

and when the animal is put to severe exertion, circulation and respiration being increased, it induces a rapid oxidation of the super-abundant albumen, with the result that it becomes converted into uric and hippuric acid. The kidneys being unable to excrete them, they give rise to the symptoms manifested in the disease. I do not wish to contradict such authority as Prof. Williams, but he does not show us that he finds excess of the uric and hippuric acids in the urine or blood; and of the chemical analysis that I have had an opportunity of reading none of them show an increase in the acids above what might be normally expected in animals fed in the same way as those affected, but they all do show a decided increase in the amount of urea.

Prof. Peters, in giving the chemical composition of urine, said that in twenty-four hours eight and a-half pints of fluid was secreted. Of this amount five ounces were solids or organic matters, urea alone forming three and three-quarter ounces. He also gave us the formation of urea; it was all the waste proteids and excess of nitrogenous food and metabolism of nitrogenous tissues of the body. He also stated that practically there was little or no uric or hippuric acid seen in the urine, except in colts and starving animals. In cases where the urine became acid, it was due to acid sodium phosphate and not due to the acids before mentioned.

So, taking as authority our present teachers, and we believe them to be second to none on this continent or on any other, as far as veterinary colleges are concerned, also Prof. Williams being unable to show excess in sufficient quantity of the acids he gives as being the causes of the symptoms, we must look at the cause from our present knowledge as urea in excess, this being caused by the enforced rest and stimulating diet, especially if the animal be in a plethoric condition. The system during this state of quietude requires a much less amount of nutritious material, the extra amount being converted into urea. We must now account for the disease manifesting itself most frequently upon violent exertion, although it is not absolutely necessary for exercise to produce the disease, as it occurs during rest. Upon the animal being put to exertion, circulation and respiration are increased. Tissue metamorphoses is increased, throwing its waste products into the already impure blood, with the result that the blood becomes so loaded with impurities that it is unable to perform its functions in carrying oxygen to the different tissues of the body, with the result that the blood so affected poisons the tissues, especially the nerves, giving rise to the characteristic symptoms of the disease. The kidneys at this time endeavor to get rid of the effete material, but it being in such an excessive amount, they are unable to excrete it; if they were able no symptoms would be manifested.

Prof. Robertson, in describing this disease, says it is a complex morbid condition or assemblage of symptoms, the most characteristic features of which are certain musculo-nervous phenomena, particularly clonic or tonic spasms and paralysis of the muscles of the posterior part of the trunk and limbs, and the discharge of a dark colored urine containing considerable quantities of Hæmoglobin; but in his analysis of the urine he fails to give Hæmoglobin as one of its constituents; also that in looking over the different analyses, I did not find any of them mention Hæmoglobin as being found in the urine of animals suffering from Azoturia.

It has been given by various authorities that this disease affects mares only, and during the period of oestrus, but such is not the case, as the disease affects both the gelding and stallion; and, according to some of our authorities, is more difficult to treat, and, if occurring in an entire horse, is nearly always fatal. As to it occurring at the period of oestrus only is wrong, although it may be noticed more in mares at that time. Owing to the intense excitement during that period rendering them unpleasant and perhaps unfit for work, they are left in the stable and subjected to the exciting causes of the disease, this probably being the reason of the assertion. It has also been noticed in pregnant mares, so the period of oestrus could have nothing to do with it in such cases.

CAUSE.

It is not necessary to waste much time upon the causes, as they have already been mentioned, the principal being enforced rest and stimulating diet, perhaps assisted by functional inactivity of the different excretory channels of the body. Prof. Robertson says horses fed on over ripe tares are more predisposed than animals fed on other descriptions of food.

SYMPTOMS.

Those noticed are often of an extremely sudden and urgent character; the attendant has noticed no warning or premonitory symptoms of either disturbed digestion or innervation, the animal immediately preceding the attack being regarded as in the very best of health and spirits. Advancing knowledge of the true pathology of the condition suggests that certain changes are recognizable previous to the more urgent, but, from the usual amount of disturbance, it is overlooked, although it often occurs upon exertion; it may also occur while standing in the stable, and give rise to certain symptoms which may tend to mislead, but if the practitioner is careful and observant the true character of the disease soon manifests itself. At first the animal may evince considerable pain and uneasiness, sweats profusely, stamps, more or less twitching of the muscles, but does not attempt to lie down, although it appears as if it would like to,

pulse full and bounding or quick and weak, temperature increased, and, as the disease advances, the animal will begin to sway sideways or exhibit signs of falling; these symptoms may continue, and finally the animal loses control of himself and falls. The urine, if drawn off, will be symptomatic of Azoturia.

