found for it. The period of incubation is from 24 hours to three, four, or six days; the virus is very active. The disease usually runs a benign course and terminates favorably, but is sometimes malignant; in that case there is eruption, ulceration, gangrene—causing extensive sloughing; this around the joints sometimes causes opening of the joint, sometimes sloughing off of the digits, sometimes sloughing at the fetlock, or in the joint below.

Semeiology.—This disease is divided into four stages; first, is Fever; with it will be found staring coat, rigor, elevated temperature, often seen as high as 107; dullness, nose dry, horns hot, milk diminished, urine scanty and high colored; all these are ordinary signs of fever, but there is a special symptom—the mouth is full of saliva. This stage lasts from twenty-four hours to two days. Second stage is eruption; the feet swell, and are hot and painful to the touch; animal is very lame, and where the four feet are affected he goes like a foundered horse. Vesicles appear on the dental pad and other mucous membranes in the mouth, sometimes extending over the face; may be on the vulva, escutcheon, over the udder, etc. As soon as eruption takes place the temperature falls, comes down as low as 102 or 3; the saliva in this case dribbles from the mouth, so the animal keeps up a peculiar mopping or sucking sound. The appetite, if lost in the first stage, now returns, but the animal grows thin—he is unable to eat because of his sore mouth. Third stage is Ulceration; the vesicles fill up, rupture and discharge, and in a severe case, if the vesicles are close together, they will become confluent, then do great harm as these confluent ulcers form large open sores, often very deep, causing gangrene and sloughing, sometimes

sloughing off of the hoofs. Fourth stage is that of Desiccation, when the ulcers dry up and heal, usually leaving the animal as well as ever; but this takes a long time, if you get flesh on him. As to the length of time necessary to keep a herd in quarantine, all agree on at least three months, and at the outside, to be safe, six months. Prof. McEachran said he had known it to break out after a Winter's exposure in Scotland, so it is very difficult to say how long to hold them. The means of transportation of the disease from one herd to another may be on the attendant's clothing or utensils, or by blankets; or rats, dogs, or poultry may carry it from one herd to another. One redeeming feature of the disease is, that it requires actual inoculation to produce it; so a healthy animal five or six feet from a diseased animal may not be affected. The disease is first in the saliva, then by dripping on the ground the feet become affected; that is secondarily.

Treatment.—Inoculation is practiced in some countries, particularly in England; it is simply to have them all affected at the same time and be treated at the same time, and not have them lingering one at a time; but it does not lessen the severity of the disease. Treatment doesn't affect it much, but keep clean, and use antiseptics on the ulcers; that may lessen the ulceration and sloughing; use soap and water also. Salicylic acid or powdered boracic acid, applied dry to the ulcers, is good. Borax, glycerine, and honey make a good wash for the mouth. If the ulcers are indolent, touch up with lunar caustic, or tinct. of iron; feed sloppy food, and disinfect everything connected with the place. After the disease has disappeared keep the animal in quarantine several months. Some say it renders them safe from another attack; it may for a good while, a few months, or a year, and after that they are liable to a new attack.

The mortality is small, but the loss is heavy—in dairy, from loss of milk; in feeding-cattle, from loss of flesh, and in pregnant animals, from Abortion. To prove a doubtful case, as to its being this disease, draw a wisp of straw through the mouth of a diseased animal, then through the mouth of a healthy one, and in the course of 24 hours it will show proof. In an outbreak in Kansas supposed to be this disease, the strong features of it were that a lot of cattle were affected with a disease of the mouth and feet; there were vesicles and ulcerations, feet got sore, and in many cases there was extensive sloughing and consequent loss of hoofs; but statistics proved that often one third of a herd was affected, the others not affected; poultry did not get it, adjoining herds were not affected, and the strong ones only had it, or at least in a severe way, compared to the weak or puny. It was proved to be Ergotism, from feeding on hay that contained ergot, and the strong ones fought the weaker ones to the edges of the place where they fed, and so these got less to eat. This hay was made on bottom lands. At the same time there were cases of Ergotism in Illinois, aggravated also by the wet, freezing mud the animals had to stand in. A new cattle disease sprang up in the State of Illinois a few years ago, suspected to be a Foot and Mouth disease. Dr. Casewell, State Veterinarian, Dr. Williams, of Bloomington, and Dr. Baker were appointed by the Live Stock Board to investigate, and they concluded it was a disease due to some poisoning they got while on pasture, from the hay or grass they had eaten. They had many of the

symptoms common to the Foot and Mouth disease, and on autopsy they found the internal organs—as colon, duodenum, etc., very much cauterized in patches, and also the stomach. The outer part of the udder would be affected in such a way, showing that it was from contact with the ground while lying down. McEachrans lotion for Foot and Mouth disease is sulphate zinc, alum, glycerine and a little carbolic acid; but don't use carbolic acid on the udder.

TEXAS FEVER, or SPLENIC FEVER.—This is indigenous to the states, and particularly counties bordering on the gulf of Mexico; all that low country is affected with it all the time. There are certain lines that may be drawn abruptly; as it recedes back from the Gulf, might say at the foot hills. We find on examination that it is an infectious fever, peculiar to cattle. It can be communicated to Northern cattle by Texas cattle being brought North during the summer months, and by cattle passing over the same ground that Texas cattle had passed over. It is sometimes started among cattle in this state by buyers getting a Texas animal among the stock they buy, and not being aware of the Texas steer among them. The period of incubation is from eight to sixty-four days. We find the source of communication to be in the lines of commerce; the Northern cattle get it if they go wherever the Texan has been—in cars, boats, stock pens, pastures, etc. Sucking calves have been noticed to have immunity from the disease, so the milk must not be affected; Dr. Baker thinks they do have it, but probably in a very mild form. Dr. Billings claimed to be the first discoverer of its origin being in the tick, and though Dr. Salmon says to the contrary, proof is in favor of Dr. Billings. You can get the full report of the disease in the Government Report Bulletin number one. Dr. Salmon claims that the tick is the only means of communication; heretofore it was supposed that the saliva dripping from the mouth of the Texas cattle fell on the grass, and that the northern cattle became affected by eating it. Old stockmen said it came from eating green fodder, but Dr. Baker, with Dr. Casewell, proved that cattle that came in contact with Texas cattle, or the place where they had been, took the fever; and in their experiments they found the period of incubation to be from eight to twelve days. Dr. Salmon says that by inoculation it will develop in six days, and from that time up. We found in the outbreak in this state that some would run sixty-four days, and made thirty-one days as about the correct average, as fully nine-tenths of them took it between twenty-eight and thirty-five days. The name of the tick is *BOOPHILUS BOVIS*; it is a blood-sucker, and lives by piercing the skin and sucking the blood, and it becomes thoroughly infected with the disease—even its fæces and ova become infected; then the female drops to the ground, lays her eggs and hatches out young ticks, and as the cattle lie down they get on them, or the fæces on the ground from them may affect the cattle. As an argument about the tick being the only means of communicating it—the tick is affected, hence the blood is affected, the fæces is affected if the tick gets into it so the animal must have its blood affected, and why not the fæces of the bovine, the urine also, for that is always bloody, that is in the acute cases; so from this I hardly think Dr. Salmon is right in saying the tick is the only way it can be communicated. It has been found on investigation that this germ invades and inhabits the red corpuscles of the blood and de-

stroys them. The corpuscles when invaded by the germ show little black spots seen under the microscope; it may be in the center, or any other part of the corpuscle, and there may be two or three of these spots in the same corpuscle.

Semeiology.—There is nothing very peculiar about it; there is high fever, anywhere from 104 to 110, but where we found it 110 the animal was exposed to the hot sun without any shelter; they are dull, the ears droop, the back is arched, and the feet drawn close together, cough more or less, but not invariably; there is trembling of the muscles of the flanks, sometimes of the neck and shoulders; horns hot at the base, cold at the ends, appetite and rumination completely suspended, emaciation and weakness come on rapidly—if in pasture will lie down in the water; fæces lessened in quantity and often streaked with blood or covered with slime, urine often nearly suspended, and what is passed is a very dark red; it contains albumen and the coloring matter of the blood, but not blood. The mucous membranes become congested and dark, and towards the last become a yellowish brown, finally animal gets weaker and weaker, goes down and can't get up, and when down he dies, being in convulsions five or ten hours; they die in from four to fourteen days, mostly on the fifth. The mortality is very heavy; in the ordinary cases the mortality would be sixty per cent.

Treatment.—Like other specific diseases, treatment is merely towards amelioration; the only way a specific fever can be cured is by its being limited and the poison dying out. If the Ptomaines that kill the germ are limited, the case will be mild and chances for recovery good. If large and severe the animal will die. In this fever antiseptic drenches are useful, such as a solution of hyposulphite soda or sulphite calcium, and as demulcent, for the kidneys give linseed tea; give green food, especially green corn; it has been found that more cases recover when turned into a field of green corn than otherwise. Watch the symptoms, and if needed give stimulants.

Preventive Measures.—Separate the healthy from the diseased ones, don't take a Texas steer with them, leave him with the others; you can often tell them by their coats when not by the horns. Texas cattle should not be allowed North between frosts, that is during the Summer months. Frost destroys the germs or Contagium, so there is then no danger, that is of infection; in the Summer time it is liable to break out any place along the trunk lines carrying the Texas cattle, by the dung being kicked out of the cars while passing and the germs getting on the grass. Texas cattle now have their own place in the stock-yards, where no other cattle are placed; they are never mixed, and they must be carried there direct by the railroads before getting out of the cars.

Post-Mortem.—Is quite characteristic, no danger of making a mistake. On opening the abdomen the mucous membrane is studded with cachexia, little red spots about the size of a pin head; in this it may differ from Ecchymosis; these little spots sometimes become confluent and form Ecchymosis. You will find the spleen immensely enlarged—from four to ten times its usual size. Its normal weight is about $1\frac{1}{2}$ lbs., but in this disease it sometimes weighs from 6 to 10 lbs.—this is invariable; it may be seen in Anthrax also; it is easily punctured and broken down, liver is enlarged and softened, kidneys enlarged, congested, and in a state

of interstitial Nephritis; omasum is always impacted, abomasum and duodenum is always more or less inflamed; gall bladder is distended with a thick gall, urine in the bladder looks black, as if bloody, but this is due to the pigment of the blood. There is more or less Enteritis all through the small intestines; the adipose tissue, especially around the kidneys, is a reddish yellow; blood is dark and thin. Any one of these symptoms would not be enough, but they are nearly all present always, and the strong features are the enlarged spleen, Nephritis, and bloody urine; the others go to corroborate it as Texas Fever.

VARIOLA.—According to the genii to which it belongs, it is named EQUINIA, VACCINIA, and OVINIA, and in the human, SMALLPOX; there is the Chicken-Pox also, which is communicable to the human. All kinds of Variola are related—all are of the same nature. They are all infectious, eruptive fevers. The Contagium is both fixed and volatile, either floating in the air or by actual contact. The germ is a Micrococcus, except in the Variola of the sheep, which is a Bacilla. The Variola of one genii is communicable to animals of another kind by inoculation, also more or less through the air—the Smallpox of the human particularly. The Variola of the lower animals seems to require actual contact is order to communicate it; yet Cowpox is recognized as being communicable through the air also. One attack of any of the Variola, except the Chicken-Pox, will render the animal exempt from another attack; and even Chicken-Pox may to a certain degree. It is through this phenomenon that vaccination is practiced; its value was first discovered by Dr. Jenner in England in 1775, by noticing that milkmaids during an epidemic of Smallpox were free from the disease, and on inquiry he learned they had had attacks of Cowpox while milking. Civilized countries have practiced it more or less since then, and the more civilized ones have laws that make it compulsory to be vaccinated. It was said by some authors that this disease originated in the Grease Heel of the horse, but this has been proven as absurd. In mild climates Variola runs a mild course, except that of the sheep, which is nearly as severe as that of the human Smallpox, but we have never seen it in this country. Variola runs a definite course; first, is Simple; second, is Vesicular; third, is Pustular; fourth, Scab. In cattle it usually appears on the teats, udder, sides of the belly, escutcheon, vulva, and on the flanks. In the horse, usually on the head, face, lips, neck and legs. The STOMATITIS PUSTULOSA that Williams describes, we have no doubt is Variola of the Equine. Sheep usually have it on the inside of the thigh, vagina, and anus, and it is the same in the cow.

Human Smallpox seems to attack the face particularly, though it attacks the body also—there is no part exempt. In hot climates the Variola of the sheep is very malignant, but the Variola of other animals is very benign. The three degrees of severity in the human are: Smallpox, the light Varioloid; then the every-day Smallpox, and the Hemorrhagica or Black Pox, in which the blood settles in patches under the skin; this is fatal ninety-nine times out of a hundred. The Varioloid is very mild. The Sheep-Pox often takes this Hemorrhagic form, and is usually seen in hot climates. The horse Variola is more severe the farther north it goes. It seems that Smallpox oftenest attacks those filthy in habits or places, and seldom affects those who bathe regularly and keep their clothes and themselves clean. It is supposed Variola originated with

one animal and was communicated to others, and took the form common to each specie. If there is anything in it, I would think it arose with the cow. It seems to arise spontaneously, especially in cattle, but as its origin is a germ, it could not be spontaneous; it is absurd to say that any specific disease due to a germ can arise spontaneously. In many cases Variola from the Chicken-Pox to the Smallpox of the human takes an epidemic or epizootic form, and in some particular seasons; why, is not known, but some, Dr. Baker particularly, think it due to some meteorological disturbance.

Semeiology.—Variola of the cow, as a typical illustration, is a simple one that arises on the base of the teat; first arises as a little red pimple, and around this pimple for a day there is more or less swelling, may be anywhere from one half to one inch in diameter, about an average of three fourths of an inch. It is usually round on the udder, belly and other parts, except on the teat, where it is oblong parallel with the teat; it is purple and of the size of a pea. In the course of three or four days the swelling at the base gets large, and in the center of the pimple a vesicle forms and fills with a clear limpid fluid; this vesicular stage lasts a couple of days, possibly three, but after about twenty-four hours the fluid in the vesicle gets turbid, becomes thick, and turns to pus; this constitutes the pustular stage. Where the vesicle is not ruptured by any violence it turns to a pustule in from forty-eight to sixty hours, then it ruptures of itself and the pus escapes; other times it dries down and forms a scab without any pus escaping. The last five or six days of the pustular stage, with the three or four first days, make about nine or eleven days, then you have a more or less heavy scab according to the severity of the case—the milder the more thin it is and smaller. This scab drops off any time between fourteen and twenty-one days, and each scab leaves a shallow, smooth, oval pit, sometimes it is round. It is quite red in color at first, then this color gradually bleaches out, so that a person after recovery from Smallpox often remains a bright red color for months. The base of the pimple in the disease is first red, then gets yellowish as the disease progresses. Cows very frequently have this disease, and it is carried from one to another by milking during the vesicular form; the vesicle is ruptured and the fluid flows over the hand, and the milker is inoculated.

The period of incubation of all kinds of Variola is from seven to nine days, usually nine, but by inoculation may be as short as three days. It is during the vesicular stage of Varioloid vaccine that the ivory points are charged; the fluid in the vesicle being limpid for twenty-four hours, after that time has passed it is not safe to use for the contents become turbid, then turn to pus, and is liable to cause blood poisoning; so the points should never be dipped after twenty-four hours have passed from the time of the formation of the vesicle. The way it is done is to take a six or nine months'-old calf, inoculate it in four or five different places, then as soon as the vesicles form, tap them and dip in the points. As the fluid becomes turbid it seems to be absorbed, the vesicle caves in, the skin rots and pustules form, and then the scab forms.

The symptoms in the horse are nearly the same as in the cow, except that the pimples, vesicles, and pits are smaller, but it runs the same course and terminates the same way. It may be carried to them by

attendants, or on the bits, or in the drinking water and many other ways, and it spreads rapidly; usually you can see, under the lip and in the mouth, a large crop of vesicles. In the human it doesn't differ at all from Cowpox. There is more or less fever in all Variola, considerable in many cases. In the first stage in the horse the fever may be 103 or 104; in cattle not so much. In the human the fever subsides as the eruption takes place. This eruption itches very much usually. In Smallpox they aim to keep the patient cool, as that relieves the itching; there is less tearing off of the scabs then, and less pitting.

