

1898, an attempt was made to dilate under an anæsthetic and some progress was made, bougies up to No. 4 entering without much difficulty or bleeding. I saw the patient on the following day and found that he had passed only a small amount of blood-stained urine since and that his bladder was largely distended, reaching to a level with the umbilicus. He was in great pain and was sweating profusely. He was again placed under an anæsthetic and a small catheter was passed but very little urine escaped. As it was obvious that clotted blood formed the main contents of the bladder and that it must be removed without delay the process of stricture dilatation was at once further proceeded with until a full-sized Lister's bougie could be passed. A large catheter-evacuator was then substituted and a mass of clotted blood was withdrawn by the aspirator as used for litholapaxy. In this way the bladder was soon cleared. A full-sized rubber catheter was then tied in and the patient speedily recovered. Though the full calibre of the urethra is restored the partially atonic condition of the bladder continues, as there is a constant residuum of six ounces or so unless the catheter is used—the result of a neglected stricture though in a young man. It would not have been possible to evacuate these clots in any other way except by opening the bladder either in front or from the perineum.

CASE 2.—A man, aged 72 years, with a large prostate for which he used a catheter was seen by me in June, 1898, in consequence of hæmorrhage into the bladder, the latter when seen being enormously distended. Some blood-stained urine had been drawn off, but without lessening the size of the viscus. Several large-eyed catheters were ineffectually tried. As the bladder was evidently full of blood-clots the patient was placed under ether and the evacuating catheter and powerful aspirator were used without avail. As it looked as if it would be necessary to open the bladder I first passed a smooth-bladed lithotrite and broke up the mass of clots just as if it were a stone. In this way a hand-basinalful of clots and urine was withdrawn and the bladder was cleared. A rubber catheter was tied in and the patient did well. This was the first time I had used a lithotrite for this purpose, but it answered admirably and made the process extremely easy.

It was suggested that the hæmorrhage had in the first instance been caused by the catheter. I do not believe that this was so. I have seen many cases where old men apparently bled into their bladders instead of into their brains. I refer to instances of vesical apoplexy which are not uncommon. One patient, now aged 75 years, whom I have known for some years, has had his life prolonged, I believe, by this less dangerous substitute for cerebral bleeding. Hence in some of these instances, a "masterly inactivity" is often indicated. When, however, the bleeding attains the proportions stated in this case interference becomes necessary. Failing with the lithotrite there did not appear to be any other alternative than that of opening the bladder above the pubes. The use of the lithotrite, however, proved to be the solution of the difficulty.

CASE 3.—A man, aged 47 years, came under notice at the hospital in November, 1898. For some weeks he had been attending as an out-patient for the purpose of having a No. 6 bougie passed for a contractile stricture in the deep urethra. On the day in question a No. 7 flexible bougie was passed. There was some tightness and a little bleeding followed. The patient returned at night with almost complete retention and with the bladder greatly distended, apparently with urine but, as it proved, more with blood and clots. The house surgeon succeeded in emptying it with an evacuating catheter and aspirator. On the following day the amount of distension and pain was as much as before. As the bleeding was unchecked and as it evidently proceeded from the strictured portion of the deep urethra I had the patient placed under ether again. I passed a medium-sized grooved staff and performed a perineal section, dividing the stricture in the median line. A large gum-elastic rigid drainage-tube was then passed into the bladder. About two pints of clots, blood, and urine were evacuated and the bladder was washed out and the tube was fastened in. For this purpose I use incompressible tubes¹ which were made for me some years ago by Mr. J. W. Wood of Liverpool. Being rigid, in case of bleeding from the deeper portion of the section it enables the surgeon to pack round the tube with gauze without interfering with the constant flow of

urine from the bladder. This was not necessary in this instance as I took pains to make the section through the deep parts fit the selected drainage-pipe. The tube was removed in seven days and the patient was able to leave the hospital in three weeks with the wound soundly healed. His stricture has been greatly benefited and he now has a full-sized bougie passed when he applies as an out-patient. Here the single proceeding that was adopted at once stopped the bleeding at the spot from which it came, allowed the bladder to be emptied of a mass of clots which could not otherwise have been readily disposed of, and considerably improved the condition of the stricture. Digital exploration of the bladder, as Sir Henry Thompson described it, has reduced to simplicity the old perineal section without restricting its application.

