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SOME POINTS CONNECTED WITH PERIODIC BREATHING.

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By the various writers who have devoted themselves to the study of disturbances of the rhythm of the respiration, different views have been taken in regard to the classification of the symptoms observed. It is held on the one hand, that all examples of intermittent respiration are simply varieties of one type, linked together by a regular series of gradations; it is asserted, on the other, that there are sharp lines of demarcation which distinguish several kinds of phenomena essentially different from each other. Into the merits of this discussion it is no part of the present paper to enter, but in the pages which follow it will be found that my opinion is distinctly inclined towards the view that there is no essential difference between the various modifications of the respiratory rhythm. According to this acceptation of the facts, periodic breathing is understood to denote intermittent respiration, irrespective of the regularity or irregularity of the pauses which take place, and also irrespective of the manner in which the pauses occur. In a characteristic example of Cheyne-Stokes respiration, for instance, the pauses occur with a certain degree of regularity, and the alternation of activity and repose takes place by means of a series of crescendo and decrescendo respirations, while in a typical example of cerebral breathing the pauses take place irregularly and the transition from the one phase to the other is abrupt; there are, however, many intermediate varieties of periodic breathing which serve to unite these two outstanding forms.

It is now generally known that periodic respiration is not infrequently accompanied by periodic changes of phenomena depending upon the condition of the great nervous centres. The centres which are most commonly involved in the general

condition causing the respiratory symptom are the vagus, vaso-motor, pupillary, and convulsive centres in the medulla oblongata, as well as the higher centres of the brain concerned in the maintenance of the conscious state. Periodic variations in the rhythm of the respiration are accompanied, for this reason, by periodic changes in the rate and tension of the pulse, in the size of the pupil, in the state of the muscles, and in the condition of the mind, as to sleep and waking consciousness and unconsciousness. Into the general cause of these different phenomena it is not my present intention to enter.

The purpose of the following remarks, however, is to show that whatever may be the nature of the condition underlying the associated symptoms, it may begin to cause the effects which depend upon it by affecting the lower centres in the first place and spreading to the higher, or it may commence in the higher and afterwards invade the lower centres. This is an aspect of the subject to which no reference has hitherto been made in the extensive literature which has already been accumulated in regard to it.

Taking up, in the first place, disturbances of the respiratory rhythm, unaccompanied by any of the commonly associated phenomena, the simplest mode of occurrence of such a symptom which has fallen under my observation, was the appearance of typical Cheyne-Stokes breathing during the progress of a case of pneumonia. The patient in this instance was a lady, aged 73, who was attacked by pneumonia affecting a limited area of the base of the left lung. The temperature never exceeded 103° F., and the pulse was never above 108; the respirations, however, reached 36, and there was a considerable amount of coughing. From the disease she made an excellent recovery. On the third day after the crisis, while the temperature was 98·2° F., the pulse 80, and the respiration 28, Cheyne-Stokes breathing appeared. It was present during a period of four days, and at no time could any changes in the rate or tension of the pulse, in the state of the pupils, or in the condition of the consciousness be observed to accompany the different phases of the respiration.

In this case it seemed probable that the centre concerned in the maintenance of the respiration was exhausted by the troublesome cough, as well as by the effects of the recent febrile affection. It could hardly be regarded as within the bounds of possibility that the small area of pulmonary disease could have diminished the oxygenation of the blood to such a degree as to act on the medulla.

Similar cases in which periodic breathing has been caused by tubercular meningitis have come under my notice without any associated phenomena. In some of these the intermissions have been regular, but in others they have been very irregular.

An interesting case of cardiac failure was recently under my care, in which Cheyne-Stokes respiration made its appearance. In this instance, however, the cause which gave rise to the respiratory symptom affected the centres for the movements of the iris and the eyelids, as well as the higher centres for mental processes. In such cases the period of breathing is accompanied by the return of consciousness, opening of the eyelids, and dilatation of the pupils ; the pause, on the contrary, by contraction of the iris, closure of the eyelids, and a condition resembling sleep. The patient in this instance was a gentleman, 66 years of age, who lingered for several months before he died. During this period the symptoms just mentioned occurred at frequent intervals.

It is in uræmia, according to my experience, that periodic breathing is most frequently met with, and it is also in this affection that it is most commonly associated with the other phenomena referred to above. In several cases presenting the complex symptoms known as uræmia, periodic breathing has been, under my observation, accompanied by alternate contraction and dilatation of the pupils, closure and opening of the eyelids, unconsciousness and consciousness, and in one or two of them there have been at the height of the respiratory movements conjugate deviation of the eyes and general convulsive movements of the whole body. Such cases afford a complete clinical picture of the associated symptoms. In many other patients suffering from chronic renal disease and its consequences

there is an unvarying condition of unconsciousness with periodic breathing.

The cases thus shortly referred to present a regular series of symptoms, commencing with those showing consequences depending upon some affection of the respiratory centre alone, and passing through others having a progressive tendency to involve different centres.

But the periodic changes produced by alterations of the centres may commence in, and be limited to, those which are not concerned in vital phenomena. The case of a child, who was lately under my care when suffering from what clearly seemed to be tubercular meningitis, but which, owing to the recovery of the patient, may appear to have been possibly an error in diagnosis, will illustrate my meaning. The patient was a little girl, aged three years, presenting all the symptoms of subacute tubercular meningitis. During the course of the disease, when watching her carefully one day, a periodic closure of the eyelids attracted my attention, and on further observation it was easy to determine that along with this closure of the lids there was a simultaneous contraction of the pupils, and a state of complete unconsciousness. This condition remained for several seconds, the eyelids were then raised, the pupils dilated, consciousness returned, and the child raised her head to look about. The conscious state was present for some time, how long it is not possible for me to say, as it did not occur to me to notice the interval, and was in its turn followed by the unconscious condition. In this case there was never, so far as my observation went, any tendency to a periodic change in the rhythm of the breathing.

It seems to me that such a phenomenon can only be regarded as analogous in every way to intermittent respiration, and, if this be granted, it follows that the thesis with which this contribution began must be admitted to be proven.