Treatment.—Being specific, it has a specific course to run, and that course is invariable through the four stages or degrees; but treatment to lessen the irritation is proper, so cooling antiseptic lotions are the thing. Black Smallpox is not susceptible to treatment; ninety-nine out of a hundred die. In cows the only treatment needed where the teats are sore and can't be milked, draw off the milk with a milk syphon, then use petrolatum or acetate lead; or the best thing is a preparation called Campho Phenique; it is a regular preparation in the U. S. P., and is an elegant remedy, both anodyne and antiseptic. It may be applied clear once a day. In very bad case on the cow's bag and teats, bathe with warm water; in horses, to lessen the local inflammation, wash out the mouth with borax, or camphor and honey, or chlorate potash, or boracic or salicylic acid. To prevent its spread, isolate the animal, keep everything separate for him; make attendant wash before going to another animal, and clean stalls with boiling water and a little carbolic acid. In Sheep-Pox, follow the same rule as in the others. In severe cases the eyes sometimes burst, and blindness follows; the wool drops out, skin gets thick, and fissures break in it. If they recover, the wool never grows again in the pits. The benign case is the same as in other animals, but the wool will not grow in these pits either. Ovation is practiced in some parts of Europe instead of vaccination, but that being a Bacillus, it is not desirable.

RABIES (from Rabio, I rave,) in the Lower Animals; in the Human It Is HYDROPHOBIA (which means a dread of water).—This term seems appropriate to the disease in the human, because the sight, and more particularly the sound, of running water seems to excite or aggravate the symptoms very much. This is not so in the lower animals, but it is a well-known fact that Rabies in the lower animals and Hydrophobia in the human are identical. Rabies is a peculiar specific disease, producing an excessively nervous condition; it is contagious by inoculation only. This inoculation usually takes place through a wound or an abrasion, but it may occur by absorption from the cuticle, or from the mucous membranes. It was formerly supposed to arise spontaneously, especially in the dog or cat; it was supposed also to have originated in these species; but although so far no germ has been discovered, it is known to be a specific disease, and the idea of its arising spontaneously has been abandoned. It is very common among the canine and feline races; we know it is common in foxes and wolves, also among lions and tigers. It has been known from the earliest writings, and in some of the older countries it has existed at times as an Epizootic.

Etiology.—Though no germ has been discovered as yet, it is known to be specific, especially as inoculation produces it, and with it a specific

fever. It is usually the result of the bite of a rabid animal, usually of a dog or cat, and is communicable to other animals, both man and beast. The bite produces the wound, and the saliva is introduced into it at the same time, and whatever germ it is, the saliva is heavily charged with it, or with the poison. This has been proven by the fact that a person bitten through the clothing never suffers from Hydrophobia, as the saliva is wiped off the teeth, while it is common where bitten on the bare flesh. Scientists all say it is in the saliva. We may say that the bite of all animals is poisonous, because the mouth at all times is filled with hundreds of different germs; this is especially true of carnivorous animals, for they eat dead bodies that are filled with germs. We have noticed that dogs that are kept chained often get symptoms of Rabies and have to be destroyed, but I do not remember a case where Hydrophobia occurred from the bite of a chained dog. It is wrong to keep dogs tied up; I think it makes them cross. I never fear a loose dog, no matter how big or cross he may appear, but I fairly dread going near a dog that has been chained up till he is savage, for fear he will get loose some way. It has been a common opinion that during the months of June, July, and August is the time when Rabies is most common, because of the scarcity of water; that is why they are muzzled during dog days. That is another shame; it has been found that kicks and blows, hunger, thirst, or heat etc., do not cause Rabies.

To upset the old theory of dog days, Rabies is most prevalent in the Spring, next in Winter, next in the Summer, and least in the Fall. The bite of any rabid person or animal will produce it; and when once the disease has developed it is always fatal, either in man or beast. It is estimated that only 1 in 5 bitten by a rabid animal gets Rabies; probably because they are bitten through the clothing. The period of incubation is very indefinite; it may be as short as 3 days in the human, and from that any time thereafter; some medical men say from 9 months, or even as long as 10 years—there is no limit known. I found in most cases where a horse was bitten that it ran about 33 days, and the shortest time ever known in a dog was 7 days. About a general average of the time in the dog—the shortest, 7 days, longest, 155 days; man—shortest, 3 days, longest, 9 months; horse—shortest, 15 days, longest, 3 months; sheep—shortest, 14 days, longest, 3 months; pig—shortest, 8 days, longest, 9 months;—with a general average for all of from 30 to 35 days.

Semeiology. — In the dog, about the first thing you will notice is a peculiar, timid, frightened condition; will growl, run and hide in the dark, and it is difficult to get him out; he comes out and crouches down near you as if in fear of something, sometimes will jump up and run away yelping. It is thought they never sleep, are restless, and look as if going into a fit; anxious expression of the countenance; at night when alone they will howl, not the kind of a howl that is common to dogs that howl at the moon, etc., but a hoarse, lonesome, unnatural tone. About the second day he will be inclined to howl this way in the daytime, even when with his master, starts off howling, gets more nervous, and excessively thirsty; he will lay two thirds of his time in the water, tries to drink, but now his tongue will not curl so he can throw the water back into the mouth. In the latter part of the second stage he can't pick up anything but solids—can't swallow. On the third day there is complete

Paralysis of the organs of deglutition; mouth always partly open, tongue lolling out; sometimes during this time a large amount of saliva drips from the mouth in ropy strings; occasionally a little froth at the corners of the mouth but not much; there is much more in an Epileptic fit, which is often mistaken for Rabies, but is harmless. Up to this time the animal has had a depraved appetite, is nervous and delirious, will eat anything—licks stones, etc. After the third day he can't eat, so will keep up a constant gnawing at anything; and the more delirious he becomes the more he will gnaw—often makes the mouth sore, and bites pieces out of it; if he can't get anything else he will even gnaw his own feet. He gets weaker and weaker, and now in the fourth stage is nearly insensible, but wants to be in motion all the time, lays down, gets up, and walks till tired out—that is why they say a mad dog rambles over the country; some say he goes in a straight line and won't turn aside, but will bite whatever comes in the way, and will sometimes chase animals. On the fourth day nervous Paroxysms occur, but not Epileptic fits; they come on oftener, and usually the animal dies on the fifth day. During the latter part of the fourth day the throat becomes much congested and dark in color. A rabid dog never vomits. Then there is a sort of Rabies called the Dumb Rabies, in which the throat is paralyzed; this takes place during the early part of the disease; they can't howl. Death in some of these cases may not take place till the eighth day, though I never saw one run over five days. The idea that a rabid dog foams at the mouth is erroneous. In the horse there are some peculiarities, the first thing you notice (say he was bitten) is that the wound seems to get itchy; he will bite at it, or try to rub against something, and acts as if there was something there he was trying to bite off; it gets so bad that on the third day he will even bite the flesh off the leg. I have seen a case where the horse was insensible, but at times would start up and bite at the wound. Otherwise the symptoms are the same as in the dog. The horse is never still, but on the move all the time; if a person or another animal goes near he will look surprised, then make a dive at them, mouth open. He will also slobber in the water, finally goes down, becomes comatose, and dies in Convulsions, usually the night of the fourth, or on the fifth day. In other animals the symptoms are about the same as in the dog.

Treatment.—It is well to give the owner and the public the benefit of any doubt you have, and then have the animal confined; best to put the dog in a box stall or large box, and see that the horse has a neck-strap strong enough to hang him by. Curative treatment is entirely useless after the development of the disease, but in case of a bite, if you get hold of the case early, (say within an hour, for if there is free bleeding the germ can't be absorbed as the flow of blood outward prevents that), make a free application of some liquid antiseptic deeply into the wound; but if longer than an hour, remember the absorbents are at work and the poison is in the uninjured vessels, so the best thing is to cut a piece of the flesh right out around the part, making a new wound, and then soaking freely with liquid antiseptic, and soaking absorbent cotton and applying deeply so it will go to every part of the wound. Don't use caustics as cauterization used to be practiced; that is now condemned as it doesn't affect deeply enough, and forms an eschar under which the poison can

work without any outside interference. Any good antiseptic will do.

Dr. Lagorio, who has the Pasteur Treatment in Chicago, uses creoline; he keeps the wound soaking in it, using antiseptic cotton. The next thing is the Pasteur preventative treatment. This is on the theory of inoculation, but in so mild a form as to produce a specific fever in a very mild form; this insures the animal or person immunity from the disease. He takes the brain of a rabid dog, makes an emulsion and then inoculates a rabbit; then from that rabbit he inoculates a second one, from that one another rabbit, and so on down to the fiftieth rabbit, when it is said the effect does not differ after that. When a person is bitten he is inoculated over the abdominal cavity twice a day for three or four days, with the weakest virus, and after that for three or four days with a stronger virus, then once a day with a still stronger virus for four or five days, and so on for about two weeks. But if the disease has developed nothing will save the person. We are believers in the Pasteur Treatment. As a rule, dogs with Rabies do not vomit. In some cases of Indigestion dogs get cross and snappish, but there is no fever, as is always present in Rabies; there is no Paralysis of the throat, as in Rabies. If a person is bitten by a dog, do not kill the animal, that is wrong; confine him, and if he has Rabies he will die in a few days; if not, then you can judge if the animal was affected with the disease or something else, and you will know what to tell the physician in order that he may know how to treat the wound—as a simple wound, or as a preventative against the disease. In 1892 Fizzoni and Schwartz discovered that antitoxin, that is from the blood serum of an immuned animal (rabbit), gotten so by the Pasteur inoculation, was a preventative to the disease, either in a test tube or in the body of inoculated animals. The emulsion must be made from nerve substances—the brain or the base of it.

GLANDERS AND FARCY.—These undoubtedly had their origin in the equine race, and from that it is communicable to man, sheep, goat, dog and cat; but cattle, pigs and poultry, have an immunity from it. It is always fatal in all animals, and in man as well. In the human it almost invariably runs the acute course and terminates fatally in from ten to twenty-two days, with a usual average of thirteen days. In the horse it runs both the acute and the chronic. It seems in many cases to arise spontaneously, that is we can't place the origin of it. There are two forms of these diseases, or two manifestations of the same blood poisoning—the virus is the same, only there is a difference in the local manifestations. Glanders affects the Schneiderian and mucous membranes of the throat, larynx, and trachea; while Farcy attacks the lymphatic glands and ducts, and in different parts of the body. They both run either an acute or chronic form; acute usually terminates fatally in from four to six weeks. Acute Farcy runs into Glanders in the course of a few weeks, usually the acute form. Chronic Glanders may exist for years and the animal apparently be healthy and feeding good, and in good flesh, vigorous, and able for work. It depends upon the climate how long it may run without manifesting itself; in this climate it is about three or four years, then the horse begins to yield; it takes on a more active form, becomes acute, and the animal soon dies; but in high altitudes it runs longer, as in some of the more northern parts; it may run five or six years, but even up there they will usually show it in five years or less.

This disease is of antiquated origin; the earliest writers have referred to it inadvertently—it was spoken of in Aristotle's works. In 1618 a Frenchman wrote a long article on it, but in 1840 another Frenchman described it more fully as lesions of the mucous membrane, and prescribed injections for treatment. Since then it has received a great deal of attention. It seems to be a disease of the Temperate zone, as it is almost unknown in either the Torrid or Frigid zones.

Etiology.—Old authors believed it often arose spontaneously, and old army men will tell you the same thing—that it occurred during the Civil War, especially in Tennessee and Louisiana. It seems to break out spontaneously on shipboard sometimes, especially during storms, and in the acute form; but as it is due to a specific germ, it can't be spontaneous, and the case that arose under these circumstances must have been lying latent, and the circumstances were favorable for the disease to make itself manifest—as crowding, which will cause disease to break out among animals; if any disease is lying dormant this will cause it to show itself. The poison of Glanders seems to be in the discharge from the nose or other purulent discharges from the body; but as the virus is of heavy specific gravity it doesn't float in the air; we believe it requires actual inoculation, and this is very fortunate in view of the fact that it is invariably fatal. The active principle of the Contagium was discovered by Löffler and Schultz of the German Board of Health in 1882. The germ is a Bacillus, and they say it resembles the Bacilli of Tuberculosis, except that methyl blue will color it. Some say it exists in the system in very limited numbers, that making it very hard to find; and also that there is a Micrococcus in it very plentiful, but that it is inoculate, that is the poison is all in the Bacillus. Before the discovery of the germ the disease was classed as a granuloma disease.

Semeiology.—Very often the acute form of Glanders and Farcy is preceded by Diabetes Insipidus. In all probability if the temperature were taken every day from the start, it would be found that its rise was first from 103 to 104 or $4\frac{1}{2}$, then comes on the Diabetes Insipidus, which is quite prominent for three or four days. The next symptom is the limpid reddish discharge from the nose, and this is so thin that it drops from the nose like water, sometimes from one, sometimes from both nostrils. If you feel of this discharge it feels sticky, not so much in the first stage, but it seems to grow more so in two or three days—more glutinous. It sticks around the nostrils, and dirt and sticks adhere to it, making a dirty looking sight. In from two or four days the discharge becomes lighter in color—amber-colored, or much like melted butter. While this is going on the submaxillary glands (lymphatics) swell: this is almost invariable, and while swelling, are sore to the touch, and as a rule do not suppurate. Some Vets. say if there is suppuration it is not Glanders, but there is no reason why. You can't go very much either way on this. In Farcy the rest of the lymphatics of the body do suppurate, so there is no reason why the submaxillary should not also. During this time in some cases there is more or less Osteoporosis going on, sometimes to such an extent that you may suppose the horse is developing Big Head; so you must be careful in your diagnosis.

You may find a peculiar rheumatic lameness in the earlier stage of acute Glanders—in the hind quarters, or loins and other places; many of

these things exist in the first stage of Glanders. The pulse becomes accelerated, may be fifty-five, the temperature also increased—103 or 104. If the case is brought to you in this condition you can't tell just how it is; you may suspect Glanders, so it is best to watch it closely till it manifests itself. The discharge from the nose grows thicker and has more mucous with it, and becomes a muco-purulent discharge, so you can't mistake very well in the color, because it comes from inflammation and ulceration, and if it could now be separated, the early discharge would be butter-colored; as a rule the discharge is a whitish-yellow; it differs from a catarrhal discharge in that respect. It is often quite profuse; often it is quite or nearly colorless, but glutinous. The animal frequently sneezes or blows his nose, so that the stall will be smeared with this discharge, and filthy all around him; he does this because the pus is irritating. He is inclined to rub his nose against anything, and shakes his head often; it is often due to this rubbing against posts and watering troughs that other horses get the disease. I never tie my horse to a wagon wheel or to a post for this reason, but always carry a weight, also keep head checked up. As the disease progresses the pustules in the Schneiderian membrane rupture and the discharge is purulent and sometimes streaked with blood. The pustules have raised, indurated edges and are depressed in the centers—resembling the soft Chancre in the human. As these ulcers rupture, blood vessels are also ruptured, so the blood that is seen in the discharge is almost constantly present in the last stage of the disease. While this is going on emaciation is taking place rapidly; often a cough accompanies the disease; the appetite usually remains good; as it runs on to a fatal termination the animal pines to skin and bones; legs swell, he staggers, nose is a mass of eruptions, and the discharge becomes very offensive—stinks; then till death he is a stinking, loathsome object; finally goes down, lies two or three days and dies of collapse. From beginning of Glanders up to necrosis of bones, discharge is odorless; but after necrosis of turbinated bones has taken place, it is very offensive.

In acute Farcy little Abscesses occur on different parts of the body; as a rule they come up about the size of the end of your thumb, and horsemen call them Farcy Buttons. They are swollen, suppurating lymphatic glands, often break out on the sides of the hip about the size of the hand; these often break and a cavity as large as a hen's egg is left, but as a rule Buttons that break and discharge dry up and heal, then others break out. These Farcy Buttons are more often seen on the inside of the thigh or arm, but not always; I have seen them attack the head and neck, so they may confine themselves to one quarter of the body. Pulse and other acute symptoms are about the same as in Glanders, but there is no discharge from the nose. In acute case of Farcy, Glanders may develop in from two to six weeks, so the horse never dies from acute Farcy without running into Glanders, when he dies the usual way. A particular symptom in Glanders is, that as the disease develops the inflammation causes swelling of the mucous membrane, and the calibre of the passages is so diminished that it produces a sort of a snoring sound, and more or less labored breathing. This helps much in diagnosis.

