Cerebro spinal meningitis / by D.G. Thomas.

6. Cerebro Spinal Meningitis. By Dr. D. G. Thomas, of Utica. Communicated by the Medical Society of Oneida, and read by Dr. C. B. Coventry.

It became my duty early last May, to prepare an article for the Utica City Medical Club, on pathology. Circumstances, which need not now be mentioned, turned my attention to the lesions produced by a disease which, since the warm weather of February, had prevailed with a fearful ratio of mortality in central and western New-York. Every step taken in the progress of my investigations imparted new interest, as one after another of the peculiar and important features of this deadly malady were examined. Thinking I might add to our zeal, and the improvement of time for the few hours we should have at our annual meeting, I have enlarged the original article so as to embrace the history, causes, seat, symptoms, treatment, and pathological anatomy of cerebro spinal meningitis.

So far as is now known, it is a disease of a comparatively new advent in medical history. Inflammation of the meninges of the brain has been for centuries investigated by able and competent men; while those of the spinal cord have until recently been comparatively neglected. To increase the difficulties of our investigations over the isolated cases which occasionally occur in the latter, from the accidents or common exposures of life, we have in this a disease often of a decidedly epidemic character. It is very difficult to gather from the scattered records of its visitations sufficient materials for a correct history of its course, and the order in which it broke out and disappeared in different countries and localities. It appeared in various garrisons in France in 1837, and continued until 1842. In 1838 it prevailed in Lamollé and Leipsic; in 1839 in Versailles, Avignon and Strasbourg. It was epidemic in Gibraltar in 1844, and was not confined to the garrison, but prevailed extensively among the

civil population. In 1846–7, it prevailed in England and Ireland. In March, 1848, it was epidemic in Alabama, Missouri and Arkansas. About the same time it suddenly broke out in Sutton and Millbury, Massachusetts; and in several localities in central New-York in 1850–51. It made its appearance in Elmira, N. Y., during the warm weather of February, 1857, and prevailed during the two succeeding months extensively in the western and central parts of the State.

Wherever it has prevailed in an epidemic form, it has been evident that an agent of uncommon power was sapping the fountains of life. Its usual ratio of mortality has been from seventy to eighty per cent. It is true that in some places the ratio has been less than seventy, while in other localities the mortality has been more than eighty per cent. The first nineteen cases, treated in Sutton, Massachusetts, all died; thirteen cases in the French garrison at Doesia all died, and in the epidemic in Boon county, Missouri, five-sixths died.

That it has its origin from malarious exhalations the following opinions and circumstances seem conclusive: M. Gausaud, who had an extensive field for observation, attributes the epidemic in France to this cause. A report was made before the Academy of Medicine in Paris, by Dr. Gautliea, of the disease as it appeared in the military hospitals, in which he considers it analogous in character with typhoid affections and malignant fevers, depending on a degraded condition of the blood, as proved by the various lesions of the serous, and pasenchymatous structures which so rapidly occur. Its ravages continued in Alabama during wet weather, when there was an unusual degree of moisture in the atmosphere, the wind most of this time in the southwest. In the spring of 1844 the Missouri river overflowed a large section in the county of Boon, depositing a layer of sand over a large growth of vegetable matter. During the next three years this section, covered with the deposit, was unusually healthy, while beyond its limits it was sickly. In 1848 this disease appeared with fearful malignancy, but confined entirely to the country covered with the deposit from the river. In Alabama two hundred and forty cases occurred in low moist locali-

ties to ten on the slopes and tops of hills. It broke out in Elmira during the warm weather of last February. The place has no sewerage, and the surface water and filth was exposed to an unusual high temperature for the season. It appeared almost simultaneously in most of the villages and cities of the State west of Utica. It has almost invariably prevailed during the damp weather of March and April, or a warm February, but few cases occurring after the first of May, and appearing again in the month of November and a warm wet December.

The arachnoid membrane and pia matur of the spinal chord, and medulla oblongata, are involved in this affection, and usually the first to suffer. The arachnoid and pia mater cover the brain —the latter casts its folds between its convolutions, lines its ventricles, and both becoming more dense and firm as the ascent to the base of the brain, furnish supporting sheaths to the various nerves that emerge from the cranium. As they descend through the occipital foramen, they still continue to increase in strength, furnishing the mellulla spinalis with the same physiological relations they had done to the brain, and supplying its nerves with a similar supporting sheath. These membranes, like the other serous membranes of the body, are liable to a rapid extension of inflammation, both from their structure and from continuous sympathy; and this, like all diseases where there is loss of serum from an extensive surface, runs rapidly into a state of fatal collapse. If we take into consideration the delicate structure which is involved in this disease, and that its first morbid impression is generally made at the base of the brain, the medulla oblongata and cervical medulla at the origin of the nerves of organic life, it will be easy to understand its rapid course and fatal character.