On the other hand, the animal taken from the stable is quite gay and gives every appearance of being able to stand a severe test or hard journey, but may only go a few hundred rods, or may go miles, when he suddenly gets stiff, then lame, great difficulty in moving the limb or limbs, usually the hind ones, but it may affect the fore ones; it is with difficulty he is moved along at all, and finally falls, losing all power of the hind extremities, the pulse is increased in frequency and temperature is elevated; partial sweats may be present; the urine if examined will exhibit the well-marked changes; the muscles of the back and loins, also the gluteal muscles, in a state of rigid contraction. The animal may now show symptoms of brain lesions, first restlessness and attempts to rise, and finally coma and death.

Many of these very sudden attacks, unless we think of the possible occurrence of this disease and know the history of the case, might at first be mistaken for some lesion of the spine or muscles of the loins and back. It is also quite possible for a horse standing in the stable for a few days to become affected with colic; the exertion caused by the pain may be quite sufficient to induce the appearance of this disease, hence the importance of, in treating any case, to keep a sharp look out for complications or terminations.

The terminations of this disease are somewhat varied. Cases which resemble each other in the commencement may have a very different course and termination. For instance, one case may appear as if struck with apoplexy, struggle violently for a few hours, become comatose and die. Others, after the abatement of the more severe symptoms, make no further progress, may be perfectly conscious, have a fair appetite, but never regain the use of their limbs, and either remain down until destroyed or carried off by some other disease. Others, under proper treatment, the urine regains its natural condition, the muscular spasms are relieved, motor power is restored, and the animal finally recovers.

TREATMENT.

In those cases where the loss of muscular power is so great and so suddenly developed that the animal is unable to move or maintain the standing posture, the prognosis is unfavorable; but where the animal is able to stand or exert any movement whatever, such cases are attended with success.

The animal should be placed in a stall, it being preferable to a box in this case, all of which should be done quietly and not excite the animal, as excitement tends to aggravate the symptoms; the catheter should be passed and the urine drawn off, which will be of a coffee color, and should be repeated every two or three hours; the other excretory organs should be stimulated into action by purgatives and diaphoretics, a ball composed of aloes perhaps being the best, perspiration being induced by warm clothing and medicines. Tonics and antiseptics are to be recommended to ward off the result of the uranic poisoning, the different preparations of soda being advisable, possessing diuretic and antiseptic properties. Quinine has also been recommended; spirits of nitre, etc., possessing stimulant and diuretic actions, is useful; iron is to be given as a tonic. When after three or four days and the more acute symptoms have passed off, and the animal still unable to rise, slings may be advisable, also friction to the muscles, and the use of nuxvomica may be tried. During convalescence great care must be exercised in feeding, so as not to disturb the digestive organs, also the injudicious use of medicines to restore the healthy action of the entire system.

POST MORTEM APPEARANCES.

Blood darker than usual and containing pigment granules. Rigor mortis, if at all, is very sudden, and lasts but for a short time. The affected muscles are sodden with apparently effused or dissolved dusky material, lighter in color, and on microscopic examination exhibit irregular striation and degenerative changes; kidneys generally dark in color and congested; epithelium of tubes often absent or swollen. Hemorrhages in various parts have been noticed: the serious membranes and viscera sometimes show small blood markings; bladder partakes of similar changes, but, if containing urine, is coffee-colored and of a nature as follows: The very obvious changes which the urinary secretion has undergone has constituted it a diagnostic feature, so much so as to have warranted the founding upon this peculiar condition the name by which this generally disordered state is recognized. The urine must be examined as soon as possible after it is obtained from the animal, as it quickly becomes ammoniacal; in every case its specific gravity is increased. It is coffee-colored and of an ammoniacal odor. Boiled, it gives no reaction, except liberating ammonia gas; treated with nitric acid it becomes solid almost, the solidity being due to the preparation of the crystals of the nitrate of urea. At first the addition of acids causes much effervescence, the urine being strongly alkaline, containing carbonate of ammonia. Crystals of the nitrate of urea may be seen in the serum of the blood.