Chronic form of Glanders often has a continuous but slight discharge from the nose,—nose is always dirty; animal keeps in good health, but there will invariably be a peculiar enlargement of the submaxillary lym-

phatics; it is lumpy, while that in the acute is smooth; the nodules are hard, but not sore; in the acute they are sore to the touch. In most cases after chronic Glanders, sub-acute Farcy will usually develop; it may be that one hind leg will swell, etc., often producing chronic Big Leg, and this can be diagnosed from Big Legs from other causes by having scars, for when the ulcers heal they leave cicatrices. Hair never grows in these cicatrices. Mild cases of chronic Farcy from exposure to storms, starvation, etc., may break out in acute Glanders in time, and may run on for years, carrying the disease wherever they go. I think either form of this disease may occur for a long time, but before death they both must be present. Farcy never terminates without Glanders. The period of incubation is indefinite. It is supposed it may be as short as twenty-four hours, or may be indefinitely delayed, even for years; but the usual average is about a month. The vitality of the germ is very great, probably no other specific germ has such vitality; it will remain alive if dry, for years, but freezing will kill it if it be in the wet. The meat of a glandered animal is very poisonous; will produce the disease in dogs, lions, etc., that may eat it.

Treatment.—Therapeutical treatment is no good, but there are always doubtful cases; may give general tonics to such, till you are certain of the disease. Glandered animals are always destroyed; there is no use in trying to save blankets, harness, etc.; burn all and thoroughly clean the stable, tearing out the stall he used; burn sulphur in the stable, then whitewash. Quarantine exposed animals for ninety days. Illinois law pays one-third of the value of a sound horse for every glandered animal destroyed; where an exposed one is killed, two-thirds of the value is paid. Through Dr. Baker's efforts the law permits a quarantined animal to be worked in a safe way, with the understanding that the horse must be examined once a week at the expense of the owner. Punishment for breaking the law is fine or jail, or both. When examining a horse for Glanders never approach him from the front, but either from the rear or from the side; be careful not to allow him to sneeze in your face. There are a number of cases on record of persons dying from this disease, even nurses that had their patients sneeze in their faces. Hold the horse firmly by the halter while examining, and after examining wash your hands well with soap and water with a little antiseptic in it. To decide a doubtful case, get Mallein from the experiment station in your state; it is a culture made from the *Bacilli Mallei*, and an albuminose made. Inject one cubic centimetre, about fifteen drops, under the skin of broadside of neck; take temperature two or three times for two or three days before injecting, then three or four times after for forty-eight hours—say every four hours. Make injection at night; take temperature next morning. If they have Glanders the temperature will run up to 104, 105, 106, and often never returns to normal again, but causes the disease to develop. In other cases it may lessen in a few days; there will be suppurating and swelling at the point of inoculation, if the horse has the disease. If no Glanders, this will not be the case, but the temperature may run up one or two. The Tumor will be from three to five inches in diameter, with suppurating in the center.

Post Mortem.—We find ulcers in the throat, larynx, trachea, bronchial tubes, sometimes pharynx, and in the chest; interstitial Pneu-

monia in many cases; lymphatics in other parts of the body will be enlarged. Mules and asses seem to have the disease more acute than horses.

STRANGLES, Familiarly known as **HORSE DISTEMPER**.—This is a pyogenic, infectious fever peculiar to the horse; there is nothing like it in other animals. It is attended by the formation of Abscesses in every case. It is usually seen in the form of a colt disease, especially in the country, but in the city we see it in all ages. Colts mostly get it when two or three years old, and one attack of this disease renders immunity from another attack, as a rule, but there are exceptions to this. It is considered actively infectious. If introduced into a herd of horses it will run through it. If in a stable in the city, it will soon attack a dozen or more of them; say two or a dozen out of fifty. It runs a definite course every time; first, fever; second, formation of the Abscess and pus; third, rupture and discharge, and if they don't die in the fourth, they recover. Some say that it is not a specific or infectious disease; because it does not always produce the disease by inoculation, but in every other respect it is specific, and a few failures do not prove that it is not specific. The period of incubation is from one to two weeks.

Etiology.—We believe it is a specific disease, but that the germ has not yet been found. We find that during the cold storms of Fall and Spring, colts are most apt to have it.

Semeiology.—It may occur at any time of the year; it begins with a high fever, pulse rapid and soft, gets weaker in the course of two or three days; mouth is hot and dry in the first stage; in the second it is full of ropy saliva; a very sore throat develops, filling up on the inside as well as swelling on the outside, which makes it very difficult to swallow. There is a troublesome, painful cough and considerable Dyspnoea, sometimes so bad as to require the insertion of a tracheotomy tube; this is particularly so when having fits of coughing, after the fit is over. The Abscesses usually form in the submaxillary space, may be in the throat, or the guttural pouch, or may affect the lymphatic glands. Usually one or two Abscesses form, or there may be a dozen small ones; these are usually from an inch to an inch and a half apart; usually the pus is all in one, or in two large ones—may be one half pint in one. It takes a week for this to form, and it will discharge in a week or ten days. Colts recover in about two weeks, but in bad cases may be five or six weeks; during this time there is fever, and it is difficult for them to eat, so they become emaciated, and often die from exhaustion and collapse. Where it takes so long, the pus begins to be absorbed, causing pyæmia, and they die from exhaustion and collapse. Irregular form of strangles, or as horsemen call it, Bastard Strangles, has the same fever but longer; Abscesses form, but not in the same places; they are often seen in the pleural cavity, seemingly in some of the lymphatic glands, other times in the walls of the pericardial, and may rupture into it. They may develop anywhere—in the liver or in the brain, etc., but are more often seen in the peritoneal, pericardial, and pleural cavities. They may not form on the inside, but may on the outside—on the vagina, or any place on the outside of the body. When they develop on the inside it is almost invariably fatal; when on the outside, sometimes fatal, sometimes they recover; it depends on how large they are and how long in breaking.

Treatment.—Must run its course, can't stop the fever till after the formation of pus; the fever then may be 104-5, or 6—may reduce it to 103. It will frequently jump from 103½ to 105, and will then fall the same way, but you can't stop it entirely till pus has stopped forming, so all we can do is to hurry up the process and assist nature to get rid of the pus or poison. Try to reduce the fever, and give good hygienic treatment—soft food and a little febrifuge; to assist formation of Abscess, apply hot poultice, which also lessens pain. Usually apply first, mild counter-irritant, as ammoniacal liniment—one application will usually do, then poultice; we prefer linseed meal. As soon as you can locate the developed Abscess so as to be positive of its location, tap it, don't wait for it to soften. We find it safe to go in and hunt for pus—say, after four or five days, never let it go more than a week; make a liberal opening, syringe it out with antiseptic and add antiseptic to the poultice; poultice till the inflammation subsides. If it is impracticable to poultice, bathe with warm water. If the cough is troublesome, camphor electuary will relieve; give in addition to the febrifuge. Often the fever will remain high five or six days; watch closely and carry your tracheotomy tube in your pocket ready for use, don't let him go down before using it. Steaming will relieve; medicate the water with carbolic acid; it is a local anodyne as well as antiseptic. Sometimes the Abscesses break into the guttural pouch; may last for weeks, then get anthrifty, though no swelling is seen on the outside. Lay your horse down, use the mouth speculum, and insert your arm and try to locate the Abscess. In death you will find the Abscesses somewhere in the body. Good plan is to take affected animal from among the others, and fumigate and whitewash the stable inside. During convalescence give tonics, as tinct. iron, as soon as you tap the Abscess, or may even give it before; don't matter if you use it all through, but it would do harm in a sporadic case. Never deplete, but purify the blood. Give iron where there is Dyspnœa and Strangles not bad; but if Strangles and tumefaction are bad, iron would make matters worse, as it contracts the parts, so give camphor electuary in that case.

ANTHRAX.—Is a peculiar virulent, infectious disease. It is known by different names, according to its manifestations and the country it is in. The French call it Charbon Anthrax; this is the generic term, and covers the list of malignant diseases under this form. Charbon applies more directly to where it is located. In the tongue is called Glosso-Anthrax; in Scotland, Blaine. When in the fore or hind legs, it is called Black Leg. In the spleen it is called Splenic Apoplexy; also called Braxy in sheep; in human often called CHARBON. It starts in pimples sometimes, then pustules—sometimes called MALIGNANT PUSTULE, sometimes CONTAGIOUS CARBUNCLE. There are various conditions and degrees of severity in this disease, and they are all of the same nature.

ANTHRACOID.—Is a very mild form of Anthrax; all warm-blooded animals are subject to it. Prof. Williams says it is peculiar to herbivorous animals and birds; Dr. Baker agrees with Pasteur that fowls are not often attacked because of their high normal temperature, but we find that if fowls eat Anthrax meat they get Anthrax, but not so surely as animals. It requires inoculation for it to develop, but it matters not how that is done, or how taken into the body—either in a wound, or with the

food into the alimentary canal. It may appear any time at any season of the year, under any circumstances, but we find it is most prevalent in August and September; no animal is exempt. It caused an epidemic during the Siege of Troy among horses, cattle and people, from eating Anthrax meat, and in 1617 in Naples it caused an epidemic from which 60,000 people died in one year.

Etiology.—The specific cause is the *Bacillus Anthracis*, discovered in 1850 by two Frenchmen (Rayer and Devaine). They say it is a very easy germ to find; the rod is long, about three micromillimetres, and from 1 to 1 and $\frac{1}{8}$ in width; the end of the rod is square or slightly concave. Vollinger said decomposition of the tissues kills the germ; Prof. Koch denies that, and I think he is right. The number of germs in the blood increases wonderfully as death approaches, and they continue to develop after death while the carcass is warm. In the first stage there are only a few germs in the blood, but in a few hours after death the blood is loaded with them. Koch says the alimentary canal is the natural channel for its introduction; Pasteur says inoculation with mild virus will give immunity from severe inoculation; Koch says it will not give immunity from its introduction into the alimentary canal. We think Pasteur is right and Koch wrong. It may be introduced through microscopic wounds, but the alimentary canal is the most common. It may be introduced through any abrasion that will bring the juice to the surface, or from the bite of a house fly poisoned by feeding on an Anthrax carcass; and the same way by stings of bees and other insects. The germ will freeze and thaw and still live; it is the strongest germ known. Period of incubation is variable, depends first on number of Bacilli taken in; second, on the vitality of the Bacilli; third, on the condition of the blood of the host. We find that intravenous inoculation produces well-marked symptoms in from four to six hours after eating Anthrax meat, but from bites, may be from twelve to eighteen hours. Sheep fed on grass with this germ may not develop symptoms for three or four days. In horse, from inoculation, from four to eighteen hours; alimentary canal from two to four days; Pasteur says a mild attack will render immunity from a severe attack ever after. Sometimes animals recover from Anthrax, but if they do the recovery is slow, and the animal is often wobbly in gait afterwards. One most prolific cause is throwing an Anthrax carcass on bottom lands, and the high water floats the germ down and leaves it on meadow lands or lowlands, where it gets on the grass. You must be careful in autopsy not to get the germs into a wound; a good idea is to use rubber gloves, and rub carbolyzed oil over all exposed parts to keep flies from biting you after being on the carcass.

Immunity from Black Leg and Brachia is obtained by inoculation. Pasteur performed it very extensively in France among the sheep. He cultivated the germ in chicken broth. The strength of the culture lessens with age; he kept this broth at a temperature of forty-two to forty-three degrees centigrade, equal to 107 and 3.5 to 109 and 2.5 Fahr. This high temperature lessens the vitality of the germ. At this temperature, he says it will die in a month, so the culture is then inoculated, hence the germ must be gradually dying during this time. He inoculates sheep first, with this culture that is twenty-four days old, then in twelve days repeats with a virus twelve days old; this in most cases will produce

a very mild fever that lasts a day or two; sometimes it is severe and may produce death; but is usually very mild, and the fever renders immunity ever afterwards. Koch said Pasteur's inoculation hypodermically, was not proof against the germ taken into the stomach; that is absurd and has been proven so. The disease is often produced by eating hay from bottom lands, because the germ was on the grass,—thus it is often a mystery where the disease originated. Death often occurs during the night with no sign of a struggle. Autopsy will show Splenic Apoplexy. It seems that Anthrax taken the usual way, more often attacks the strong, healthy animals and the fattest, probably because they are the best feeders and eat more of the germs than the delicate ones.

BLACK LEG.—Used to be considered as a result of changing from poor to very nutritious pasture—turned into meadows. Why they get it, is a question. Sudden change used to be thought a cause; changing from cold to very warm, crowded stables is apt to bring it on in the form of Splenic Apoplexy. In Black Leg the conditions seem to be exactly the same, that is of the same nature as in Splenic Apoplexy. In Splenic Apoplexy the animal dies from gangrene of the spleen; in Black Leg from gangrene of the quarter.

Semeiology.—In horses and cattle there are two forms that are recognized; first, Anthrax with no visible outward enlargement, and animal dies from internal morbid anatomy. The second is that with swelling, spoken of as Tumor when the animal dies from external morbid anatomy. When he dies from the first, there is no symptom of the disease except fever. In the second, this swelling begins first, or the lameness may begin first. Cases of this trouble in the quarter seem to lie in the blood being so thick it can't circulate through the part, through the capillaries; hence there is capillary congestion; this produces a sloughing of the quarter, and then lameness; as it swells there will be exudation into the surrounding tissues. If from any cause the circulation is renewed in the part, the animal may recover; otherwise he will die. It is said that cowboys recognize this fact, and if they notice an animal down and suspect the cause, they force it to rise and run, with the idea that exertion may start anew the circulation. In Black Leg the tongue will be swollen a little; the swelling may not start in the leg, but in a single set of muscles and then spread; but it usually affects the whole quarter. There is high fever, he becomes listless, the parts will get tender, the pulse will be feeble and rapid. The fever starts in soon after inoculation, and as the quarter swells it gets cold and insensible, and in from two to twelve hours after the swelling, the skin will crepitate on pressure. This is due to the sulphuretted hydrogen gas formed, which is positive evidence of gangrene; death soon follows. Horses are seldom ever attacked with Black Leg; it takes the form of Splenic Apoplexy, and the animal does not die so fast—in from four to seven days, or several weeks. One of the first symptoms is, they isolate themselves from the rest of the herd; temperature may be 105, 6, or 7; there is loss of appetite in most cases. It is said that 9 out of 10 will recover if they retain their appetite, while it is the reverse with those that lose it; this may be from the fact that with good appetites they keep up their strength, hence their chances are better. In the horse the temperature may drop down to 104 in a few days. About the second day the visible mucous membranes

show cachexia, that runs into patches of Ecchymosis, say about the third or fourth day. Animal staggers about, finally goes down, lies from 4 to 24 hours and then dies. There is no symptom in some cases except the fever; in others there is swelling also.

Post-Mortem.—The cachexia and Ecchymosis on the visible mucous membranes, while not diagnostic are invariably present; some say more extensive in this disease than in others. In the human there may be such a thing as Typhus Fever, but 99 times out of 100 it is Anthrax. On opening these cases the first thing you will notice as you cut the blood vessel, is that the blood is not coagulated, but is black and thick, will scarcely run, and resembles tar; this is nearly diagnostic, and is invariably the condition of the blood. As you open the abdominal cavity you will find cachexia spots covering the serous membrane, sometimes very large. The spleen will be tremendously enlarged, and full of black blood; the congestion seems to have broken down the trabeculæ, and the blood will gravitate from end to end by turning up or down. The adipose tissue around the kidneys and other places is congested, and blood infiltrates into it, so that it looks reddish. That is about all you will find—the condition of the blood is the main feature. In Black Leg, when the crepitating sound is heard, you will know that gangrene has taken place and the quarter is dead long before the animal dies. If the animal is down and you force him to get up he will be very lame and will soon lie down again, and in five or six hours will be dead. Usually with these cases there is congestion, and the urine is scant and high colored. Animal usually dies in a comatose condition.

BRAXY IN SHEEP.—Has two forms—Splenic Apoplexy, and the one with the swelling on the outside, same as in cattle. You will find extravasated blood in the intestinal canal. In young lambs there is what shepherds call **NAVEL ILL** in the form of a Tumor around the umbilicus. Williams calls this Charbon.

Dogs seem to have some immunity from this disease; they may eat the meat of Anthrax carcass and not get the disease, but the germs will be in their mouth, and a bite from them will inoculate.

In the Pig it is the same as in other animals, they can get it from eating Anthrax carcass.

ANTHRAX IN POULTRY.—As the disease develops in them they get listless, have fetid Diarrhœa, wings drop, combs and bills get black, Tumors form between the digits, especially in geese and ducks; they wont perch to roost, but will stay on the ground.

ANTHRAX IN THE HUMAN.—From bite of a fly from off carcass, there is first, a red pimple which in a few hours will enlarge and turn black and spread; pustules form in the center, and soon you have a genuine case of Anthrax; death sometimes occurs in 6 hours, or may be prolonged 24 to 48 hours, or some days.

