

ART. IV. *Observations on the Crusta Genu Equinæ, (Sweat or Knee Seab, Mock or Encircled Hoof, Knees, Hangers, Dew Claws, Night Eyes, or Horse Crust,) in Epilepsy.* By JOHN S. METTAUER, M. D. of Prince Edward County, Virginia.

IN communicating to the medical public our experience with a new medicinal agent, the wish to abridge human suffering in a most afflictive disease, and not to swell the catalogue of remedies, already too extensive, has been the governing motive.

We do not appear before our brethren as *innovators*, but as fellow labourers; tendering to the common stock the fruits of our little experience with an article, which, although confessedly new to most of the profession, has, nevertheless, been long and familiarly known to us.

The grounds upon which this new agent rest, for at least a favourable consideration of its claims upon the profession are, its successful employment in the cure of some forty or fifty well-marked cases of epilepsy.

The substance designated by the several appellations at the head of this article, is furnished by the horse; four oval surfaces, situated on the inner aspects of the extremities, near the knees, are the parts of the animal from which it is obtained. The secretion is poured out so gradually, and in such small quantities at a time, as not to be observed in its fluid, or even semi-fluid states. The crust is of variable colour, as well as density; its exterior is always of a lighter appearance, and harder than the interior, which is dark and soft; it is of a lamellated and fibrous texture, and when broken, resembles dark, soft horn; its odour is very penetrating, diffusible, and peculiar; it is deciduous, and separates gradually two or three times during the year; when prematurely or forcibly removed, the surface from which it is taken, sometimes bleeds a little, inflames, and becomes tender and sore.

Our investigations in relation to the peculiar function of the surfaces, or the offices they subserve in the economy of the animals themselves, do not enable us to say much, if any thing on this subject. Nothing certain seem yet to have been ascertained as to their uses. Conjecture and an extremely vague and loose tradition, afford the only explanations. The surfaces have been supposed to separate and eliminate from the system, a fluid possessing many of the constituents of sweat, and loaded besides with properties peculiar to itself, which, if detained, deteriorates the health of the animal. The

constant and regular discharge of this fluid, has been thought necessary for the perfect health of the animal, in promoting a sound state, more especially of the extremities, after-heels, hoofs, and legs, all of which have been supposed to become diseased in some way by obstructions of the surfaces.

Emunctories somewhat similar, exist on the inner surfaces of the extremities of the swine, near the knees, which, if long obstructed, generally result in lameness and dragging of the posterior extremities; a secretion is continually distilling from them, which, like the crust of the horse, displays the peculiar odour or scent of the animal, more particularly observable when surprised or irritated.

As a *medicinal agent*, the crust has been long known in this part of the country. How it found its way into use as a remedy, is not certainly ascertained. It is conjectured that the coincidence of the horse being observed to bite the crust, and to pass worms from the bowels soon after, suggested it as such, and the conjecture is by no means improbable, when it is remembered, that this article was first employed as a vermifuge with that animal. The fœtid odour of the crust, it would seem, might naturally have suggested the idea of its possessing remediate powers, and doubtless did indicate it as a nerve and antispasmodic, after it was supposed to possess vermifuge properties.

We have long known and employed this substance as an antispasmodic; but the merit of introducing it into regular practice, is due to Dr. JOSEPH METTAUER, (the writer's father,) who employed it in epilepsy so early as 1782 or 1783. During the last twenty-five years we have enjoyed many, and satisfactory opportunities of using the crust as a remedy in epileptic convulsions.

In collecting the crust for medical purposes, it is necessary to attend carefully to its loosening tendency from time to time, or it may fall off and be lost. It may be made to separate a little sooner by gentle solicitation, and occasionally by firm compression with a bandage. This should be suffered to remain on after the period of disquamation is near at hand, to prevent the accidental loss of the crust. After it is obtained, it should always be dried a short time in the shade, and then it may be kept for use in a close jar, to prevent, so far as possible, the escape of its volatile properties.

We have to regret our inability to furnish a correct, or even a tolerably satisfactory chemical analysis of the crust; from what has been ascertained, the urate of soda seems to be one of its principal constituents; we are inclined to believe that ammonia, in combination with perhaps the lithic acid, may also enter into its composition;

from the peculiar compound odour which it often inhales, much resembles that emitted by common urine after standing some time.