I may here incidentally refer to a somewhat curious case of prostatic hæmorrhage and vesical distension recently seen. It was the case of a patient with prostatic enlargement who was entirely dependent upon the catheter. Whilst travelling to the North by an express train he had occasion to use his flexible catheter in the lavatory department attached to his carriage. Just as he had inserted the instrument and as the train was passing over some points he was thrown with great violence against the side of the carriage before he had time to withdraw the catheter. He felt hurt and faint and considerable hæmorrhage by the urethra followed and continued with much distension. I was requested to go down to see him with his medical attendant a few days afterwards and I found that he had suffered most seriously from the injury. The distension had been relieved by the catheter but the wound of the prostate, from which no doubt the hæmorrhage came, was followed by a sharp attack of epididymitis; the patient, however, made a good recovery. From the examination of the circumstances connected with the injury it was a marvel that the patient escaped a ruptured bladder. The case is not without its practical aspect.

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THE OCULAR PHENOMENA ASSOCIATED WITH CHEYNE-STOKES RESPIRATION.¹

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THE ocular phenomena which occur in association with Cheyne-Stokes breathing are worthy of attention not only as clinical facts, but as possibly helping to throw light upon the etiology of this interesting symptom. Cheyne-Stokes breathing as described in the words of Stokes² consists in the occurrence of a series of inspirations increasing to a maximum and then declining in force and length, each inspiration being less deep than the preceding one until they are all but imperceptible and then a state of apparent apnoea occurs. This is at last broken by the faintest possible inspiration, followed by one more decided, marking the commencement of a new ascending and then descending series of respirations. In some cases the sequence of events is not so perfectly regular.

In the majority of recorded cases of this periodic alteration of the rhythm of respiration no eye symptoms whatever have been observed, but in a certain number definite disturbances of the intra- and extra-ocular muscles have been seen. The first recorded observation was made in 1866 by Leyden³ who in the course of some experimental observations upon the brains of animals succeeded in producing Cheyne-Stokes breathing and noted that the pupils were contracted and that a form of nystagmus set in during the pause in the respiration. Leube⁴ reported four years later a case from Ziemssen's clinic of mitral stenosis with ascites in which Cheyne-Stokes breathing came on after a dose of morphine. He observed that the eyes were open during the stage of breathing and were closed during the cessation of respiration, and that during the pause the pupils were contracted and failed to react to alterations of light; with the first returning breath, or in some cases

¹ A paper read at a meeting of the Leeds and West Riding Medico-Chirurgical Society on Feb. 3rd, 1899.

² Diseases of the Heart and of the Aorta, 1854.

³ Archiv für Pathologische Anatomie und Physiologie und für Klinische Medizin, 1866, p. 549.

⁴ Berliner Klinische Wochenschrift, 1870, p. 177.

¹ Figured in Surgical Disorders of Urinary Organs, fourth edition, p. 104.

shortly before it, they dilated again. Synchronously with the contraction of the pupils there was an automatic conjugate deviation of the eyeballs, the right eye turning out and a little downwards and the left inwards and a little down to a corresponding extent, this movement being repeated each time during the pauses, the eyeballs returning to the normal position during the respiratory period. Hahndel,⁵ Merkel,⁶ Carrer,⁷ Sacchi,⁸ Biot,⁹ and several others have described similar cases with pupils contracted and not reacting to light during the pause, accompanied at times by conjugate deviation of the eyeballs. Cuffer¹⁰ has produced typical Cheyne-Stokes breathing with the pupil changes described above by the injection of ammonium carbonate into a vein; and Smirnow¹¹ reports similar phenomena together with anæsthesia of the cornea occurring in animals after breathing sulphuretted hydrogen mixed with air. Hein¹² mentions a case in which the pupils were of moderate size during respiration and became gradually smaller with the descending phase and gradually widened with the ascending series of respirations. Robertson¹³ describes two cases of cerebral hæmorrhage with similar pupil changes, in one case the pupils continuing to react to light but not doing so in the other one. Finlayson¹⁴ was the first to report a case of Cheyne-Stokes breathing in which there was a rhythmic enlargement of the pupil with each individual respiration followed by a contraction of less degree with each expiration during the ascending phase and a reversal of the process during the descending phase, so that the pupil was contracted during the pause and widely dilated at the period of deepest breathing. Terrien¹⁵ relates a case in which the pupils contracted down to the size of a needle-point during the stage of apnoea and became so dilated with the maximum inspiration as to render the iris almost invisible. At the same time there was a periodic anæsthesia of the cornea but not the slightest movement of the eyeballs. Langer¹⁶ describes a case in which there was a periodic convergent strabismus with contracted but unequal pupils during the pause. It is interesting that no changes in the retinal vessels have been observed in association with these pupil changes; Schepelern,¹⁷ Ewald,¹⁸ and Knies¹⁹ have specially investigated this point and reported in the negative. Dr. Barrs has given me the notes of a very interesting case of a child presenting many of the symptoms of tuberculous meningitis. On the fourteenth day of the disease Cheyne-Stokes breathing set in with associated movements of the eyes and head. The sequence of events was as follows: "The child sighs and half groans as if a pain has seized her in the head and then the ascending phase of breathing and head-rolling begins, the head being carried with each inspiration to the left with greater and greater excursions till the maximum is reached and gradually subsides again." With the movements of the head were associated conjugate movements of the eyeballs. It is interesting to know that this child recovered in the course of a few days and that she has remained perfectly well ever since.