Treatment.—For the human, soon as you see the pimple the only treatment is to excise; take out a good big chunk and be quick about it, then stop the hemorrhage and treat with antiseptic—creoline and campho phenique are probably the best. As a rule, treatment is useless when Anthrax sets in, though it is possible something could be done to counteract the poison; might try hyposulphate soda or carbolic acid. Tinct. iron and alcoholic stimulants are strongly indicated. In convalescence

give iron and vegetable bitters. If you can anticipate Black Leg, give exercise, as it may cause the circulation to improve. Ammoniacal stimulants are not indicated.

Preventative Treatment.—Is important; try to find the cause and remove. Always burn a carcass from this disease, there is no other way to dispose of it, but if you must bury, then cover it with lime. For Black Leg and Braxy, if epidemic, you should try inoculation.

HOG CHOLERA.—Given the name of Swine Plague by Prof. Detmers of Columbus, Ohio, who was one of the first to do anything in the way of investigating as to the pathology of the disease. He found the disease to be due to a Micrococcus. Hog Cholera is supposed to be a disease of the bowels, but it is not always so, and for that reason Detmers objected to the name and called it Swine Plague. But Cholera applies in many cases very well, because in autopsy there is ulceration of the bowels; this we always have in choleric conditions, that is we must have choleric conditions to have ulceration of the bowels. Often we find lung, spinal cord and other complications present; lungs being affected with Bronchial or Pneumonic Catarrh. In other cases we get Spinitis with Paralysis, and in most cases more or less skin complications. There is a Specific Fever that runs a tolerable definite course. In some seasons the mortality may run as high as 90 per cent, other seasons be down as low as 40 per cent; so there is a difference in the seasons, without any apparent reason. This disease is no respecter of age, sex, conditions, etc. Hogs that wallow in mud, filth, and their own dirt are no more liable to it than those under different circumstances. The germ will grow in any soil. The lymphatic glands in many cases are much affected.

Etiology.—The specific germ is a belted Micrococcus. It seems to have its habitat in the ground, or in the fœcal matter of hogs. A particularly good soil for them is where bedding is mixed with the excrement of the hogs. Detmers says the most virulent form is among hogs around hay stacks.

Semeiology.—It begins with a rigor, followed by coughing and sneezing, and other evidences of a catarrhal condition; elevation of temperature, languor, loss of appetite, staring coat, drooping ears, and alteration of the secretions. Hogs will try to hide in the bedding. In the course of two or three days eruptions will come on the skin, generally on the ears first, a kind of red pimple; this is inclined to spread; there is often considerable breaking out in the way of œdemic conditions; sometimes the skin doesn't break, but takes on a purplish color. Sometimes the brain seems affected, and they stagger. As the lungs are affected there will be evidences of labored breathing; usually, rapid emaciation, sometimes Constipation, but mostly Diarrhœa; sometimes they have a capricious appetite; usually an accumulation of muco-purulent matter in the corners of the eyes, and a copious discharge from the nose; peculiarly offensive fæces. When there is costiveness the excrement is usually gray, or may be black and hard; they may also have Diarrhœa, as there is inflammation of the mucous lining of the bowels; sometimes there is blood with the fæces; wounds ulcerate, ulcers are seen on the lips and tongue sometimes; jaw-bones often necrose; sometimes they die in convulsions, other times they will pine and die. In mild cases none of the symptoms are aggravated and they often recover; in some cases,

after recovery, it leaves them with a chronic cough for a long time; again, it may leave them worthless; they wont fatten.

Post-Mortem.—You will find more or less hepatization of the lungs, and often great numbers of Bacilli that are supposed to cause Pneumonia; but it is in the blood serum that the specific germ is found. In the abdominal cavity will be found cachexia spots on the serous membrane and the mesenteric glands, and the lymphatics are very much swollen, sometimes strawberry-colored. Billings thinks this color diagnostic, but it is not invariably present; there is ulceration of the ileo-cecal valve, and more or less ulceration in the cecum and colon; this ulceration is diagnostic of the disease. Period of incubation is from 5 to 15 days—average, 7 days.

Treatment.—Therapeutical treatment is useless; give prophylactic, treatment to save the remainder. Quarantine the farm, prevent them from being shipped, then take the well ones from among the sick and put them in a different place; don't take out the sick ones and leave the well ones in the place. Give good hygienic treatment; burn the carcasses, bedding, etc. It is said the Contagium lasts an indefinite time. If there are wounds on the body, dress antiseptically. Prof. Detmers recommended 10 drops carbolic acid to every 100 pounds weight of the hog, given in the drinking water; repeat two or three times a day, until animal is convalescent. The Government Inspectors condemn hogs with this disease at the stock-yards. Though not communicable to man it is, on general principles, diseased meat.

CORN-STALK DISEASE.—This is a peculiar disease of the West; there has been a little of it in Illinois, Iowa, Kansas, and Nebraska. It seems to be a disease of the corn due to some fungus, and horses and cattle eating the stalk get the disease. The origin of this disease was discovered by Dr. Billings in Nebraska, with the assistance of Dr. Burrows of Champaign, Ill. It is so well known now that you can pick out the diseased patches in the corn-field; it doesn't spread all over the field. It interferes with the growth of the corn, and breaks out usually at the junction of the leaf and the stalk; there may be little cachexial spots up the whole stalk. They turn brown, spread out on the leaf and down the stalk. It is due to a vegetable parasite. When animals are affected, in the course of a few days the brain becomes affected, they get delirious, become pugnacious, and want to fight everything—even imaginary objects, like a man in the Delirium Tremens. If anything comes in sight they go at it with open mouth, so they are very dangerous to handle. The temperature increases very much; the trouble keeps on increasing till they lose the power of co-ordination, stagger and go down, and die in convulsions. The symptoms, with the history, will help you to diagnose. It usually occurs in the Fall and Winter; never in the Spring or Summer.

Treatment.—If the disease has developed, treatment is useless. Prophylactic treatment is to turn the animals out into the field. Many persons pick out the diseased corn and destroy it; some farmers now cut corn when the corn is full in the milk; in this way there is a saving of 40 per cent in the quality of the fodder. Always burn diseased corn, for the parasites go into the ground and when the young corn comes up they attack it. It is the worst about the middle of June.

ACTINOMYCOSIS.—This is a peculiar disease which seems to develop mostly in cattle, some in the horse, and is comparatively common in the human. It produces local lesions wherever it happens to develop. The peculiarity is in Tumors that resemble Cullloid Tumors very much; they have honeycombed cells distributed through them, filled with a gelatinous pus, in some cases so thick it will not run, in others it will run, but is very thick. There is nothing cancerous in them, as in the Cullloid; they are due to a ravenous germ, which is a star-shaped fungus known as Actinomyces. This germ is large, and when full grown looks like a sponge with club-shaped prolongations; it resembles a cactus plant, and when mature is too large to float through the capillaries. The clubs are full of spores, and these all break apart and each one forms a new germ; these are small enough to pass through the capillaries and find their way to all parts of the body, even in the bones of the vertebræ; the large ones seem to stay in the place they locate in, and don't get in out of the way places. The most common place for them is in the jaw-bones, tongue, lymphatic glands, and in the submaxillary space. They are also found in the small intestines, liver, pancreas, spleen and lungs, and have been found attached to the walls of the heart. In the lungs they produce a soft caseation easily broken down, which usually becomes liquid, with hard particles in it; these hard particles are gray hepatization, in which the germ is found.

When the large vegetable, star-shaped fungus breaks up, or the spores detach, they are then not more than $\frac{1}{4}$ the size of a red blood corpuscle. In the liver, bowels, etc., the disease appears as little Tumors. The pus that escapes from these Tumors is a grayish-lavender color, with the yellow lumps floating in it; these can easily be distinguished, and may be from the size of a pin head to $\frac{1}{8}$ inch in diameter. To examine the single germ, use acidulated glycerine to clear it, thin it. It doesn't require to be colored, but you may if you choose use bismark brown or methyl blue. If there is a Tumor on the jaw, it works into the jaw-bone, don't know how it does, but it is supposed to be through decayed teeth or from mucous membrane, and causes a rarifying Ostitis, making it honeycombed like, and it continues to grow. This disease is spreading rapidly throughout this country. We believe that the discharge from a suppurating Tumor drops on the grass, and that other animals eat this grass and get the disease. It has been proven that the disease can be produced in any part of the body by inoculation, so no matter how it is taken in, the germ will produce the disease.

But how people get this disease is still a mystery; it is getting to be more common in the human. The pus of Tumors in the human and that from one in a bovine have been found to be exactly the same. In Germany every slaughter-house has a veterinary inspector, and they mark the meat according to its quality as fit for market—1, 2, 3, or 4, and they class this kind of meat as number 4. It has been found in the human to be the most common in pauper hospitals, but not so much so in this country. Dr. Billings thinks it is harmless to eat this meat, but some of our best doctors think differently; Dr. Billings bases his belief on it not being contagious, because he saw a cow suffering from a severe attack of this disease, among a herd for a long time, and the disease never developed in any of them. Dr. Baker tells of a bull that was

brought from Kentucky into a county in Illinois where the disease had never been; this bull had a small Tumor that broke and discharged 6 weeks after, and in 6 months after 13 of his herd had the disease. There has been a number of such cases, and they go to show against Dr. Billings's idea. These Tumors may be in the jaw or throat in the human, and may cause death in from three months to several years.

Semeiology.—The first thing you will notice will be an enlargement wherever the disease is developing. This keeps on increasing, and sometimes interferes with their feeding, other times does not. It may affect the tongue, causing what is called Wooden Tongue; this is not so common in this country, but in Germany it covered about twenty-five per cent of the cases of this disease. Here we frequently find the soft Tumor in the throat, then in the upper jaw, then in the lower jaw, and about sixty per cent, the greater part, in the mouth, which proves it is taken in with the food, passes through the stomach and is not digested, and so it passes to the bowels, where you will find sixty, seventy, or more Tumors. About five or ten per cent of the disease locates in the liver, and about five per cent in the lungs. In the human it attacks the bones of the spinal column, or any part of the body or bony structure. In cattle, unless it interferes with some vital function, it does not affect the general health of the animal. In the human it is more violent, and usually fatal in from three months to three years. It was found at one time that 300 out of 2000 cattle in the feeding sheds at the Peoria distilleries had the disease; it was not known that they had it before they came there, but it looked much as if it was due to the germs dropping into the meal, and others eating it affected them also.

Treatment.—The old-fashioned treatment was opening and syringing out with antiseptic; that may do for outside Tumors, but even then it is hardly satisfactory, as the antiseptic doesn't always get to the place where the germ is, or there may be Tumors farther in that will not be affected, no matter how strong the antiseptic. Some pack the opening with sulphate of copper, or such like strong caustics, but even that is not satisfactory. The next best thing to do is to dissect the whole body, if no vital organ or part is affected. In Germany for the treatment of Woody Tongue they started the use of iodide of potash, which proved to be pretty good, so now it is used in this country. For a $2\frac{1}{2}$ to 3 year old animal weighing about 1200 to 1300 lbs., give internally 1 to 2 drs., well diluted, three times a day, and remember that the more you dilute it the more good it will do; put the dose in a pint or even a bucketful of water, and continue this till iodism is produced. It usually takes from a week to ten days in cattle to produce iodism; they are far more susceptible to iodide potash than the human. The first symptom of iodism is acute Coryza (a watery flow from the eyes and a watery discharge from the nose), loss of appetite, and in the course of a few days the skin takes on a bran-like scurf. If iodism has set in, stop for eight or ten days, then repeat till the symptoms of iodism show again. We recommend this treatment, and with this it is well to open the Tumors to allow them to discharge pus. In human it is well to dissect.

BOTRYOMYCOSIS.—This invades a wound; in some respects it resembles Actinomycosis. It is a Tumor that develops on account of the invasion of a wound by a drumstick-shaped germ called Botryomyces;

the Tumor may or may not suppurate, but usually there is enough supuration to cause proliferation. An example of this disease is Scirrhus cord, after Castration generally.

Treatment.—Excision.

BURSAUTEE.—Sores on horses due to exposure to rains; this is an East Indian disease, but there is a somewhat similar one in the South of this country; as seen in East India it is a peculiar disease. There is no clear proof of it being contagious, or of its inoculability. It is characterized by certain structural changes in the skin, and sometimes in the external organs in wounds. The changes that take place in the structure are slow, and the Tumors that form in the skin are inclined to return at some other more favorable time. In these sores there is a peculiar kind of thickening, it seems soft and spongy. East Indians call it Kunkur. A characteristic of the disease is a peculiar Tumor with an ulcerating top. The disease is not fatal, but produces extreme weakness and causes the animal to scratch and rub so much and so long that the owner gets tired and kills him. The disease seems to flourish more during the rainy seasons. There is an idea that it is contagious, but this is not positively known. Some think it hereditary, and that it is not considered advisable to breed them.

Etiology.—It is supposed to be associated with filth, bad care, etc.

Semeiology.—Tumors form in the skin or under it; there is considerable itching and general distress accompanying the sore. The animal will bite and rub the sore till it is raw, which then ulcerates, this is liable to spread and ulcerate, till it may be either the size of a hen's egg or about 15 inches in diameter. These Tumors feel and look like sponge; this is characteristic of the disease, but there is no liquid in the Tumor; sometimes they become firmly attached to the healthy structures lying beneath them. It seems that these Tumors are inclined to form where the harness rubs; this often appears to be the cause. The ulcer has the appearance of any ulcer—edges raised, with a depressed center, or it may have a papillated appearance; it discharges a thin puriform matter. The Tumors sometimes become confluent, and occasionally heal spontaneously, but not as a rule; they grow worse, but the horse doesn't seem to suffer much. Different parts of the body may be affected at the same time.

Treatment.—Excision or extirpation of these sores with the knife, and removing all the diseased tissue; treat the wound as a simple wound—antiseptically, etc. Give tonics internally and liberally; iron and arsenic particularly. Keep off the harness until well.

INFLUENZA.—In the horse is almost identical with Influenza in the human; that is the GRIP, which is a form of Influenza. In the horse this is a distinctly catarrhal affection of the air passages, particularly of the head and throat. It is usually Epizootic—may be Enzootic, but the difference between the two names is in the amount of country covered; both being due to the same cause. Influenza usually covers a large tract of country; it used to be thought due to some alteration in the character of the atmosphere; that now is obsolete. It is recognized as being a distinctly specific germ disease, and by the course it runs, particularly in the horse, we are thoroughly satisfied that it is infectious. Country horses brought into sale stables seem to suffer generally from this

disease, because once the disease gets into these stables it remains there, and fresh horses coming in get the germ, which is the specific virus, and does not require inoculation. It often runs a very malignant course, and in many cases proves fatal. The period of incubation, on an average, is about one week, and a horse having it will leave the disease behind him wherever he may go. It does not confine itself to the head and throat, but often runs down to the lungs, producing a fatal Pneumonia or Pleurisy and Hydrothorax. In case of Pleurisy, you will find every part of the pleural surface involved, and the water in Hydrothorax has a foetid odor; sometimes Carditis is associated with it, and we often find hepatization in Pneumonia with it. If it confines itself to the head and throat there may be Abscesses formed, resembling Strangles. Scientists believe the germ floats in the air. In 1872 there was an Epizootic of this disease all over the world; it started on the Pacific coast of this country, reached the Atlantic and crossed over, attacking all the civilized world; this was among horses. It seems that when horses are affected the human is not very much, and vice versa. It has no respect to sex, age, or condition. Death usually occurs from thoracic complications, either Pneumonia, Pleurisy, etc., sometimes in the form of Enteritis, or in the kidneys, as acute Bright's, but with proper early treatment they will recover.

Semeiology.—Great nervous prostration is the first symptom; often the disease is not noticed till the horse is so weak that he staggers; this prostration we believe develops in the early part of the disease. During the period of incubation a high fever develops, temperature may be 106, 107, or even 108, usually 106; we conclude it is not developed suddenly, but is not noticed at first. Breathing is accelerated; will often find this breathing characterized by a snoring sound, like that in a chill, though there is no shaking or shivering in this. Pulse is hard, quick and irritable; the rigors are liable to take place from time to time. There is hanging of the head, drooping of the ears, hot mouth, red eyes, and in the corners a muco-purulent matter; sometimes there is a swelling of the lids. These features of the eye lead some to call it PINK EYE; it is only a form of Influenza. It is usually applied to that form or part of acute Cellulitis around the eye. There is a profuse discharge from the nose, often of a muco-purulent nature. The per cent of deaths depends on the amount of complications with the disease. One feature particularly, is that every part of mucous membrane is affected with a mild catarrhal affection; the effect of this is to increase its secretions; in the bowels this causes more or less Diarrhœa, sometimes well marked; where the bowels are not so affected you will find the fæces covered with a slimy mucous. Any mistake in treatment may cause death—may run into Purpura Hæmorrhagica, which is frequently a termination of the disease. If the animal recovers he is often left with a chronic Catarrh that may render him useless for months, or for a year or more, or may make him absolutely useless.