Its mode of attack is not uniform. In some cases, its approach is accompanied by some disturbance of the stomach and bowels, as slight nausea and vomiting, and moderate diarrhœa. This state is accompanied with slight chills and pain in the head and back, sometimes very severe. After a short time, perhaps a few hours, these slight disturbances of the system will be followed by delirium, an anxious countenance, great restlessness, cool or

cold skin, and a frequent *irregular* pulse. As the disease progresses their muscles become affected with spasmodic contractions, and especially those of the back and neck, which often assume a permanent rigidity, confining the body or neck to one position for days, and sometimes even weeks. The above is one of its modes of attack; but, in the strongly marked congestive form, the irregular pulse, the cold surface, and coma more or less profound usher in the disease. In the course of a few hours, re-action becomes established, the pulse becomes frequent and strong, and not unfrequently retains its irregular action; the skin hot and dry, urgent thirst, severe pain in the head and back, local and general spasms, torpid bowels, irritable stomach, ejecting green morbid secretions, delirium, head drawn to one side, or fixed firmly backward, petechia, and an irritable and excessively tender surface. The morbid condition of the tongue varies with the progress of the disease; in the early stages being slightly covered with a white, or yellow brown fur, and later in the disease, dry and red, or a dark brown coat is found to cover it.

In the congestive form of the disease, if reaction is established, it seems to run a course similar to the milder form of its accession; but during its epidemic character, reaction cannot always be established, the patient sinks rapidly, and in two or three, or at most a few hours death closes the scene. Dr. Ames, in describing the epidemic as it appeared in Alabama, makes two divisions, the congestive and the inflammatory, and each of these he divides into the mild and malignant. It does not seem necessary to enter into a detail of the symptoms of each of these modifications. It will be easy for every intelligent medical gentleman to trace the various conditions of the system in each modification referred to by Dr. Ames. By far the most important point is, to establish the few special symptoms which would lead to a correct diagnosis early in each case. During its prevalence as an epidemic the number of attacks would easily tend to fix its character; but in isolated cases it might not be easy to do so until after a few hours or days, when the irregular pulse and respiration, spasms, tonic contraction of the muscles of the neck

and spine, petechia, and tender surface, would become infallible signs of its presence.

In this affection, two pathological conditions seem to require a brief notice, the one which ushers in the disease, and the other the effect of diseased action after the inflammatory stage has supervened. As we can derive but little aid from a knowledge of the various remedies that have been used in its treatment, the two conditions just noticed with its epidemic character and morbid anatomy, will serve to guide us to a just application of the best means to meet the different indications which become developed during its progress. All diseases that prevail in an epidemic form have a low type of vital power. In such cases, although we may have inflammation follow its more active, and even its severe congestive form of attack in the serous membranes of the spinal cord and brain, in the treatment we must never lose sight of these modifications. Its being epidemic, of malarious origin, and congestive, will not require active depletion.

In the congestive stage, the application of heat, sinapisms, when there is sufficient activity of the capillaries to insure irritation of the skin, and stimulants should be persevered in until reaction or death takes place. Opium, in such quantities as to secure its stimulating effects, should be used. In the progress of the disease we have inflammation developed in the delicate serous membranes of the nervous centers, in which effusion of serum, lymph and pus will be rapidly produced, if its progress is not arrested. In some places where the reaction has been quite severe, general and local bleedings have been found useful; but in a decidedly malarious region, or in a large city, I should not think either ever required. Calomel has undoubtedly more control over congestive inflammation of serious membranes, in preventing effusion, than any known remedy, when properly administered. The quantity and form in which it will be likely to prove most beneficial, will depend upon a number of conditions present in individual cases. By these several indications to be fulfilled, the mode and combinations of the remedy can be readily adjusted. At Avignon and Strasbourg, opium in large doses was found a valuable remedy. It is easy for us

