

rickety, and in whom dentition is delayed. Excitable and nervous children are prone to the disorder. This irritable state of brain may follow moderate exposure to the sun and also to cold, the head never becoming hot nor the face flushed. A long exposure to the sun's rays, or a greater degree of cold, invite an active form of cerebral congestion. If the congestion be moderate and promptly attended to, and the child is of good constitution, the attack passes off gradually and the usual health soon returns. It is in the initial stage that threatening mischief may be averted. This irritable state of the brain is, in many cases, primarily one of anemia of the brain, as already stated, for the vital powers are first depressed and lowered. The brain is imperfectly nourished. It ceases to respond. It has lost its tone. The little patient has pains in the head; his pupils are contracted, and he shuns the light; he is disturbed by dreams, and sleep is unrefreshing. The irritability persists until the congestive stage is reached, when it vanishes altogether, or is supplanted by lethargy and indifference. The distribution of blood through the brain in life is not uniform; some parts are more abundantly supplied than others; hence we come to understand why cerebral hemorrhage is common to certain situations, and softening of the brain in the adult from partial anemia in other parts, when the proper blood-supply is obstructed and the circulation is disturbed. In young children the peculiarities of the cerebral circulation are more noticeable, and by reason of the fact that ossification of the skull is incomplete and the fontanelles are open and elastic, the amount of blood within the cranium is subject to great variation. Partial anemia of certain parts of the brain, followed by local congestion of other parts, may possibly explain some of the symptoms I have described, and the influence which the circulation must have upon the functions of the brain.

Congestion of the brain in early life very frequently succeeds the stage of irritation, if it does not usually accompany it in a greater or lesser degree. This arises from the readiness with which the brain circulation is disturbed. Young children in good health, who go too long without food, or do not obtain sufficient sleep, get wayward, fretful, and exhausted. When food and rest are obtained, the symptoms subside, and, the circulation being strengthened, they pass away. This is a state of irritation, and exhaustion is its chief cause.

The *diagnosis* in cases of irritable brain is rarely difficult. Failing health, caprice of manner, fits of ill temper, lassitude, pallor, loss of appetite, and unrefreshing sleep are among the earliest and characteristic signs. But even these symptoms may mean little in a young child, as they are common to many slight ailments, and quickly pass away. At the same time we cannot be too watchful, as there is an ever-threatening danger while the brain is in active growth and development. As the disorder steals on, sleep becomes disturbed, and the cheeks occasionally flush. With these symptoms

there may be no elevation of temperature, and no acceleration of the pulse, for the nervous system has not yet transmitted any disquieting influence to the circulation. A considerable time may elapse before we know there is any headache, for the child may be too young to express its sensations; but if the hand is frequently raised to the head while it rolls from side to side on the pillow, we may be tolerably certain that it is uneasy and painful.

In typical cases of congestion of the brain in children there are, in addition to the symptoms I have enumerated, severe headache and often vomiting. Sometimes there is much oppression, lividity of the face, and a tendency to heavy sleep, hence the similarity to meningitis in its later stages. Usually, however, the two affections run a different course. In simple congestion, if the constitution is good and no convulsions occur, the fever is slight and the attack passes off in a few days. This is not the rule in meningitis.

If we turn to the temperature as a means of diagnosis, it is worthless if not taken in connection with other signs. The temperature in fatal cases of meningitis may not reach the height it does in simple irritation, but it generally does, and at the time of death is much higher. In the fifth case the temperature ran up to 104°, and yet the constitutional symptoms were nothing like so severe as in the first, second, and fourth cases. The temperature is exceedingly mobile in children of nervous temperature, rising and falling with extraordinary rapidity on very slight provocation.

In long standing examples of cerebral congestion and disturbance, vascular changes may be expected to occur in the optic disks. Active congestion is such a near approach to inflammation that the line of demarkation can hardly be drawn. The two conditions are generally blended, a minor degree of inflammation being mixed up with, or superadded to, the cases of irritable brain and congestion. It is in cases of purely irritable brain that ophthalmoscopic changes are generally absent, and according in nearly all the cases I have related none were found. Too great importance should not be attached to any ophthalmoscopic appearances that may be present in the cases I have been describing. We have seen that no optic changes were noticed in the cases that were *irritable* rather than *congestive*. As these are often absent in simple meningitis, and sometimes in the tubercular variety, even when it occurs, as it generally does, at the base of the brain, I think caution is needed before coming to a hasty conclusion.

*Treatment.* A favorable result depends in a great measure on meeting the symptoms with promptitude at the outbreak, when there are only slight headache, alteration of manner, and disturbed sleep to guide us in that early stage, when it is impossible to say what is the essential cause of the trouble, what is its exact nature, and what is its probable termination.

*Rest*, in these cases of irritable brain, is to be