Treatment.—Good hygienic treatment is considered of the highest importance; put the horse in good quarters—can't move him far; give good ventilation, no drafts, pure air, and soft, digestible (very little indigestible) food. For this purpose we use oatmeal and linseed meal, and boiled barley or hay tea. Bear in mind that the lining of the bowels

is in an irritable condition and may run into Enteritis. In GRIP they find the micro-organism attacks the red blood corpuscle and destroys it, leaving the blood in an impoverished condition, and as a result great nervous prostration follows. Stimulants are indicated, depletion is contra-indicated; whisky is indispensable; never do anything to deplete the system. Aconite, tartar emetic, calomel, etc., are contra-indicated, also blood-letting. To the whisky you may add strychnine, atropine, etc., but in this case never use the ammoniacal salts, as they thin the blood. WHISKY is the sheet anchor; quinine can be given in liberal doses, as it reduces the temperature without depressing the heart. Antipyrin or acetanilid may be given in small doses; they are coal-tar preparations and depress the heart some. Try to reduce the temperature from 106 to about 103; in that way you will lessen the danger of complications. When confined to the head and throat, blanket warmly; laxatives are dangerous, and may cause fatal Enteritis; leave the bowels alone; treat the heart mainly, and give good hygiene, and let nature do the rest.

In GRIP the latest treatment is hypodermic injections of strychnine, that is in the human. Strychnine and atropine are excellent remedies as stimulants, so if you can't get whisky use them. Give long rest; recovery, as we said, is very slow.

MALIGNANT CATARRH OF THE OX.—This is looked upon by many as an infectious disease, but does not seem to be communicated by either contact or inoculation; it is probably like Malaria in the human; it doesn't seem to be contagious, but is rather due to some miasmatic influence that the cattle are laboring under, so that though many in a herd may have it, they all get it from a common source, which is probably miasmatic or Malarial. We find the disease is of a malignant catarrhal nature, affecting the mucous lining of the upper air passages, including the sinuses of the head; as the frontal sinus opens into the horn, it may be affected also. The disease occurs mostly in cattle pasturing on low lands, and more particularly in cold, damp weather. It resembles Rinderpest or Russian Cattle Plague. The germ has not yet been discovered. The disease is so severe in some cases that the ox pines away and dies; and is so malignant as to be called by some, Cattle Glanders—but that is rather a misnomer. It is distinctly Typhoid in its nature.

Semeiology.—Rigors, high fever, dejection, nervous prostration, injection of the mucous membranes in the early stage; in the latter they become darker. Later on there is a thin mucous discharge from the mucous surfaces, the nose particularly; eyes are watery, horns usually very hot; a rap on the horn causes pain, also percussion over the sinuses. In the early stage there is Constipation, in the latter approaching death, there will be a foetid Diarrhoea; the discharge that was mucous now becomes muco-purulent, that is from the nose. Eruptions occur in the nostrils, often there is ulceration of the nose and lips; they differ from Chancre in Glanders, but resemble malignant pustular Eczema. Swelling often suppurates, develops between the rami of the lower jaw, and in other parts of the body;—a good deal like Strangles in the horse. The inflammation in the sinuses is sometimes so severe as to cause the horns to slough off; that is in an excessively severe case. Sometimes in malignant cases there is sloughing off of the skin in patches, on different parts of the body, particularly on the legs. This disease in that respect resembles

the foot and mouth disease. Death occurs in from three to ten days if it proves fatal; but where they don't die, they are sick for a long time; recovery is slow.

Treatment.—Remove the cause; put the cattle on high ground; night and early morning is the worst time, so put in at night and don't let out till about middle of the morning. Treat fever same as any other fever; don't deplete. Aconite and belladonna may be all right in the early stage. During convalescence and throughout, give quinine; tonics are now indicated. If the discharge from the nose is profuse and very ichorous, steam with medicated water, using carbolic acid or iodine several times a day.

PURPURA HÆMORRHAGICA.—This has heretofore been considered as a non-contagious disease, but in 1889 two Italians, Fizzoni and Giovannini, discovered the specific Bacillus which now classifies the disease as infectious. This discovery was corroborated in 1890 by a Frenchman named Babes, and in 1891 by a German named Kolb; so it is now accepted by all as an infectious disease. The Bacillus has round ends. As regards its nature, it is classified as a blood disease with extensive swelling of the legs, under the abdomen, muzzle and other parts of the body; there are eruptions and Ecchymosis. We often see it following some debilitating disease previously existing as Influenza or acute Catarrh, or it may arise as an original lesion, in which case we usually see it more severe and oftener fatal than in other cases. Of late years it has been seen more as an original lesion, without any predisposition whatever and is often fatal.

Etiology.—The Bacillus is the prime cause. In the majority of cases it arises in basement stables where there is bad drainage and ventilation, and a crowded condition; under such circumstances the disease is common. We find as regards the pathogenesis, that the main feature is the extraordinary change taking place in the blood; it becomes deficient in red blood corpuscles and albumen, and nearly as thin as water, and light in color. This thin condition of the blood is naturally accompanied with an atonic condition of the walls of the blood vessels; this comes from a lack of proper nutrition. The atonic condition of the walls of the blood vessels and the thinness of the blood allow a transudation into the surrounding tissues, and this gravitates to the most dependent part, producing a swelling.

Semeiology.—The symptoms are quite characteristic; it is quite easy to diagnose a case. In the earlier stage of the disease there is high fever, usually from 104 to 106, but in general about 104. If the animal dies towards the last, the fever will be from 105 to 106; this fever is apt to be intermittent, coming and going up and down. The next thing we notice is swelling in some parts of the body, more often in the legs, from the hocks up to the knees, or around the mouth; perhaps one lip may be swollen and hard, but when it arises as an original lesion we will find the whole muzzle swollen. The legs swell from the hock up, and the swelling gets higher up as the disease progresses, and also gets wider as it gets to the top, and always has an abrupt termination. It may be about $\frac{3}{8}$ of an inch at the hock, and from two to three inches at the knee. When the swelling reaches the body it usually runs along the under side of the body, along the belly; the sheath swells, and

in the mare the skin around the mammary glands becomes filled. During all this time the muzzle is swelling, and also has the abrupt line of termination. But soon after the fever sets in, and before the swelling, you will find cachexia spots on the mucous membranes, especially on the Schneiderian, and buccal, also on the vagina, rectum, etc. These at first are cachexia spots, but in a day or two get larger and finally become patches of Ecchymosis. They are local extravasations, actual hemorrhages into the cellular tissue. In the course of two or three days there is an offensive discharge from the nose, which is very fœtid; the saliva from the mouth is also fœtid. About two or three days after the disease sets in, an offensive, fœtid discharge seems to ooze from the skin of the legs and belly and trickles down in a gummy amber-colored fluid. The appetite may remain good, but animal can't eat on account of the swollen muzzle. Sometimes the tongue swells so much it will protrude from the mouth.

A very prominent feature of this disease is the cessation of secretions from the bowels and kidneys; they become very inactive—will often go four or five days without passing water from the bladder; this is a remarkable symptom in this case, and is probably due to lack of nutrition. As death approaches we find the breathing becomes very labored, partly due to the swollen condition of the nose, the cavity or calibre being diminished. This causes great Dyspnœa, and when the swelling gets to the eyes the breathing is very labored; the horse can't hold up his head, and the swelling often reaches the pole; he becomes blind, persistently stands, and finally goes down exhausted, and soon dies. They often die suddenly from the infiltration reaching the brain; this may happen in a mild attack, but the cause of death then is *Embolism*, as the circulation during this disease is very weak; the pulse is weak, irregular and fluttering; ante-mortem clots are liable to form, and then Embolism. As the hind legs swell the horse can't move, and instead of Constipation in the last stages, there may be a bloody Diarrhœa, due to the extravasation of blood into the bowels.

Treatment.—Give good hygienic treatment, that is of the highest importance; pure air—don't leave in basement; soft food, warm clothing, and keep quiet.

Therapeutical Treatment.—Williams recommends chlorate potash, but we find they all die when so treated—potash has a tendency to destroy plasma in the blood. Others prescribe turpentine; this is useful in three ways—first, as a diuretic, and they need that; second, as a stimulant, and they need that; third, as a germicide; so you see turpentine is very good. Some use fl. ext. of ergot and claim much benefit from it; it contracts the walls of the blood vessels, hence it is rational. But we rely on three drugs—iron, spirits of nitre, and quinine. Tinct. of iron is the sheet anchor; give in drachm doses in bad cases, every hour for two, three, or four days; give in two ounces of water. Spts. of nitre may be given in the same dose and at the same time, and may be combined with the iron. Give quinine—about midway between a tonic and a febrifuge dose—say in one half dr. doses every three or four hours. In less severe cases give the iron and spts. of nitre every two, three, or four hours, according to the severity of the case. We usually mix them all together. In addition to this, bathe the muzzle with hot water continuously to

drive the swelling to other parts of the body; bathe night and day; if the internal treatment doesn't reduce the swelling, don't pay any attention to the swelling in other parts of the body except the head. It may be that sometimes the swelling may affect the pleural cavity; that is the exudation into it may cause suffocation, but we must take the chances. Let him eat if he will, and give him good strong feed. Under this treatment only about twenty-five per cent die; under the old, ninety-five per cent died. Don't use cold water, astringents, nor by any means scarify, as it does no good, and will cause inflammation and sloughing of the skin. Always elevate the head so he will not hang it. In case the swelling of the muzzle doesn't go down, then as a last resort perform tracheotomy, it gives the horse one more chance; but their chances are poor when they reach that condition, as they seldom recover. In autopsy you will find a bloodless condition—the blood in the blood vessels will not be coagulated; it is too thin, and there is a general infiltration.

SCARLATINA.—This very closely resembles Scarlet Fever in the human, and also *Purpura Hæmorrhagica*; but there are many distinct features. It usually arises from deficient hygiene, but must be infectious, as an affected animal put into a stable full of horses will communicate it to all. The characteristic features differentiating it from *Purpura Hæmorrhagica* are in the first place, the cachexia spots are smaller and remain so, while in *Purpura Hæmorrhagica* they become Ecchymosis; sometimes in Scarlatina they form patches by coalescing, but not by extravasation. In Scarlatina these spots are scarlet, in *Purpura Hæmorrhagica* they are purple. In Scarlatina there is sore throat—never in the other. In *Purpura Hæmorrhagica* the swelling is smooth, with abrupt termination; in Scarlatina it is in patches and lumps, over the head and neck. In Scarlatina the lymphatic glands frequently suppurate, they never do in *Purpura Hæmorrhagica*.

Treatment.—The fever seems to run the same as in *Purpura Hæmorrhagica*, but not so high. If it was a sporadic case iron would aggravate it, but in a specific case it is indicated; so the same treatment will apply to this as to *Purpura Hæmorrhagica*. Apply mild counter-irritants to the throat, or poultices; keep up strength; give boiled eggs, and milk and barley. Some recommend swabbing the throat with a solution of nitrate silver—ten grs. to the oz. If an Abscess forms, open and syringe out with antiseptic. In fatal cases, as it approaches death it seems to run into *Purpura Hæmorrhagica*, so the termination is the same in both cases; may be the same from about twelve hours before death. In Post-Mortem it is about the same as in *Purpura Hæmorrhagica* except that there is not so general, but a more local infiltration than in *Purpura Hæmorrhagica*.

The Dog is subject to nearly all the diseases common to man; pathology is much the same. The dog is the most sensible, and sensitive as well, of all the lower animals, and medicine has a greater effect on him; so you must be careful in treating not to give anything that will cause him to vomit, as you will then find it very difficult to treat him. A dog's stomach is very sensitive to the action of drugs. They have strong expression in their countenances, and show many of the same feelings as the human, in their expression. We may say the same rule that governs the application of medicine in the horse applies to the dog, only

you must remember the size, and the effect of drugs upon the dog. I find that the doses laid down for the dog in Finley Dunn, are as a rule much too large; in many cases the minimum dose would suit better than the maximum one.

CANINE DISTEMPER.—Is purely a canine disease, and resembles measles in the human very closely. It is an infectious catarrhal fever, and seems to arise spontaneously in some cases, but as we believe it a specific disease we scout the idea, though can't explain. It has a variable period of incubation—from a week to a month, with a general average of eight or ten days. It is a specific blood poison. In the uncomplicated form it is very mild, but it is prone to develop complications very frequently—such as will prove fatal. The parts invariably attacked are the upper air passages and eyes; that is in the simple uncomplicated form. It is considered a puppyhood disease; as a rule it occurs between three and nine months though I have seen it in dogs four years old. The disease resembles measles in children so closely, that many physicians say that it will give measles to children by having a dog with canine Distemper in the house. Others say it will also cause Typhoid Fever, but there are some differences between the symptoms of it and Typhoid Fever. Canine Distemper in the complicated form may attack the brain and cause Epileptic fits; or it may attack the peripheral nerves and cause Chorea; then the spinal cord and covering may be attacked and cause either partial or complete Paraplegia; or the bowels may be attacked and cause fatal Diarrhœa or Dysentery; or the lungs may be attacked and cause Catarrhal or Bronchial Pneumonia—which is the most common complication. This disease is no respecter of age, sex or condition, though well-bred dogs seem to suffer more than curs, especially those inbred; they take it oftenest in the malignant form. The mortality among well-bred dogs is terrible, and the disease seems to be increasing. About nine tenths of the deaths of Welland setters is due to this disease. One attack renders immunity from a second one, as a rule; that proves the specific character of it. The germ has not yet been discovered. Some think it resembles Scarlet Fever in the human, but we know it resembles Measles more than anything else. The mild form runs a mild course and terminates favorably; in this there are eruptions similar to those in measles.

ETIOLOGY.—The cause lies in some specific poison not yet isolated.

SEMEIOLOGY.—Rigors, the first thing; first severe, then minor; for the first four or five days they have shivering fits, then are burning up; temperature from normal runs up to about 104, pulse rapid, may run from 120 up to 175, or may run so high you can't count it; mucous membrane of the eyes is very red, nose hot and dry in the early stage; restless at first, then this passes off and they are languid, which increases; usually there is complete loss of appetite, and thirst is increased, that is after twenty-four hours; emaciation is rapid in all cases; urine is scant and high colored, bowels at first constipated, later there is Diarrhœa; fæces is horribly fetid, black and tarry—that is almost characteristic; it may stay black, or may run into a watery Diarrhœa. Usually from the start there is sneezing and coughing; after twenty-four hours the mucous discharge coagulates in the corner of the eyes. In three or four days this discharge becomes muco-purulent, both from the eyes and nose; this

glues the lids of the eyes together and confines the pus, and if not allowed to escape may cause Corneitis; often causes the cornea to rupture, allowing the escape of the aqueous humor. Where the inflammation is inclined to run down the cough will become hoarse and deeper; in the second stage respiration increases; animal will hug up around the stove. We will hear all the ordinary sounds of Pneumonia by percussion, when it takes that complication. In the difficult breathing they act the same as the human in inspiration—they draw the air through their teeth and the lips are drawn back; in expiration they puff out the cheeks; they don't usually pant or show the abdominal symptoms seen in the horse; the breathing doesn't increase much in frequency, but is labored, and the countenance is anxious. It takes from about five days to three weeks for a case to run its course. The fits, when Epilepsy is present with it, may be continuous—that is recurring, or they may come on three or four times a day, as a rule about one half dozen in twenty-four hours. If the skin complications in bad cases are caused by bad circulation, we have sloughing off of the skin in patches, forming ulcerating sores; these usually indicate death, though they sometimes recover. If there are any complications, never give favorable prognosis; if there are none you may.

TREATMENT.—If taken early, a mild laxative is indicated—oil of cascara, or buckhorn, is good, but give no drastic purgative; some give mercurial laxatives. Aconite in the early stage is good in small doses, though it would seem to be contra-indicated; as a rule heart depressants are not indicated in specific cases or diseases, but rather stimulants. Belladonna is good, but remember that the dog is very susceptible to poisons, and this is rather dangerous. Quinine from the start is an excellent remedy; to a Llewellyn puppy six months old, give two grains quinine every two or three hours, in an ordinary case; then as he recovers drop off, first on the frequency, then on the dose. Nitric ether is good in the early stage; some say hyposulphate soda is good, but I have not been able to do much with it. I find that tonics and stimulants work the best, with a little iron, even in fever it does no harm.