Two forms for administration are only used—the powder and tincture. When the powder is to be used, it should always be freshly prepared, either by pounding and rubbing the dry crust in a mortar, or by grating it with a common nutmeg grater; this last process will be found, (generally,) most convenient, as it enables the practitioner to reduce it, at once, to a very fine and equable powder, even if the crust is imperfectly dried.

The tincture is prepared by simply digesting the broken or powdered crust in diluted alcohol, or common brandy, exposed to a gentle heat for eight or ten days, in the proportion of one part of the former to four of the latter.

The doses of the powder vary from two to twenty grains; it may be given diffused in any liquid which the patient fancies. With young patients it is safest to begin with the minimum, and increase very gradually to the maximum doses. Should the disease yield before the largest doses are reached, no further augmentation need be made. When the tincture is employed, from $\mathfrak{z}\text{ss}$. to $\mathfrak{z}\text{iss}$. are its extreme doses. Diluted with water and sugar, it may be given with very little difficulty to the youngest subjects, as it is tasteless, and in a great measure inodorous. In this form also, the doses should be very gradually increased, to prevent, as far as possible, the danger of exciting the system too much, which might result from the menstruum, should the doses be suddenly augmented.

Possessing properties perfectly analogous to the crust, and employed with the same intention, and in nearly similar doses and forms, we will mention the parings of the hoof. In some cases it has been thought more efficacious than the crust itself. We have used it frequently in the form of tincture in the proportions of one part hoof to two of spirits, with complete success. A favourable result from the use of this remedy, (which we had prescribed in a case of epilepsy,) has been communicated to us since commencing this essay. Extreme doses, $\mathfrak{z}\text{j}$. to $\mathfrak{z}\text{ij}$.

The administration of the crust should always be preceded by a purgative or aperient. This step is designed to prepare the system for the action of the remedy, which it effects by unloading the intestines of vitiated secretions; increasing at the same time the nervous susceptibility of their mucous membranes to remediate impressions, and by determining from the head.

Aperients, or the milder purgatives, should be employed, and generally preferred in those cases of epilepsy distinguished by slight

aberrations in the animal economy; in such examples the pulse, bowels, and skin are very nearly in the condition of healthy organs; the paroxysms are short and transitory, succeeded by little or no coma, or even drowsiness. In cases marked by symptoms of greater violence, in which a decided inflammatory or congestive character predominates, cathartics should be used; to be varied in activity and strength in proportion as the symptoms partake more or less of acute characters; these are to be repeated until a decided impression is made. Cases of this latter description sometimes require V. S. also, and when this remedy is employed, blood should be always detracted from one or both of the external jugulars, if possible. Occasionally mercurials alone, or in combination with antimonials, are required.

In the first description, or milder cases of epilepsy, some preparations of rhubarb, or rhubarb itself should be preferred. In the more violent cases, a combination of aloes, scammony, and jalap, has generally been found most suitable; of each from two to five grains. Calomel with tart. antim. may be added, should the biliary secretion prove very defective, in proportions of two to four grains of the former, and one-fifth to one-third of a grain of the latter. These are to be repeated daily, or once in two days, until the circulation is balanced, the encephalic congestions in a measure dislodged, and the sympathies restored. These preparatory steps having been premised, the crust may be commenced with.

The form or preparation is to be determined by the peculiarities of constitutions, or the complications which modify the disease. Should the case occur in a constitution displaying a highly wrought sanguineous development, the crust in simple powder will be most applicable, and should be preferred.

It will be safest to begin with the remedy at night, and as soon after the disturbances of the preceding paroxysms have subsided as possible. When given at night for the first time, it is more certainly retained by the stomach, and patients too, are less averse at this period of the day to the taking of an offensive remedy, very probably because the gastric organ is rendered less fastidious by the action of food and drinks upon it during the day.