We now have to consider some rather anomalous cases which present many of the symptoms above described but without Cheyne-Stokes breathing being present. Bullard and Wentworth²⁰ have reported the case of a child, two years old, who was suffering from whooping-cough and convulsions in which slight twitchings of the face set in and finally horizontal nystagmus with Cheyne-Stokes rhythm manifested itself. The pupils remained equal and reacted to light. Ultimately coma set in and death followed. No post-mortem examination was obtainable. The nystagmus was horizontal and began with rapid movements, the oscillations becoming progressively larger and more extended to a certain point and then diminishing in the same manner. A pause then

ensued which was followed by a repetition of the previous rhythmical movements. The condition recurred at intervals during the day. There was no Cheyne-Stokes breathing and there were no marked pupillary symptoms. Dr. J. A. Gibson²¹ has related the case of a child who presented all the symptoms of subacute tuberculous meningitis, but he remarks that owing to the ultimate recovery of the patient this may possibly appear to have been an error in diagnosis. He says, "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 the 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 a short time 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." Belonging to this group of cases, each member of which is obviously allied to the others, differing only in detail and filling a gap in the series, are two cases observed by myself.

CASE 1.—A man, aged 23 years, was the subject of chronic left otorrhœa. He suffered from headache and general malaise, and pyrexia had been present for 10 days and was followed by tenderness of the mastoid. Opening and draining the mastoid cells did not relieve the symptoms, and drowsiness followed by stupor set in. The pulse was 100 and regular; the temperature was between 102° and 104° F., and the respirations were about 32 to the minute and perfectly regular. There was some rigidity of the limbs with exaggerated knee-jerks. At this stage I noticed that the pupils although equal and reacting to light were undergoing periodic rhythmic fluctuations in size. At the commencement of the cycle the pupil was about 1.5 millimetres in diameter and gradually and steadily dilated up to about five millimetres, subsequently slowly contracting to its former size, the whole stage occupying about 50 seconds, and after remaining contracted for a few seconds the cycle was repeated. At no period was the reaction to light interfered with and there was no nystagmus or other deviation of the eyeballs, and as mentioned above no alteration in the rhythm of respiration. Subsequently coma set in and was followed by death. At the necropsy a patch of localised meningitis was found over the affected temporal bone, with some flakes of lymph dotted about over the general surface of the pia mater.

CASE 2.—A man, aged 32 years, suffered from acute left otorrhœa of five days' duration. Headache, pyrexia, slight rigors, and some drowsiness were the leading symptoms. The mastoid antrum was opened, but no collection of pus was found and the lateral sinus which was also explored was found to be healthy. The pyrexia continued and there was considerable drowsiness alternating with periods of restlessness, but consciousness was not at all impaired and responses to questions were ready and intelligent. The knee-jerks were brisk and equal. The temperature was 101°, and the pulse was 100, full, and regular. The respirations were 24 to the minute and perfectly regular. At this stage the pupils displayed the same periodic movements which have been described in connexion with the first case. Ultimately coma set in, followed by death. At the necropsy a subdural abscess was found which had burst through the dura mater and had involved the right lobe of the cerebellum.

Considering all these cases, reported by so many observers, it is evident that the ocular symptoms met with in association with Cheyne-Stokes breathing are of considerable variety, and, moreover, that they may be observed in what we may conveniently call a Cheyne-Stokes state or condition apart from any disturbance in the rhythm of respiration. Every variety of case may be seen, from simple Cheyne-Stokes breathing to the complete clinical picture of persistent and regular Cheyne-Stokes respiration accompanied during the pause by unconsciousness, closed eyelids, contracted pupils, and lateral conjugate deviation of the eyeballs, the pulse during this period being frequent, small, and of moderately high tension. At the end of some seconds consciousness returns, the eyes open, the pupils slightly dilate, the pulse loses some of its tension, and a superficial respiration follows. Cases intermediate in character with one or more of these

⁵ Ueber das Cheyne-Stokes'sche Respirations-phänomen, 1870.