Iron is contra-indicated in sporadic cases, but is good in Specific Fevers. In dosing a dog with any drug, be very careful of upsetting his stomach, and if you find a dog vomiting and can't keep anything down, for instance a setter, give ten grains of subnitrate bismuth, and repeat every two, three or four hours for a few doses; this is one of the best remedies I know of for this. The receipt for canine Distemper that we use is:

R	Elix. Cal.Fer. Bis.	1 oz.
	Pot. Acet.	1½ drs.
	Spts. Nit. Ether	2 drs.
	Aqua	1 oz.
	Syr. Tolu, ad to make	4 ozs.

Dose, dessertspoonful every two or three hours, or three or four times a day, and prescribe quinine in separate mixture; mix it with glycyrrhiza to hide the taste; in case of great weakness give sherry wine—one half to one teaspoonful doses, well diluted; to a setter puppy carry this out till convalescent, then you may give elix. cal. and strych.

In case of lung complications use linseed poultice with a little mustard in it, that is if the animal is kept in the house; if in the barn, rub

mustard plaster into the hair and wrap with flannel. If it goes to the brain and causes Epileptic fits, give bromide potash 10 grs. to the dose, three, four or ten times a day—three times for a mild case, and give a dose after each fit; continue the other treatment just the same. In case of Chorea, valerianate of zinc alternated with valerianate of ammonia in small doses, or nitrate silver in pills, is good. If the bowels are affected they require little or no special treatment, except good hygiene as to diet; it is well to break a raw egg in the mouth three times a day for a six months old puppy, to keep up his strength; that will also loosen the bowels; if it purges give beef tea or broth with rice, bread and milk, etc. Paralysis in the dog usually yields to treatment, but for some reason, I can't explain why, I can't do anything for bitches. Strychnine and iodide potash is rational treatment; give six months old puppy $\frac{1}{4}$ gr. strychnine three times a day; may increase to $\frac{1}{2}$, $\frac{3}{4}$ or $\frac{1}{2}$ of a gr., but watch closely till you get the effect; in case of poisonous dose, give large dose of bromide potash. Of the iodide potash, start with 1 gr., then run up to 5 grs. then back to 3 grs.; it takes from one to three months to get them all right. In convalescence after Chorea, give arsenic (Fowler's solution), about a drop three times a day for three days, then increase a drop a day till you get to ten drops, then drop down for a month to five drops, and alternate.

The vitality of the specific poison is great, so scrub out the kennel with hot water and corrosive sublimate, then fumigate and whitewash.

RHEUMATISM.—This is a constitutional blood disease of a very peculiar kind, being neither contagious nor infectious, but one that is not well understood as to the cause. After experimenting, we have come to the conclusion it is due to an accumulation in the system of some unnatural acid. This in the human is thought to be lactic acid; in the lower animals it may be the same acid, or hippuric acid, or both; that is in the herbivora, the omnivora and carnivora, it may be lactic acid. As a rule it is an inflammatory disease, and may be very acute, or it may be mild and cause no inflammation, but considerable pain. When it attacks a certain part and produces swelling, it is then known as Inflammatory Rheumatism. But when there is no enlargement with the pain, the name inflammatory is not used; it is simply spoken of as Rheumatism. This inflammation is sometimes very acute, but the peculiarity of it is, it is not suppurative, so is not inclined to form Abscesses. In cattle, especially in the young, they will lie down in pain, sometimes on hard floors, and so bruise the part as to cause suppuration, often around the fetlocks; the joints become bruised and form Abscesses and then there is suppuration. Horses will not lie down, so we don't see this in them. One peculiarity of the disease is that it seems to locate along the sheaths of tendons, in the tendons, synovial membranes, or their fringes, and in ligaments, or in a muscle, or set of them. It may attack the periosteum, and from that extend into the bone, sometimes in the pericardium, causing Pericarditis; or in the endocardium, causing sudden death. Sometimes it affects the intercostal muscles, causing Pleurodynia, and then you may have many of the symptoms of Pleurisy; sometimes it attacks the trunk nerves, more particularly the Sciatic; it is then called Sciatica; sometimes it attacks a set of nerves and extends all over their distribution, then it is called Neuralgia.

Etiology.—Sir Richard Critcherson found by injecting an infusion of lactic acid into a dog, that he could produce Rheumatic Fever with characteristic lesions of Endocarditis, etc., also of the aorta valves: When the disease is general throughout the system, with pains everywhere and fever; it is spoken of as Rheumatic Fever; and if the heart is not affected it is liable to be so at any time and prove fatal. A predisposing cause of this disease might be due to a faulty assimilation or faulty character of the food, as we see in dogs fed exclusively on meat diet. They are very prone to the disease; it is so in people, while vegetarians seldom have this disease. It is almost invariable with people who use much meats and sour wines; particularly in those of sedentary habits. The next predisposing cause is a Rheumatic diathesis, or commonly speaking, hereditary. Another cause is the presence of effete material in the system, causing an unnatural acid. This effete material may be the result of some previous debilitating disease, as Influenza, that should have been eliminated from the system. This debris predisposes to acute Rheumatism; we find this in the disease following Influenza in from two to six weeks; it usually locates in the sheaths of tendons of the fore legs particularly, and from the knee to the fetlock; it may be swollen, then in three or four days it may leave this place and locate in another leg in the same place, or in another place, or it may stay in the first place as well; or the swelling may remain and the soreness leave. Another predisposing cause is the condition of the system that leads to over-production of fibrin in the blood; the normal amount is about 2 in 1000; in this you will find sometimes 10 in 1000. Then it is due to the changes produced by the Rheumatism; the urine is altered; in the herbivora the urine should be slightly alkaline, in the carnivora and omnivora it should be either neutral or slightly alkaline. In the herbivora in this disease it becomes acid; in the carnivora and omnivora it becomes exceedingly acid. This is looked upon as a proof of mal assimilation. There may be predisposition for a long time in the body, but requires an exciting cause to develop it. This is usually exposure to severe cold and damp.

Semeiology.—We find it among cattle poorly kept,—as without shelter, etc.; in such case the first thing is acute lameness; there may or may not be swelling; with swelling there is more or less fever. In case of Rheumatic Fever there are flying pains in different parts of the body. Taking the hock joint as a case, the poison attacks the synovial membrane and its fringe, or the ligament or tendon; there is great pain and soreness on pressure, lameness and constitutional disturbance; pulse rapid, hard and small, or instead of rapid, may be quick; mouth hot and dry; there is fever—may be 104 or 5; pulse may be small and hard; blood drawn will coagulate quickly and hard—this is due to increase in fibrin. Affected parts are hot and sore to the touch; swelling is hard, due to the infiltration of the exudate into the cellular tissues, and being near a joint there are osteoblasts surrounding, so the result may be that the enlargement becomes partly ossified, even causing Anchylosis. Where it attacks the periosteum it attacks the bone, and bony spicula shoot out through the articular cartilage; the cartilage is often destroyed, and the exudate becomes ossified, or rather becomes like porcelain, as it really is a porcelainous deposit. In case of acute inflammation and sloughing in cattle, it often opens the joint. In case of Rheumatism in the joint,

where it attacks the synovial membrane, it causes a deposition of bony deposit in the fringe of the membrane; this is often the cause of a peculiar lameness in old horses, where they suddenly go lame and as suddenly get well; it is due to the bony deposit of the membrane working in between the articular joints, and as quickly working out again, leaving no lameness. Sometimes where Rheumatism affects the heart and is not severe enough to kill, it produces ossification of the walls. In mild cases in the horse, he may be lame for a time and get well, and then get lame again; in such a case he is not always lame in the same foot, it moves around and may be in different parts of the body; this is called Metastasis or Flying Rheumatism. Acute Rheumatism is liable to run into chronic any time; the chronic often develops from subacute attacks.

Treatment.—Put animal in comfortable quarters and clothe warmly. If he has had Influenza and got well and this has developed, give mild laxatives—never purgatives; give moderate dose of aloes, little over $\frac{1}{2}$ dose. Put dry flannel loosely around the affected part; use anodyne liniment if he is very bad—as aconite, laudanum, and water; you may add carbolic acid to this. Put the liniment on hot, then give something to change the character of the blood—salol is the best now, it is the popular remedy. Salicylic acid (salicylate soda), iodide potash, and colchicum are good, both in human and veterinary practice. If you wish to give any other internal treatment, give stimulants—salol in 1 dr. doses 3 times a day, and if very bad give 1 dr. every hour, and if no good results in 48 hours, change to one of the others; then if no good results in 48 hours, apply cantharides blister to the parts; this will often relieve when the animal is suffering intense pain. In case of excessive pain, you may allay with hypodermic injection of morphine. You may increase the action of the blister with a linseed poultice. In cattle, if there is sloughing, treat the part affected as a simple wound. During convalescence from acute Rheumatism give tonics—nux vomica, gentian, etc., and digestible food. If it attacks the pericardium, apply counter-irritants to the side. In the case of Neuralgia, quinine is good, and also the compounds of coal-tar—as acetanilid, antipyrin, etc. In acute Neuralgia, give combination of bromide potash and gelsemium, that is almost a specific. Then after giving that a few hours, follow with quinine, and follow that with tonic doses of nux vomica or gentian. There is a kind of Rheumatism that horsemen call CORD, in which the muscles of the neck get stiff and contract, causing Wry Neck.

LYMPHANGITIS.—Is inflammation of the lymphatics. It is known by various common names, but mostly in this country as MONDAY MORNING DISEASE. It usually occurs in draft horses on Monday morning, due to the Sunday rest, and with full heavy feed kept up. We find in most cases that it follows high feeding during periods of idleness. It often occurs in the hind limbs, but not always; it may attack the fore leg. In the hind leg it usually makes its appearance in the chain of lymphatics running down the inguinal canal, along down the tibial region. When the fore leg is affected, the brachials are usually affected, attended with great soreness, fever, swelling, and lameness. It is more often seen in draft horses, probably because they are phlegmatic and have not such high temperament as the thoroughbreds, so we find about 99 out of 100

cases affected are draft horses. They are much heavier feeders, and in the stable are more quiet, not restless like the thoroughbreds.

Etiology.—It is supposed that the cause lies in the excessively rich condition of the blood. It is hard to realize the pathogenesis as the immediate cause of the inflammation, but there is too much chyle poured into the blood; this loads it with nutrition, and as a result the blood becomes plethoric; then as a result of this the lymphatics become congested with lymph and chyle, the same as other parts become congested with blood; there is a stoppage in the circulation, and as a result there is inflammation. This is the common cause. Occasionally (but rarely) we have another form that occurs in debilitated horses; the combustion in that case is caused by the lymphatics becoming plugged with debris, the result of rapid tissue metamorphosis, particularly when the system is living upon itself, without any food being taken into the body, and with combustion going on just the same. In such a case the fibrin is greatly increased, so that it interferes with the circulation of the blood. In the first case it is mechanical plugging, in the other it is plugging with the debris from tissue waste.

Semeiology.—Almost invariably a chill, either visible or not; this may be very severe or very slight, but as a rule in plethora it comes on with a chill lasting from 4 to 10 hours, and long before the chill stops we have a high fever developed; the height of the fever is usually in direct proportion to the length and severity of the chill. Then following the rigor (in the early part of the fever) there is restlessness; lameness develops in the affected limb very soon after the fever subsides. The animal now becomes quiet because it pains him to move. As a result of the fever we have an accelerated pulse—rapid, full, strong and bounding, with a tinge of hardness; the respirations are much accelerated, so much so that you may think it a case of thoracic trouble; this is probably due to the pain; respirations are often from 20 to 25 per minute. The mucous membranes are injected; sometimes from the pain, they sweat at the flanks. Colicky pains are sometimes quite prominent, probably due to the mesenteric lymphatics being affected; the bowels will naturally be constipated, urine scant and high colored, and if tested, an excess of urea will be found; hippuria in cattle particularly. The local manifestation is a line of swelling along down through the inguinal canal, down the inside of the thigh, a ropy-like enlargement from the size of the finger to that of the wrist; this swelling is extremely sensitive to the touch. It usually starts in the inguinal ring and extends down gradually; it takes about 24 hours to reach the hock. This swelling is attended with rapid exudation that infiltrates into the surrounding tissues, so that in the course of from 24 to 36 hours there is a Big Leg from the body to the ground. If you cause him to move, which he is disinclined to do, he will be very lame; appetite is completely lost. If left to himself the inflammation subsides, but it leaves more or less enlargement of the leg, due to the partial organization of the exudate. This enlargement is known as ELEPHANTIASIS, and in this case we get a typical form of it. We don't get much swelling in the first attack, but if left to himself, particularly if he is compelled to work, this will cause it; but if left in the stable he has no appetite, and as the fever causes thirst he will drink much, the blood will thin out, the kidneys will be cleaned out, and he will make a nice recov-

ery. One attack predisposes to a second, and every succeeding attack leaves the leg a little larger than it was before; so in about three attacks the horse has chronic Big Leg; this is due to the exudate organizing and becoming largely fibrous.

Treatment.—The first thing we usually do is to give full purgative dose of aloes; then put up mixture of aconite, nitrate potash, and (with a view of preventing any unfavorable results from the aconite) we include a little spirits of nit. ether; we usually give maximum dose the first 12 hours. Receipt is:

R	Aconite fl. ext.	1 ½ drs.
	Potash Nit.	2 ozs.
	Spts. Nit. Ether	2 ozs.
	Aqua ad to make one pint.	

Dose, 2 ozs. every hour; that will last eight hours, then your ball will have begun to act. Give the ball first, then this right after it; with this you can control the fever and get the kidneys working. Next thing is to bathe the fore and hind parts with hot water vigorously, an hour at a time, three times a day; after bathing wrap up warmly; tie the end of a blanket at the pastern and wrap upward and around the body; blanket should be dry. Give nothing to eat, but all he wants to drink; keep quiet, no exercise for from three to six days; by that time the inflammation has subsided, much of the swelling will be gone, the kidneys and bowels working good, and as the swelling goes out without exercise, keep quiet. After swelling is gone, appetite good, and animal feels good, give 10 minutes' gentle exercise three times a day for a few days, then increase to fifteen minutes and so on. The trouble is that horses are put to work as soon as the swelling is gone, and the next night it is back again in the leg, and this will be repeated till the horse gets chronic Big Leg. If good treatment is followed there will be no predisposition to a second attack; that is if good prophylactic treatment is carried out by the owner—for instance, feed horse lightly through the holidays; on Saturday night no grain, but large sloppy mash instead; Sunday morning and noon, half rations of grain and dry bran; Sunday night, full feed of grain. In acute case, if it occurs in cold weather and you have no warm stable for your patient, it is then impracticable to bathe with hot water, so don't use water at all; give internal treatment just the same, but for local treatment use mercurial ointment diluted with equal parts of lard; you will have to write a prescription for this:

R	Unguentum }	2 ozs.
	Hvdrgeri }	
	Adeps	2 ozs.

Rub this well in with friction over the affected parts, three times a day; use it quite freely, not thick, but with considerable of friction. In that way you can reduce the local inflammation and increase the absorption of the exudate. We prefer the hot water where practicable, but this makes a good substitute, especially in cold countries.

AZOTURIA.—This is a non-contagious blood disease of the plethoric type, almost if not entirely peculiar to horses, though some say it exists sometimes in the human. It is characterized by sudden prostration; usually there is inability to rise when the horse is down. It invariably follows exercise after a period of enforced idleness and continued high feed-

ing, especially on highly nitrogenous food, as oats. In such a case there is an excess of nitrogen developed in the system as a result of the exercise, and there is more nitrogen and other waste material than the excretory organs can take care of. It occurs in all ages and breeds, in both sexes, but we find it among the half-breed draft horses more than in the full-blooded horses, probably because the half-breed is more violent than the other in his exercise after a period of idleness.

Etiology.—As said, it is due to idleness, high feeding, and exercise after; in this condition (plethoric) the animal often gets itchy, and sometimes in his struggles he gets down and becomes caught in some way, and in violent attempts to get up he brings on the disease. Another cause is when Indigestion causes colicky pains, and in his suffering his struggles cause the disease, that is in Indigestion from idleness, etc. Another cause is, if a horse is brought to you that must be cast for an operation, and has not been prepared by dieting, in his struggles when he is cast he may bring it on. In idleness with high feeding, the animal gets very plethoric; the blood gets rich in solids at the expense of the watery constituents, then in addition to this rich condition of the blood, idleness tends to a faulty activity of all the organs; they do their work in a lazy manner, and this interferes with the circulation. When idleness is at an end, the horse goes out and the exercise increases the circulation; the pulse in some cases may run up to 38, to 50, or 60, and he is feeling good, takes very active exercise, and as a result of this muscular exertion there is tissue metamorphosis; the debris produced in the system by activity is nitrogen, and every contraction of the muscles produces nitrogen, or separates it from the tissues. As we get nitrogen in the food, it feeds the muscles and makes them strong. Oats contain hydro-carbon, and the horse will get Azoturia from them; corn contains carbo-hydrate, and will not cause Azoturia. This surplus nitrogen must be eliminated from the system by the kidneys, or it will poison the blood. The kidneys excrete it in the form of urea, so they must be kept in good condition; the salts and water can be gotten rid of by other ways than the kidneys, but not so the nitrogen. As the blood is rich in solids and deficient in water, so when the heart begins to increase in activity as a result of the exercise, this thick blood cannot circulate freely through the organs, and we get a capillary stasis; the kidneys become congested, and there is an impaction of the capillaries with blood; this interferes with the action of the kidneys, and the pressure on the capillaries of the kidneys is so strong that the coloring matter of the blood is forced out and passes into the urine, giving it the dark color we see when we draw off the urine.