to conceive of conditions when it should not be given. If under its use the pupils are contracted, and the excitement is not relieved, it should be exchanged for the pure extract of cicuta, if the pain and restlessness require an anodyne. Linapisms to the neck and extremities, croton oil and blisters, will become valuable auxiliaries; and in cases of sufficient excitement, cupping and leaching may be used. We might be justly led to infer, from its malarious character, that quinine would be a remedy on which we might rely with confidence, although the disease does not usually assume a periodic character. In Alabama, Missouri and Arkansas, where it often showed remissions, and sometimes complete intermissions, it seemed to have no control over the disease. Last year, in Elmira and Watertown, quinine was used with decided benefit. It will be obvious that a disease presenting such a diversity of conditions, and so extremely rapid in its progress, and fatal, could only be skilfully managed by meeting the indications which usher it into being, or are developed during its course.

The post-mortem examinations in all the localities where it has prevailed, show great similarity. The serous membranes of the spinal cord and brain are more or less congested, and effusions of serum, of coagulated lymph, and if the inflammation has had time to pass through its different stages, sero-purulent matter and pus—a layer of plastic purulent matter covering the whole inner surface of the pia mater, of the brain, and collections of the same about the base of the brain, the pons nasali, and the medulla oblongata. Beneath the spinal arachnoid is found the same kind of purulent matter, and often pus is found opposite the third and last dorsal vertebræ. The spinal marrow, cerebellum and cerebrum, have sometimes been found softened, but they are not usually affected; when they are, the disease assumes a remittent or an intermittent form. In the epidemic which prevailed in Algeria, in 1845, pus was often found in subjects who had died twenty-one hours after the attack. If we consider that pus is never the first, and often the third product of inflamed serous tissue, its rapid production in these cases is proof of its malignant character. Several of the cases

in Elmira terminated within four hours, but as no autopsey could be obtained of them, we are left to conjecture the morbid conditions produced.

This disease has several peculiar and interesting features. According to A. Grissolle, when epidemic in France, its subjects were from three to four males to one female. Dr. Mayene says that in Ireland it was confined almost entirely to boys, and those under twelve years of age. Although in some localities it has seized individuals without regard to age or sex, yet its whole history has shown that males were much the most liable to be attacked, and those not over thirty years old. Its attacks, when it is epidemic, usually occur in the afternoon or evening, before twelve at night. It has also been observed, that even in cases prolonged to several weeks, but little emaciation takes place. It is probable that the loss of flesh is not as rapid in this disease as in several forms of fever, but from my own observation, I think that cases protracted to several weeks become very much wasted.

The real difference between this disease and arachnites, as it usually occurs, from the predispositions of the individual and the irregularities of life, is an interesting question to examine. In the first place, this is of malarious origin. It is true that the severe and destructive inflammation would not be expected to follow the ordinary types of malarious fever, which we find in these cases. But if we refer to the structure assailed, and its epidemic character, we shall have no difficulty in finding the cause of this peculiar feature.

In the second place, the ordinary attacks of arachnities, are primarily seated in the membranes of the cerebrum, and if those of the base of the brain and cord are involved, it is by extension of inflamation. But in these cases, the first and strong impression is made on the membranes of the spinal cord, medalla oblongata, and base of the brain. Here the nerves of organic life have their origin, and their delicate covering and support is at once assailed by a most destructive inflammatory disease, cutting off at their sources every element necessary to carry on the vital agencies of a living being.

In the third place, they differ by a strong tendency in this, to run rapidly through the successive stages of inflamed serous membranes to suppuration; as has been shown, leaving a deposit of pus in the short space of twenty-one hours.

In the fourth place, they differ from the great rigidity of the muscles of the spine and neck, often confining the head for days in one fixed position, sometimes drawing it directly backward, at other times to either side.

Another difference might be called the fifth, is the great sensibility of the surface of the body, showing its relations with the organic nerves, especially those of sensation.

It seems only necessary to refer to the remaining sign of their difference, in the petechial eruption which in this affection has become a distinguishing mark.

I have thus, gentlemen, although in an imperfect manner, fulfilled the object proposed in the examination of this disease. I have availed myself of every material source of information within my reach, and deeply regret that more has not been published in an accessible form, to aid us in meeting the many indications which are ever present with this fearful malady. It is greatly to be feared, that with our present knowledge, when it has its seat in the nervous centers and surrounding parts, which give origin to the nerves of organic life, every resource of medical science will be unavailing. On the other hand, when those parts are not primarily affected, but become so only by an extension of the disease, an opportunity is given for the use of means to arrest the diseased action before fatal lesions are produced.