With young subjects from six to eight years of age, two grains will, in a majority of cases, constitute the commencing dose. We have never used it with patients younger than six years, or older than thirty. Older patients say from eight to twelve, or fifteen years of age, will bear four or five grains, or even larger doses in the commencement, and with such it may be more suddenly increased to the maximum doses, without gastric disturbances. The remedy rarely

offends the stomach when the foregoing precautions are properly attended to; on the contrary, it seems rather to compose and tranquilize this organ. Three doses, in a majority of cases, are as many as will be required in the twenty-four hours. Should cases occur marked by convulsions of unusual violence, with frequent paroxysms, it may be given oftener. From many trials with this article, it has not been perceived that there is much diversity of effect when employed in large or medium doses with young subjects.

Cases requiring the tincture, differ from those already noticed, chiefly on account of the more strongly marked developments, with which they are associated; in such examples of epilepsy, a decided hydropic diathesis not unfrequently obtains; the adipose textures generally, but more especially of the skin, are disposed to bloat a little, with universal pallidness and reduced temperature; the secretions from the skin, bowels, and kidneys, are generally defective; the pulse is occasionally slow, feeble, and soft, but more frequently it is preternaturally active and corded, from the nervous mobility generally attendant upon imperfect sanguification; such patients are nearly always languid and sluggish, and often require diffusible stimuli to rouse the enfeebled energies, both of body and mind, to something like a comfortable state of excitation; with such subjects, the approach of the paroxysm is more gradual, and may, in many instances, be foreseen for hours, and sometimes days. To this complication of epilepsy, the tincture is most happily adapted, as it presents the remedy in the form best calculated to act promptly, as well as to meet the several indications of cure. It should, (as advised with regard to the crust in substance,) always be commenced with at night, and in the minimum doses; from $\overline{3}$ ss. to $\overline{5}$ iiss. may be given, properly diluted, three or four times during the day. Being less permanent in its effects, the tincture should be given more frequently than the crust in substance, especially if the symptoms are urgent; these doses may be repeated with safety as often as once in three or four hours.

Occasionally in this form or complication of epilepsy, it becomes necessary to employ tonics, either mineral or vegetable, or perhaps both, before the tincture, (or powder,) can be given with the least benefit. By invigorating the organic tone, upon which the normal functional actions materially depend, (especially of the digesto-nutritive systems,) our agent is enabled the more effectually to produce its specific remediate excitation. That debility exists in these cases, may be inferred from the general anæmial aspect of such patients, as well as from the marked benefits following the use of tonics. It

is an observation worth remembering, (the truth of which has been often verified in the course of our practice,) that nervines rarely benefit when the organic tone is greatly depressed; like mercurials, they are more certainly remediate, under certain circumstances of energy of the organic vitality; depressed, (or exalted,) inordinately, both fail of their remediate effects.

Should costiveness supervene, (which will be often the case,) a combination of scammony, aloes, and rhubarb is to be used, in doses of from two to four grains of scammony, about the same proportion of aloes, and from four to eight grains of rhubarb, made into pills. This compound should be given at night, and the doses so managed, as to elicit only one or two evacuations, the design not being to purge freely. In restoring the solubility of the bowels, we know of no combination so well suited to such cases as the one just recommended; its action is gentle, but effective, particularly in eliciting the biliary secretion, upon which circumstance the peristaltic movements of the intestines are mainly dependent.

The crust, administered in either of its forms, should be suspended during the employment of aperients or cathartics; and should not be resumed, until, at least, the active cathartic movements subside. To correct the acidity which is occasionally present in this form of epilepsy, it has been found necessary to employ alkaline absorbents; and for this purpose a weak lixivium of hickory, or grape-wine ashes, has seemed to answer best: it should be prepared by mixing one heaping table-spoonful of the ashes in a quart of water; of the clear liquid, from $\frac{3}{4}$ ss. $\frac{3}{4}$ j. may be taken two or three times daily, after eating, or as often as may be found necessary, without irritating the bowels, which it will sometimes do if continued too long.

In both modifications of the disease, the diet should be particularly attended to during the whole course of the treatment, and indeed for some time after the cure may be supposed to have been effected. In the sanguineous variety it should be decidedly abstemious; animal or oily substances are to be inhibited; cooked farinaceous articles; some of the soft pulpy fruits; molasses; and occasionally, thin animal broths will be found most suitable; very little food of any kind should be taken into the stomach after 2 o'clock, P. M. The epileptic patient should always retire to bed with the stomach nearly empty.