If the action of the kidneys is so interfered with as to cause total suppression of the urine, horse may die in two hours; but if the action of the kidneys is partially carried on, the life of the animal may be prolonged. If he recovers it will be due to the restoration of the kidneys to their functions; if he dies, it is due to the inability of the kidneys to eliminate urea, and uræmia, or uræmic blood poisoning takes place; this is the immediate cause of death. The urine is retarded, but the only danger in that is that the urea contained the nitrogen in it. As the kidneys are congested the other organs are similarly congested, the lungs more particularly; as the animal goes down he is unable to rise, and a peculiar

motor Paralysis takes place, due to the local, muscular Congestion, just the same as in the kidneys; this produces local pressure on the trunk nerves, which produces the Paralysis, and the muscles most generally affected are the gluteal, posterior portion of the dorsal, and the anterior crural region. The congestion of these muscles is sometimes so severe as to nearly interrupt the circulation; this often leads to serious results; it often causes cessation of the functions of the muscles, and as a consequence, a condition of wasting or atrophy follows. Sometimes it causes local gangrene and sloughing, and in some cases the formation of Abscesses, and consequently degeneration. Some of the Abscesses found in the gluteal region may contain 2 quarts of pus. Sometimes the swelling of these muscles relieves them of the capillary congestion, and sometimes will puff out or up 3 or 4 inches, particularly in the gluteal and dorsal. Where the congestion is very intense with little swelling, the muscles get hard, and the pressure on the nerve is then, very severe, often fatal. Usually, but not invariably, the hind parts are affected, sometimes the fore, or perhaps only a set or section of muscles; but more often it is the left hind quarter.

Post-Mortem.—Where death sets in soon after congestion, we will find the muscles, particularly the affected ones, darker colored than normal; the heart is usually filled with black clots of blood—in this it differs from Anthrax; the kidneys and liver are soft; the kidneys, according to the length of time affected, may become gangrened. Where the congestion is not severe enough to produce gangrene, there may be Abscesses found in the kidneys. You will find congestion of the cerebral meninges (Cerebral Meningitis), with more or less effusion into the arachnoid space, also into the spinal canal, and as a rule you will find the animal fat inside, though he may be lean outside. If the blood is plethoric, the animal doesn't need to be fat to be liable to the disease. Animals that are hard worked usually get an abundance of oats, and they are the ones most liable to the disease, though the work may keep down the fat.

Semeiology.—When the horse is taken out after a period of idleness he feels good, and dances and prances around full of life; the distance he will then go depends on the amount of nitrogen created from the exercise of the muscles; he may go $\frac{1}{4}$ mile, or may go from 3 to 20 miles. We will say he goes $\frac{1}{4}$ mile; as he prances along he soon begins to sweat and blow; the last is due to the congestion of the lungs, the other to the congestion of the skin; he soon slows up, looks around, countenance is anxious, gets lame in hind quarter, and the fetlock soon knuckles; that is the first symptom of Paralysis. He is soon dragging the leg, can't bear any weight on it; then the other fetlock knuckles, and that leg soon becomes helpless, and he goes down. During this time the muscles of the back and loins often swell, hard as a board; he may lie quiet a little time, but soon gets restless, has colicky pains, the nerves become intensely excited, pulse tumultuous, weak, uneven, then dicrotic, and there is a convulsive motion of the limb. If you draw his urine in the early stage you might not find any abnormal condition, but in an hour you will find it a dark, coffee color, and thick—the color is due to the coloring matter from the blood; the thickness to the amount of mucous in it. Sometimes it is so thick that it won't flow through the catheter; you can assist it by putting your hand in the rectum. Some fever develops, may be 103 or 4; the

pain and nervousness cause him to make attempts to rise; he can get on his front feet, but his hind parts are helpless, so he walks on his front legs and drags the hind parts some distance.

As the disease progresses and uræmic poisoning takes place, delirium sets in; that is the first effect of uræmia; delirium runs on to comatose condition and finally death, which usually occurs in convulsions. The mortality in the city under favorable circumstances would be 60 per cent, though it may run to 95 per cent; a general average would be 70 per cent. Death usually occurs in from 48 to 72 hours, though the disease often runs on to 4 or 6 days, or to 5 or 6 weeks. Sometimes the urine contains tube casts, hæmatin and hæmoglobin; the tube casts indicate Nephritis. In case of Abscess there will be pus in it; in case of gangrene, gas will bubble out through the catheter. In mild cases the symptoms are partially developed; he may go down and get up again, but there will be pain and lameness in one quarter; this is different from Colic in that respect. The animal often gets well after lying down an hour or two. It seems that a 3 days' stay in the stable is worse than a 3 weeks' period of idleness, because apparently the animal loses the good appetite he has the first day; eats less oats, and the system gradually becomes used to the change; then the capillaries have time to become enlarged so as to accommodate the increased quantity of blood.

Treatment.—If on the street or anywhere, draw off the urine; if you attempt to move without doing so you are in danger of rupturing the bladder; then get him home. If he is very nervous, give to about a 1400 lb. horse, 1 oz. fl. ext. gelsemium for the first dose, then if needed, give about $\frac{1}{2}$ oz. or less, the second dose. It is doubtful if a purgative is indicated, as there is already a lack of water in the system and a purgative would still further reduce it; but the favorable point is that the animal is plethoric and needs depletion. I never got any good from Cleeing, and little from purgatives; usually give average dose of aloes. Diuretics are dangerous; if the congestion is severe, diuretics will surely kill, but if Congestion of the Liver is mild, it will make sure of recovery; still it is dangerous to give them, especially the potassium diuretics—acetate and nitrate potash. Give a mild stimulant:

R	Gelsemium fl. ext.	2 ozs.
	Potas. Bromide.	2 ozs.
	Aqua to make one pint.	

Dose 2 ozs. on an average of about every 3 hours. In addition to this Dr. Ellingwood suggests lith. citrate 1 dr. in water every two or three hours for the first 48 or 60 hours, then drop to 3 times a day; the other receipt is about the same. Williams advises chlorate potash—this will kill every time.

Local Treatment.—Use hot fomentations; wring out rug in hot water and apply over the loins, cover with water proof, then cover with dry blankets; this keeps the steam in. During convalescence give nux vomica; in human, they use ethereal tinct. of juniper. Make it yourself; take 4 ozs. juniper berries, let them macerate in 4 ozs. nitrous ether for 24 hours, then drain off the ether, add 4 ozs. of more the ether and leave 24 hours longer; then squeeze them, add 4 ozs. more of ether and a little alcohol—that makes your preparation. Remember that a horse's chances are much better standing, but if he can't bear about $\frac{2}{3}$ of his

own weight he can be put in a sling. Following Azoturia it seems that Laminitis sometimes develops; if so, treat as ordinary case of Laminitis. If the muscles waste on the hind quarter, treat by stimulating with setons; put in three setons, about 2 inches apart, and leave them in about 6 weeks; then send to pasture or give good long rest. It often takes from 3 to 6 months for the muscles to become strengthened again. If necessary you can medicate the setons with cantharides, turpentine, etc.; be sure to give gentle exercise.

SIMPLE OPHTHALMIA.—Inflammation of the conjunctiva.

Etiology.—Is usually the introduction of some foreign body into the eye, or the extension of some inflammation to the eye, as from the lachrymal ducts in Catarrh or Glanders. It is often caused by facing a cold wind in long drives, this causing Conjunctivitis; or from caustic substances getting into the eye. A very common cause is driving behind a lime wagon and the wind blowing the dust into the horse's eyes, producing Conjunctivitis, or in fact from any foreign body.

Semeiology.—Eyelids swollen more or less; the extreme sensitiveness of the eye causes him to keep the lids partly closed; there is more or less pain, conjunctiva swollen, copious discharge of tears from the eyes; as they can't run down the lachrymal duct, they flow over the cheek. If this is continued more than a day, the inflammation extends more or less to the cornea, with more or less infiltration into the tissues, with a corresponding degree of opacity of the cornea. Some say this opacity is due to interrupted nutrition, but it seems there must be an increase rather; at any rate we say the eye is cloudy; the cornea, which is normally transparent, becomes clouded; this varies in degree.

Treatment.—Examine the eye for the foreign body and remove; this is best done with curved forceps, holding the curved side towards the eye so as not to risk injuring it. Foreign bodies often become imbedded in the mucous membrane, and swelling of the conjunctiva closes around them, so look carefully; you will recognize their presence, as there will likely be a little local swelling where the body is; you can often, as it were, break down the mucous membrane to get at it. A silk handkerchief is good to remove such things as grain, chaff, dust, etc. After you have removed the foreign body treat with anodyne and mucilaginous substances. Common salt and distilled water are good to allay Conjunctivitis - strength, $\frac{1}{2}$ oz. to pint of water. The white of an egg introduced into the eye is also good,—it lubricates the surface and so relieves the irritation; linseed tea or a grain of linseed introduced into the eye is also good. In a very bad case, keep animal in the dark, and apply a little cocaine occasionally; give laxatives, saline diuretics, and sloppy food.

HÆMATODES FUNGUS.—A bleeding fungus; this is a medullary soft Cancer, almost exclusively confined to cattle. It usually starts in small purplish spots on the conjunctiva; it is malignant and spreads, working into the eye and destroying it; and it even works back and attacks the bone. The putrefactive matter from the ulceration causes cachexia, and the animal dies from blood poisoning. This fungus bulges out of the orbit in a suppurating Tumor that bleeds easily.

Treatment.—The only hope is in the early stage, by removing with the knife; if the eye is involved, extirpate it and cauterize; when granulation takes place and fills up the orbit about one half, use white lotion to

prevent further granulation; then get rid of the animal, as the disease is malignant and may break out again.

ENTROPIUM.—This is turning in of one eyelid, or both; they turn in so the eyelashes come in contact with the eyeball and cause great distress and swelling of the lids; cornea is more or less cloudy, and there is a discharge of muco-purulent matter from the eyes; it gives the animal a very objectionable appearance; the eyes are almost always closed.

Treatment.—Is surgical; an elliptical section of the skin of the eyelid must be removed, and the edges drawn together; this shortens the lids; you remove a section the size that the case requires, according to the amount turning in. Prepare the animal with laxatives twenty-four hours ahead; wash off the spot and remove the hair, then with short scissors remove a section of the skin; first run a needle and silk within about $\frac{3}{8}$ of an inch from the eyelashes, then remove the piece; usually take three fine stitches about an equal distance apart. Where it is the upper lid you operate on, it is well to put a few stitches up through the eyebrow to hold the lid for three or four days, to allow the palpebral muscles to contract; then treat the wound as a simple wound. The result of this operation is as a rule pleasing. You will find this trouble very common in dogs.

ECTROPIUM.—Is where the eyelids are too short, turning the lashes out and exposing the conjunctiva; this is not so painful as the last disease, but it is very unsightly. The same operation may be performed, except that it is performed on the conjunctiva instead of the skin. In very mild cases we try first, very mild astringents—solution of sulphate zinc 2 grs. to the oz., or a saturated solution of borax or cold tea, especially green tea; do this three or four times a day; then if that fails, we sometimes sew the lids together, the same as in dislocations of the eye; this usually works very satisfactorily; so it is not very often in these cases that we are required to take out the elliptical section; the zinc may sometimes be used as strong as 5 grs. to the oz. of water.

WOUNDS IN THE EYE.—These are usually from accidents; the most serious is the one that cuts the cornea, allowing the aqueous humor to escape; it is sometimes so severe as to cause dislocation of the lens, so that it tips over out of position. In many cases you can take hold of it and replace it, then apply some antiseptic solution to the wound; it is good to bind on an ice poultice; put the ice in a rubber bag with sawdust or bran. Apply antiseptic once or twice a day, and ice poultices continually. The wound will often heal by first intention.

LEUCOMA.—An opaque cornea; it means a whitish condition of the cornea. It may sometimes be produced by blows, though not severe enough to break the cornea, and if they are not treated properly and in time they will remain permanently cloudy. The more dense and organized the exudate, the more whitish will be the opacity; and the whiter the more likely to be incurable. While it is blue, especially pale blue, there is hope of removing it, but as it gets whiter the chance diminishes. Sometimes there is a white patch on the cornea at the point of injury that may remain permanently, but if the contusion is mild the exudation will be mild, and absorption will take place, followed by recovery.

Treatment.—For local treatment, warm fomentations and anodynes, and later, stimulants; put salt or borax in the water. After using three

or four days, use distilled or fluid extract of witch hazel—the distilled can be used clear; the fl. ext. dilute 75 per cent; after using these three or four days, use an astringent—sulphate zinc 5 grs. to the oz., or nit. silver 3 to 5 grs. to the oz. In old cases, we usually use it stronger, say 10 grs. to the oz. Always use distilled water.

ULCERATION OF THE CORNEA.—Is liable to occur in case of any wound, but usually in canine Distemper when the eyelids become glued together, and pus accumulates inside and spreads, and poisons the cornea; or it may set up ulceration in three or four places and become confluent. Unless the lids are softened and the pus let out, the ulceration may eat through the cornea, allowing the aqueous humor to escape.

Treatment.—Remove the cause; reduce the Conjunctivitis, and touch the ulcer as lightly as possible with lunar caustic. In case the cornea is not ruptured, granulations may occur in patches on the cornea, and be red as beefsteak; in this case, cauterize once every three days with lunar caustic. My cases made good recovery.

KERATITIS.—This is inflammation of the cornea. In the wounds of the cornea we get more or less Keratitis; it is a constitutional disease, peculiar to cattle; it is very common, and often runs through a whole herd. Though we believe it is infectious, we have no proof of it, so wont say that it is; but it is constitutional, and runs a regular course, usually benign.

Semeiology.—Tears run down the cheeks; bright light causes pain, eyelids swell more or less; there is ulceration of the cornea, with considerable opacity of the cornea. The main feature of the disease seems to be in the cornea, with acute Cellulitis. It usually runs four to twelve days, with recovery, but in some cases the cornea becomes punctured, the aqueous humor escapes and the eye is destroyed; usually one, sometimes both.

Treatment.—Constitutional; laxatives and soft food; keep in the dark; use warm fomentations, with salt and water, and don't let the iris remain in one position too long; give or rather introduce a little atropine to dilate the pupil, then if it doesn't contract in a few days, use calabar bean to cause it to contract. After the inflammation runs its course an astringent can be applied to the eye—use zinc sulph. etc.

FILARIA OCULI.—A little thread-like worm which lives in the aqueous humor of the eye, in the anterior chamber; but how it gets there, God only knows. This is common in Canada, I never saw a case here. This worm is about the size of number 60 spool cotton, from $\frac{1}{2}$ to 1 inch long, and looks like cotton. Sometimes it lies quietly, other times flashes around in the humor; this stimulates the secreting glands and causes an increase of aqueous humor, producing great distress and bulging out of the part.

Treatment.—Lay the horse on his back, turn the head on the poll, treat the eye with cocaine, and fasten the upper eyelid back; don't trust to speculum, sew them back with a few stitches. Some give chloroform, I think it unnecessary; take an ordinary scalpel, introduce it at the junction of the sclerotic and cornea, that is on the upper side of the eye; usually make the incision $\frac{3}{8}$ inch long, then with a little pressure on the cornea force out the aqueous humor and the worm will usually come out with it, but if it doesn't, then use forceps to get it. This operation

is called Sclero-Cornea operation. The wound will heal by first intention; the aqueous humor will be renewed, and the eye will be all right. Never make the incision on the lower side, or the humor will run out as it is secreted. Before operation, pass the blade of your knife through a flame to make it thoroughly clean. Treat the wound as a simple one; use cold applications, but they are not really necessary.

AMAUROSIS.—This is sometimes called *GUTTA SERENA*, or Glass Eye. It is one of the most peculiar of the eye diseases; the eye is insensible, and there is total blindness. The cause of this is Paralysis of the optic nerve; it is quite common in people and horses, but rare in cattle and dogs.