THE QUIET HOUR.

"Take Heart of Grace."

Hast thou not seen how, for some precious treasure,
Men beat of purest gold, a goodly case?
Or cut for fragrant odours, at their pleasure,
Out of rough stone, a rare and polish'd vase?
O thou short-sighted one, take heart of grace.
Like them, when for myself I am preparing,
Out of the soul, a fit abiding-place;
I hew thee, beat thee, till I see thee bearing
My image; and my perfect likeness trace;
Therefore, thou chosen one, take heart of grace.
Oh, then, be of good courage! for I love thee;
Gladly and cheerfully each cross embrace,
And bear it manfully; for soon above thee,
Light from my throne each cloud away shall chase;
Therefore, afflicted one, take heart of grace.
And soon life's sorest trials past forever,
Faultless before my Father's face,
I will present thee joyfully; and never
Need to say to thee in that resting place,
O weary fainting soul, take heart of grace.

For Reading to the Sick.

SHAPING THE STONES.

Most of us have been into a stonemason's workshop and seen stones of every shape and description lying about, some rough, just as they came from the quarry, others squared, smooth, and even, fit for the builder's hand. Now these latter did not become so of themselves, a great deal of time and labor had been spent upon them, and a great number of sharp tools had been used to bring them into proper order. We can all see the necessity and propriety of this, so we will study it as being a figure of God's dealings with us. St. Peter tell us that Christians are "living stones," built by God into the spiritual house of which Jesus Christ is "the chief corner-stone." But to make us "living stones" our Heavenly Father takes us out from the quarry, that is the world, and puts us into His workshop, the church, from which He chooses those best fitted to be built into His spiritual temple. We therefore are naturally no more fit to be used in such a glorious work than are the stones just taken from the quarry ready for building; but we have been selected, cut out, severed, and brought away to be prepared. It is not for any goodness of our own, but the Father's free mercy and love through the Son, which has brought us into a state of salvation. God has chosen us, and as we are but clumsy, ill-shaped fragments, we must be wrought upon and prepared, we must be shaped and fashioned anew, our rough tempers polished off so that we may not disfigure the building.

Sometimes the Master Mason smites sharply with the hammer of anguish and pain, at others with the cold chisel of sorrow and affliction, till our hard stony hearts take the form which God wills. Shall we blindly fret at these gracious dealings and willfully choose rather to be cast on one side as unprofitable stones, than thus to be the subject of a chastening, purifying love? No, a thousand times no. Let the great Architect be busy with us, even though the work be painful and grievous, for the more we suffer the fitter we shall be for a place of honor and usefulness in his temple. Which is the fairest stone in a beautiful church? That which has been longest under the carver's hand, that which has been patiently wrought on with many a sharp biting tool, hollowed out here, shaped away there, till it has become the crowning beauty of the whole. We may rest in hope that we are being perfected in varied Christian graces by our sharp sufferings and stern chastisements, till we are the choicest work of the great Master Mason's hand. "Long and painful sickness," says a pious writer, "is often blest to the attainment of such patience and humility and meekness and thankfulness as is rarely won by those in health." Of such it may be said,

"Many a blow and biting sculpture,
Polished well those stones elect."

Then never murmur at the dealings of God, even if His hand presses heavily on us. We will rather say, "As Thou wilt, O my Father, only let my sickness be to thy glory." If Jesus, "the chief corner-stone," was made perfect through suffering, the stone that is shaped and moulded by suffering is most fit to be placed near Him.

"We Glory in Tribulation Also."

Within this leaf, to every eye
So little worth, doth hidden lie
Most rare and subtle fragrance.
Wouldst thou its secret strength unbind?
Crush it, and thou shalt perfume find
Sweet as Arabia's spicy wind.
In this dull stone so poor and bare
Of shape or lustre, patient care
Will find for thee a jewel rare!
But first must skillful hands essay
With file and flint, to clear away
The film which hides its fire from day.
This leaf! this stone! it is thy heart;
It must be crushed by pain and smart;
It must be cleansed by sorrow's art,
Till it will yield a fragrance sweet,
Till it will shine a jewel meet
To lay before thy dear Lord's feet.