In the lymphatic complication, some latitude in diet may be allowed; that is, animal substances, moderately coagulated, and of a purely muscular character, may, (after the bowels are *regulated*,) be used in small quantities; should acidity abound, or a tendency to it

in the stomach be discovered, the use of animal food is not only allowable, but particularly applicable.

As auxiliary means in the cure, the earliest attention should be given to uniformity of temperature; the skin should be well protected against the unequal action of cold, during every stage of the treatment; and for this purpose, the wearing of flannel next the skin should be directed. Thus protected, under all circumstances of climate and exposure, the individual may, (as it is requisite he should do,) indulge in moderate exercise, and even pursue many of his ordinary avocations, with comparative safety. This suggestion will not be regarded as supererogatory, when it is recollected, that epileptic attacks often originate in a want or neglect of comfortable clothing; and every practitioner much conversant with the disease must have witnessed relapses from exposure to the causes of catarrh.

The remedy which we have been considering should be discontinued or suspended upon the accession, and during the continuance of any new or acute diseases; and when resumed should be commenced within medium doses.

Employed in either of its forms, the crust should be continued perseveringly, until a cure is effected, or a satisfactory trial of its powers has been made. In no disease, which "flesh is heir to," is it more important to inculcate patience during treatment than epilepsy, and the failures of medical practitioners in contending with it, are to be attributed to the disregard of this admonition, rather than to the incurable nature of the disease; we might mention also, a want of confidence in remedies, among medical men, as an obstacle in the way of satisfactory trials. In every successful case our remedy should be continued sometime after the convulsions have ceased to return; the patient cannot be considered cured until the general health too is restored, even if the convulsions have long subsided.

It is not pretended that the crust will prove remediate in every case of epilepsy, nor even in all such examples as are idiopathic; some of these may be so strongly engrafted upon the system, from long continuance of the disease, as to have become completely constitutional and fixed, and necessarily irremediable. In the case connected with organic lesions of the skull or brain, (could they possibly be distinguished,) we should never advise the crust; but as it must be confessed that such cases cannot be discriminated, it will be safest in every instance to give the remedy a fair trial, (more especially as it is not likely to aggravate the incurable cases,) and such has uniformly been our custom.

In obstinate cases the crust should be continued for more than a

year before it is to be discarded, or the case abandoned as incurable; both forms should always be employed and used alternately.

The crust in form of tincture is also a valuable nervine and antispasmodic in hysteric convulsions, and indeed in hysteria generally. In that variety, connected with or proceeding from uterine irregularities incident to sterile married, (or unmarried,) females, it will be particularly serviceable; with such the paroxysms must strikingly resemble epilepsy.

The singular efficacy of the crust in the treatment of epilepsy, its mild and peculiar qualities taken in connexion with the violent characters of the disease, have suggested the following pathological views and rationale of the action of the crust.

Epilepsy originates generally in infancy, and is to be esteemed rather a state of quiescent, than active disease, in which all the essential properties exist, the convulsions only marking that stage which should be regarded as its most active, or the spasmodic stage.

In the quiescent, as well as the actively spasmodic stages, irritation seems to obtain, and doubtless constitutes the pathological condition of the textures involved; it is not only the primary pathological condition of the tissue, but exists in different degrees in every stage of epilepsy, from the quiescent to the convulsive, and it is from this also that the morbid susceptibility results; it originates primarily in, and is chiefly confined to, the sentient extremities of the gastro-intestinal and encephalic nerves, in their motory relations with the muscles; it may result from, or be connected with, certain congenital organizations, peculiar to large heads, with or without precocity of intellect; or gastro-intestinal irritation, from the presence of worms, crudities, &c. or from dentition, or possibly all may be present and necessary to complete the epileptic liability. That a remarkable irritative excitability of mind and body, can be distinguished in a large majority of epileptics, both before and after the convulsions, will be conceded by all who are conversant with the disease. This irritation may also be the cause of those extraordinary developments of the brain and intellectual faculties in infancy and childhood. Once impressed, it is kept up and perpetuated by the numerous and diversified irritating causes incessantly acting upon infantile systems, and occurring while the textures are unfolding and organizing their respective vitalities; it may in some degree become incorporated with the structures themselves, as one of their properties.