⁶ Deutsches Archiv für Klinische Medizin, 1871, p. 424.

⁷ Gazeta Medica Italiana, 1877, p. 403.

⁸ Rivista Clinica di Bologna, 1877, p. 33.

⁹ Étude clinique et expérimentale sur la Respiration de Cheyne-Stokes, 1878.

¹⁰ Recherches cliniques et expérimentales sur les Altérations du Sang dans l'Urémie, &c., 1897.

¹¹ Centralblatt für die Medicinischen Wissenschaften, 1884, p. 641.

¹² Deutsches Archiv für Klinische Medizin, 1880, p. 569.

¹³ THE LANCET, Nov. 27th, 1886, p. 1016.

¹⁴ Glasgow Medical Journal, 1887, p. 221.

¹⁵ Le Progrès Médical, 1898, p. 18.

¹⁶ Wiener Medicinische Presse, 1882, p. 1253.

¹⁷ Hospitals Tidende, 1872, pp. 77, 81.

¹⁸ Berliner Klinische Wochenschrift, 1874, p. 169.

¹⁹ The Eye in General Diseases, 1895, p. 171.

²⁰ Boston Medical and Surgical Journal, 1892, p. 301.

²¹ Birmingham Medical Review, 1889, p. 30.

phenomena associated with the Cheyne-Stokes breathing are recorded, clearly showing that whatever may be the nature of the condition underlying this group of symptoms occurring in the Cheyne-Stokes state, it may produce the effects which depend upon it by affecting the lower centres in the first place and spreading upwards to the higher, or by acting upon the higher first and afterwards invading the lower centres. Further, the cases reported by Bullard and Wentworth, by Gibson, and by myself show that the periodic changes produced by alterations in the centres may commence in, and be limited to, those which are not concerned in vital phenomena.

It is not desirable to consider in detail the numerous theories which have been suggested at various times to explain the causation of Cheyne-Stokes breathing. These have been fully stated and adequately discussed in Gibson's exhaustive monograph on the subject. It is quite clear, however, that any theory to be accepted must satisfactorily account for the whole of the associated phenomena. Filehne's²² well-known theory, to which many writers still adhere, that the action of the vaso-motor centre is an important or predominant factor, is obviously entirely inadequate to account for phenomena which may occur without any changes in the pulse or even in respiration. A modification of the theory originated by Luciani²³ and elaborated by Rosenbach²⁴ and by Gibson,²⁵ that some special condition of the respiratory and other centres is responsible for the whole series of phenomena, is the only explanation at all satisfactory. The investigations of Langendorff²⁶ on kittens and of Sherrington²⁷ and others on frogs show that the respiratory centre is automatic and when freed from the influence of the higher centres becomes periodic in action. This is confirmed by the observation of Mosso²⁸ and others that periodic breathing is common in hibernating animals, and has been not infrequently observed in the human subject during deep sleep, especially after great exertion. Other medullary nuclear centres governing the heart's action and blood-pressure exhibit the same periodic tendency when cut off from the influence of the higher centres. If by cerebral pressure, by uræmic blood, by deficient arterial supply, or by the administration of certain drugs the control of the higher centres is lessened or abolished, the lower centres will tend to show periodic variations in the manifestation of their activity, more or less regular inversely as the control is exercised. This is the condition which I have ventured to describe as the Cheyne-Stokes state. The anatomical relations between the various nuclear centres affected in the production of this state are obvious and that anyone or several or all may be involved is equally clear, but the cause of the selective action is as yet quite unknown. It will only be by the careful comparison of accurate records of cases of a nature allied with those now reported that we can hope to arrive at a satisfactory solution of this problem and at the same time determine the diagnostic or prognostic value of the individual phenomena of this group of symptoms.

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"COLLES'S LAW" OR "WALLACE'S LAW"?