Semeiology.—The eye looks full, large and natural, that is to a casual observer; but close examination shows that the pupil is large and round, instead of being oval as it naturally is. It is dilated; you will find him blind, and the eye insensible, that is to light. You might look at it in the dark and not suspect anything wrong, as the eye naturally dilates in the dark, but you will see the difference when taken into the light. Excessive hemorrhage is sometimes put down as the cause of this.

DETACHMENT OF THE RETINA.—In case of excessive hemorrhage, it sometimes occurs between the choroid and the retina; this produces a loss of functional activity of the retina, and may run to Amaurosis, though in Amaurosis it is the optic nerve that is affected. The cause of this detachment may be due to blows on the head, severe fits of coughing, thereby causing hemorrhage between the choroid and the retina. This is quite common in people, horses, and dogs, but is never seen in cattle. It often occurs in horses from severe hemorrhage, as from Castration, cuts from barbed wire fences, etc. It differs from Amaurosis in that it sometimes gets well; Amaurosis seldom does.

Treatment for AMAUROSIS.—Only rational treatment, as *nux vomica* and a little iodide potash; but treatment is unsatisfactory.

Treatment for DETACHMENT OF THE RETINA.—A prominent oculist in human practice gives purgative of calomel first, then after the action of that passes off gives iodide potash. I know one case he treated this way (a dog), and he only got worse. Another good oculist treated the dog afterward with very good results; the sight was pretty well restored. He said that purgatives and iodide potash increased the hemorrhage; his treatment was tinct. iron and *nux vomica* internally, and a few drops of distilled extract witch hazel into the eye three times a day. If the horse doesn't recover from this trouble it will run into a case of *Gutta Serena*.

GLAUCOMA.—This is a disease in which the vitreous humor, which in health is transparent, becomes cloudy. In this case, with the aid of the ophthalmoscope, the retina in the horse can be seen to be of a greenish, almost yellowish cast, while in health it is a peacock blue. This disease occasionally follows or accompanies Amaurosis, but that would probably be because of some other disease extending to the eye and affecting the optic nerve. Cataracts often succeed this Glaucoma.

Treatment.—Would depend entirely upon the cause of the disease, which you should treat, but usually it is an incurable disease.

STAPHYLOMA.—Is so called from its resemblance to a grape; it is a Tumor on the cornea. The cornea in this case becomes solidly opaque

and bulges out beyond its position—often sticks out beyond the lids. The cornea covering the Tumor is usually white. This disease is common in the human and dogs, but is rare in horses and cattle. It occurs in two forms—in one case the Tumor is solid, in the other it is simply a distension of the anterior chamber by the bulging of the cornea; and this is due to an irritation of the lining of the chamber, thereby causing increased secretion and quantity of the aqueous humor. But in other cases it may be from blows on the eye, which set up KERATITIS; the Tumor then becomes fibrous tissue and solid. The bulging kind is the most common; it also grows larger than the solid kind.

Treatment.—In the bulging kind, if it be detected soon enough, puncture and liberate some of the aqueous humor; this may save the eye and prevent the disease. But if it goes too long and you are asked to treat it, it must be removed, but the sight will be destroyed—you can't replace the cornea. The operation is as simple as it is interesting. Anæsthetize the animal, and insert a thread from side to side, putting it about $\frac{1}{4}$ inch apart; then with a sharp scalpel remove the Tumor outside of the threads, bring the edges together with the threads and ligate; apply cold applications after. The union of the edges usually takes place by first intention, then you may put in a glass or rubber eye for appearance. In these operations always run your knife blade through an alcohol flame, for safety as to germs.

LACHRYMAL FISTULA.—Is where the lachrymal duct becomes punctured by violence, fracture of the bone, rupturing the duct, or closing the duct below, thus causing the tears to flow out of the opening instead of into the nose.

Treatment.—Must be according to the morbid anatomy. No rule can be laid down as to treatment, because of the different causes; usually in the case of bone fracture, trephining is indicated. Treat antiseptically; open up the duct in some way.

STRICTURE OF THE LACHRYMAL DUCT.—Occurs from extension of inflammation into it, usually from Catarrh, Glanders, Big Head, decayed teeth, etc. It may occur in two ways—by formation of neoplastic tissue by self-proliferation, or by outside pressure from some cause. In either case we get stricture or obstruction; this may cause either complete or partial obliteration of the duct, and the tears will flow out over the cheeks, causing what horsemen call WATERY EYE.

Treatment.—If the cause is acute or chronic Catarrh, operate on the primary lesion; if that does not cure the trouble, then try to pass a bougie through, or syringe it out both from the opening at the eye and in the nose. It often resists treatment.

RETINITIS.—Inflammation of the retina; this is usually a purely nervous disease, and needs to be treated as such. If treated early depletor motos are indicated, or depressor motos; as gelsemium and bromide potash, with laxatives; keep in a dark place, and following the acute stage, nux vomica, arsenic, and iron may be given. Animal may make a good recovery, but unfortunately the trouble is not noticed in time. By examining the retina you will find it a greenish yellow cast, especially plain with the use of the ophthalmoscope. Retinitis leads on to cloudiness of the vitreous humor, to Glaucoma, and from that to cataracts on the posterior surface of the lens.

IRITIS.—Is inflammation of the iris, and with it is intimately connected the following disease:

SPECIFIC OPHTHALMIA, PERIODIC OPHTHALMIA OR MOON BLINDNESS.—This is the most serious disease of the eye in the lower animals, and is peculiar to the horse alone; it is recognized by all as a constitutional disease. The word Specific refers to it in this respect as being hereditary, but not infectious. We find it runs in certain families; Moon Blind mares are not so apt to have offspring as Moon Blind stallions; they will go blind any time from six months to six years; on an average, between four and six years.

Pathology.—The primary lesion is Iritis; the iris becomes inflamed, and the inflammation extends to the surrounding parts, as the lining of the anterior chamber, extending back and involving the ligaments of the lens, and in some cases back to the retina and choroid. We believe the whole trouble starts in the form of Iritis; this inflammation produces increased secretion of the aqueous humor, and probably a small amount of vitreous humor. The inflammation on the inside of the anterior chamber produces in this case, an increase of aqueous humor, which produces great pressure from the inside and causes a great deal of pain. The next result of the inflammation is exudate. In order to test this, put a little cocaine on the eye and manipulate gently with the fingers, then you can judge the amount of intra-ocular pressure. Next follows organization of the exudate, and the formation of a white deposit at the lower point of the sclero-cornea junction; it will be in the form of a little unnatural white line; often the deposit of the first attack is slight, but the second will be enough to notice it. Next is a ragged condition of the edge of the iris—instead of being round, there will be an irregular line; that is positive evidence of a previously existing Iritis; this is caused by the exudate taking place into itself, and then adhesion with itself takes place; that is in places, giving it the uneven appearance, and each succeeding attack makes it more ragged looking. The next peculiar feature is, that following the first attack it often clears up, then after a variable period of from four weeks to four or five months, the inflammation will reoccur and continue to do so from time to time till cataracts form, causing total blindness, then the attacks cease. These attacks as a rule come about once a month. The name Moon Blindness was given it because many thought the moon had some influence in the recurrence of the attacks. The cataracts that form are coagulated deposits of lymph from the exudate; also from the inflammation organizing and forming a dense fibrous capsule; it is then called CAPSULAR CATARACT, or when in the body of the lens is called LENTICULAR CATARACT.

Semeiology.—Swelling of the eyelids is usually the first symptom; then closing of the eye; there is a profuse flow of tears; eye retracts into the orbit, making it appear very small—this often lasts for life. After the inflammation has been in the eye for from twenty-four to forty-eight hours a deposit of whitish-yellow matter will be in the bottom of the anterior chamber; this looks like pus, but is the coagulated lymph; it occurs in every case. The inflammation lasts from two to ten days, then gradually subsides and has a tendency to clear up, and the deposit to become absorbed, and the eye apparently gets all right, then it reoccurs, and

each attack leaves the eye worse, and may cause total blindness in two or three months, or in as many years.

Treatment.—We look upon it as incurable; but treat the inflammation;—give purgatives, then follow with diuretics and cold applications to the eye. To cause dilatation of the pupil, inject a solution of atropine $2\frac{1}{2}$ grs. to the oz., three or four times a day, then if it does not contract after a few days, use calabar bean. Give soft feed, keep the animal in a dark place, and let him rest; this will ward off the cataract for a time. During convalescence iodide potash may help to absorb the deposit, but he will inevitably go blind in time. Dr. Harrison, of Atchison, Kas., says the only treatment is surgical, which is as follows:

Apply cocaine to the eye, dilate the lids with a speculum and put a twitch on the nose—there is no sensation; take a fine-bladed knife (made for the purpose) about $\frac{1}{8}$ inch wide, introduce the blade at the lower sclero-cornea junction; leave the knife in for an instant, then turn the blade a little and squeeze some of the aqueous humor out alongside of the knife blade, about $\frac{1}{3}$ of the humor, or till it becomes soft. Nothing more is needed except in case inflammation occurs, then use cold applications. There is no danger of Fistula in this case, it heals by first intention. The trouble doesn't often re-occur, but in case it should, tap again. The above operation, by removing some of the aqueous humor, relieves the intra-orbital pressure.

DOCKING.—There are two ways of doing this—one with the docking shears, the other by laying open the tail in a V-shaped cut, with the point of the V up, then cut off the bone at the upper part, slightly sear the ends with hot iron to arrest hemorrhage, fold the cut ends, pack with oakum, fasten it with some of the hair of the tail, then tie the tail up with the rest of the hair, so that the tail will be held up; remember that the lighter you sear it the sooner it will heal. The rule for a horse of from 900 to a 1100 pounds weight, is to leave 8 inches of dock; in a horse of from 1100 to 1200 pounds weight, or more, leave 10 inches; but you will have to be governed by the length and size of the horse, the shorter the horse the shorter the tail. Where you use the shears, tie a string around the tail, evenly and fairly tight, and with a quick, strong cut remove the tail, then remove the string and sear the ends and treat as in the other case. If you wish to set the position of the tail before docking, suspend it in the shape you want it for ten or twenty days. There is a state law in Illinois against docking, but with the clause that unless it be a benefit to the animal it is forbidden; that will let you out.

SUNSTROKE.—Also called Heat Stroke by medical men, because it often occurs when the patient has not been exposed to the sun, but is overcome by the heat. It is also called **INSOLATION**, but this only applies to the trouble due to the influence of the sun. Anhydræmia, as based upon the pathology existing in this case, means an absence of water in the blood, which becomes thick and dark. Sunstroke is simply prostration from heat, usually in very hot weather, especially when there are thunder showers and a low barometer. It occurs more often in July and August.

Semeiology.—The animal may be going along all right but will suddenly get dizzy and weak; after sweating profusely this suddenly stops and dries up; he begins to pant, nostrils dilate, hangs the head, then

finally goes down. In some cases he will become completely prostrated, will lie flat on the broadside; occasionally there are convulsive movements of the limbs, which are insensible as in the human, then they go down, and may die in half an hour. The temperature may run up to 109, 110, or 112; 109 is common in these cases, but as a rule when it reaches or goes over 108, the prognosis is unfavorable. Humid conditions make it more likely to occur, as we see New York has more cases than Chicago, Boston more than New York, and all of them more than inland cities; so it must be that the amount of water around has some influence.

Treatment.—If the temperature stays at 105 or above for any length of time, it is sure to be followed by serious results; so the first thing to be done is to reduce the temperature as quickly as possible; the best way to do this is by showering, which is better than the old system of packing in ice, which reduces temperature but is often followed by softening of the brain in the human, and they are never able to stand the effects of the sun afterwards; so shower the animal with a light spray, and cool off slowly; then he will make a nice recovery, far better than to cool off in a hurry with ice. For internal treatment give stimulants—alcohol is the remedy; you can give $\frac{1}{2}$ pint whisky the first dose, then 2 or 4 oz. doses every few hours. The principle is to cool off and give stimulants. Whisky is better than injections of strychnine or atropine. In autopsy you will find the blood thick, black, and tarry.

POLL EVIL AND FISTULOUS WITHERS.—The cause usually is violence of some sort. Fistula is often caused in the country by one horse catching another with his teeth and holding on till he bruises the withers. Poll Evil is often caused by jamming the head against the ceiling, or tumbling over backwards, etc. In both cases there are pockets formed.

Treatment.—Make a dependent opening where it is possible; don't be afraid to use the knife—free use of the knife and a dependent opening is the secret of success in these cases. Then wash out and treat antiseptically as a simple wound, packing the opening with oakum for drainage; in this way it permits the wound to heal up from the bottom, and keeps the outer opening open till it heals up to it. Often in Fistulous Withers there is necrosed tissue found; sometimes the dorsal spines are affected and must be removed—that is the affected parts. For antiseptic in this treatment, use carbolized oil, 1 to 16 of cotton seed, linseed, or olive oil; and instead of sponging, irrigate the wound, sop out with cotton, then fill up with the carbolized oil and cover over; dress once or twice a day, and don't irrigate too much.

CLIPPING.—Where a horse has light and fast work, a warm stable and blankets, in short, good care, the best thing is to clip him; he comes in wet with perspiration, and as he is hard to clean, he may go out wet again. But the horse that has slow work or is standing much while out, or in cold stables, should not be clipped. The horse that is driven much and sweats, risks going out wet, is predisposed to Pneumonia, Pleurisy, etc., but after he is clipped always give him good bedding, so as to not interfere with the circulation. November is the time horses are usually clipped, except where it is done to avoid the flying of hair when he is shedding, which is the case when clipping is done the last week in March. We have often seen cases where horses have been unthrifty, and medicine failed to help them, that clipping did them good, and

the horses became better in every way and more thrifty.

FISTULA AT THE BASE OF THE EAR.—Cause is not known, but I think it is due to the pressure of the band on the bridle; it forms a pocket from two to three inches deep.

Treatment.—Dissect out, slitting down with a probe-pointed bistoury; then with the forceps draw inside out as you would a glove, dissect out with your scalpel, and treat as a simple wound.

LOCO POISONING.—Is due to the loco weed, which grows on some of our Western plains.

Symptoms.—Horse or cattle gets fits of delirium, mild at first, but they increase until the animal becomes wild and unmanageable; he rears, plunges, and becomes crazy, finally goes down and dies in convulsions.

Treatment.—Only thing to do is to treat rationally; might give whisky and gelsemium mixed, and bromide potash.

BURNS AND FROST BITES.—Are identical; there is the same morbid anatomy in both.

Treatment.—Use oleaginous applications and antiseptics; carron oil, that is lime water and linseed oil mixed, is good, or use carbolized oil, 1 in 16; after covering the surface with the oil then cover with cotton. If it sloughs, dress once a day. In case the skin is destroyed, or when it granulates, don't let the granulation go too far—apply white lotion; begin it a week after the injury. If you get hold of Frost Bite early, draw the frost slowly so as to re-establish the circulation gradually; it gives a better result. In case there is inflammation following, use poultice.

FOOT ROT OR FOUL IN CATTLE.—This usually occurs in low lying grounds; many claim it is infectious, but we think the reason it runs through a herd, is because they are all exposed to the same cause. Black mud (muck) and serated grass are causes, as they make wounds and cause sloughing; or in some cases where the hoofs are not worn, due to soft ground, they grow and curl in like ram's horns and the mud gets in there. This is never seen in hilly countries.

Treatment.—Pare off the hoof, clean, and use iodoform, burnt alum, or boracic acid, then treat antiseptically. Williams says as a last resort to amputate the foot.

SNAKE BITES.—Symptoms, part swells, and according to the venom of the snake, the person or animal will in time become delirious, insensible, and die from blood poisoning in a comatose condition.

Treatment.—Give whisky, freely; for horse, $\frac{1}{2}$ pint every two hours, and pack the bitten part with aqua solution of ammonia, not quite strong enough to cauterize.

DROOPING EARS.—Is where the top of the ear droops over, usually from frost bite while a colt or foal, the part not yet being dry. It is an eye sore, and is easily remedied.

Treatment.—Raise the flap, make an incision on the under side, straight across through the skin and about $\frac{2}{3}$ through the cartilage, straighten the ear, put on dry iodoform or boracic acid, then put on two splints, one on each side, straight up and down, and sew through the whole thing with silver wire. Watch it, and if it suppurates, wash out with cold water and dust with dry dressing; granulation fills up the cut and straightens the ear.

SPLIT EAR.—Make fresh edges on both sides, cutting off about $\frac{1}{4}$ inch; put on the same kind of splints as above, then sew the edges of the cut together, and treat with dry dressing.

BITTEN EARS.—Trim both to suit appearances.

FINIS.

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