Instituted in either of the nervous extremities, the irritation, (or convulsive susceptibility,) is extended to the other, thus completing the epileptic liability, or the passive stage of the disease. Why the

irritation of the passive stage invites, and subjects the system to active spasmodic movements, cannot be satisfactorily explained, unless we are permitted to suppose that the peculiar or motive nervous tissue in which it originates, and the excitation from which it seems to result, may impart to it this character or tendency. Originating in the nerves, the convulsive movements are extended to the muscles by the operation of new or irritating causes.

The epileptic susceptibility in a majority of cases, is first to be traced in the nerves of the gastro-intestinal mucous membranes; and is manifested by the early and frequent production of convulsions from ingesta, crudities, worms, &c.

As the intellectual organizations become more fully developed, the susceptibility may also be perceived in them, and now it is, that mental and moral causes may become the instruments of epileptic convulsions.

According to the foregoing views, epilepsy consists of two stages, the passive, (or what has generally been regarded the predisposing,) and the active, or convulsive stages; they differ only in the degree of violence and extent of the irritation, which is to be regarded as a unit. In the passive stage, the irritation seems to be confined chiefly to the sentient extremity, while the intermediate prolongations of the nerves are only invaded by a less degree, or the predisposing irritation; in the convulsive, all the organs and textures usually involved are equally irritated and excited. "Convulsions are not the disease, they are only symptoms of disease." In epilepsy they are not to be regarded as the disease itself, but the convulsive stage of it.

From the numerous post obit reports of cerebral lesions, and morbid appearances connected with epilepsy, it is not by any means established that the disease results from such local affections. ESQUIROL himself, although enjoying the most favourable opportunities for investigating the subject, has not been willing to refer the disease to an appreciable or definite cause, or to deduce the pathological conditions of the structures from the records of morbid anatomy. Lesions without epilepsy, similar to those met with in epileptic bodies, have been discovered in the brain, according to the researches and reports of WEPFER and LOREY, from which it may fairly be inferred that they are not invariable concomitants, as cause and effect. Such lesions are to be regarded "rather as the consequences of epilepsy than its causes." Our conviction is, that convulsive irritation of the sentient extremities, as well as the intermediate prolongations of the gastro-intestinal and encephalic nerves in their motive relations, generally induced by the action of occasional irritants upon the fan- tile

constitution, is the essential pathological condition upon which epilepsy depends, in a very large majority, if not in all of the cases.

The action of the crust in arresting and curing epileptic irritation, doubtless commences in the sentient extremities of the nerves of the gastro-intestinal mucous membranes: the remediate excitation it induces, differs essentially from irritation; it is the action of a nervine stimulant, exciting the irritated organism equally and pleasantly; the remedy may be regarded as a nervine roborant; the action is also antispasmodic, and approximates in its nature to the movements of health; and if the remedy be continued, it generally becomes the predominant excitation; being the predominant action in the sentient extremities of the gastro-intestinal nerves, the brain is soon brought into sympathy, which reflecting back upon these textures, a corresponding action not only fixes it in them as determined and established, but also in every other similar texture. In this, as in all other cases of remediate medication, the action begins in the part to which the agent is first applied, and the brain reflecting it back upon the organs first excited, or such others as may stand more particularly related to it, by natural or acquired sympathetic ties, determines and fixes the location of it. The primary excitations and the textures, whether in the establishment of diseased, remediate, or healthy actions, determine their character, while the brain fixes their locations. Morbid excitations do not always continue in their primary seats, but are directed and determined occasionally by the brain to other parts which chance to be more strongly predisposed, and consequently more intimately connected with, and influenced by it. Remediate impressions are also liable to a similar transfer, and cases have occurred in which such excitations have been determined and translated to the primary seats of irritation, greatly to the aggravation of the disease.

The action thus set up by the operation of the crust, and continued by reapplications of the remedy, becomes more and more firmly fixed and established by the associations which it is continually and progressively forming in the system; at length becoming predominant, it merges, or is lost in the actions of health. In this way we would explain the operation of remedies generally; when failures result, remediate agents either, have not been appropriately selected, or regularly and faithfully employed, or the primary irritation has been of such a violent nature, or so firmly engrafted in the textures and organs, as to be immoveable, and consequently irremediable, under any system or course of medication.

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