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THE association of the name of Colles with the clinical observation "that the child born of a mother who is without any obvious venereal symptoms will infect the most healthy nurse whether she suckle it or merely handle and dress it yet that this child is never known to infect its mother even though she suckle it while it has venereal ulcers on the lips and tongue," seems to be generally accepted in this country. Subsequent confirmation of such observations by Diday led him in conformity with the law of oneness of constitutional syphilis to refer to Colles's constant rule as "Colles's law," and, notwithstanding his admission in acknowledgment of the view of Baumes and a possible case of Cazenave that "this rule like every other must have its exceptions," he nevertheless thinks that "we are fully justified

in asserting that a child born syphilitic through the agency of its parents never communicates the disease to the mother who suckles it." The validity and interpretation of Colles's law have comparatively recently been contested by Dr. Coutts¹ and Dr. G. Ogilvie,² and while the probability of exceptional cases has since become generally recognised their interpretation and consequent deductions are controversial points. On the one hand, Mr. Hutchinson, relying upon the general rule as opposed to the constant rule that one attack of syphilis confers for the most part protection against subsequent infection, regards these rare exceptions (a case of which he has never met with himself) as second affections, analogous to the cases of second affections in the male.³ On the other hand, Dr. Coutts has suggested that the mother's apparent immunity may be due to the antitoxins of her infant in utero and that such immunity is not equivalent to acquisition of the disease itself. These exceptions may therefore be regarded as primary acquisition of disease. I myself, relying largely upon the repetition of manifestations in subsequent conceptions and during the puerperal period, have ventured to suggest that the mother's immunity, in accordance with Mr. Hutchinson's views, is equivalent to acquisition of disease, and that these exceptions might possibly be regarded as relapsing disease or, as noted in a case of Whitehead's, true secondary sore of the nipple with enlarged axillary glands induced by suckling. On the other hand, relying upon the disappearance of symptoms after delivery, I have ventured to suggest that the freedom from symptoms and immunity were conferred on the mother by processes in herself connected with full pregnancy, involution, and lactation, and that therefore these exceptions might be regarded as re-infections.⁴

In turning over the pages of THE LANCET of March 25th, 1837, recently, I unexpectedly came across a review of Colles's work and much to my surprise I found that considerable doubt was thrown upon the priority of Colles's observations in general. Appeal is made to the original work of W. Wallace, whose oral lectures in Dublin had appeared and were appearing in THE LANCET for 1833-34 and 1836-37. On referring to these lectures all the observations of Colles appear, apparently independently. Some of these observations—viz., the acquisition of disease by the "dry" nurse; in "wet" nursing; the transmission from secondary disease and the consequent modification—appeared in THE LANCET of Feb. 13th, 1836; others—viz., the contagious nature of the two forms of disease (hereditary and acquired) in the infant; the acquisition of disease from a strange child "not her own child"; disease as well as apparent immunity in the mother of a diseased infant—appeared in THE LANCET of May 7th, 1836, which was undoubtedly before the publication of Colles's work which was dated Jan. 20th, 1837, while the lecture dealing especially with the general immunity of the suckling mother to the disease of her own child appears in THE LANCET of May 20th, 1837. Another observer of similar facts appears in THE LANCET of March 11th, 1837. The remarks of Dr. P. Doepp, physician-in-chief to the Children's Hospital, St. Petersburg, on certain diseases in children, founded on a total number of 18,000 patients presenting themselves at that hospital from 1830 to 1833, are published from the translation of Dr. P. H. Green. Dr. Doepp testified to the hereditary (paternal) origin of disease in the infant as opposed to disease acquired from the mother during delivery; to the disappearance of manifestations in the case of a mother during pregnancy; to the immunity of the suckling mother to disease of her own child; to the fatality attending the separation of such infants from the breast; and to the devotion of those who suckled them in spite of the attendant risk.

The question of priority, however, is of minor importance in comparison with the observations and interpretations of Wallace as contained in these lectures published in THE LANCET and "through the medium of this journal" announced to "the whole profession"—"productions which for richness in fact, exactness of detail, and scientific precision of arrangement, have never been surpassed, probably not equalled by any series of clinical discourses hitherto

²² Berliner Klinische Wochenschrift, 1874, p. 152-165.

²³ Lo Sperimentale, 1879, p. 341.

²⁴ Zeitschrift für Klinische Medizin, 1879, p. 533.

²⁵ Cheyne-Stokes Respiration, 1892.

²⁶ Archiv für Anatomie und Physiologie, 1891, p. 494.

²⁷ Journal of Physiology, vol. xii., p. 229.

²⁸ Archiv für Physiologie, 1878, p. 441.

¹ THE LANCET, June 9th, 1894; "Infantile Syphilis" (Hunterian Lectures), THE LANCET, April 11th, 18th, and 25th, 1896.

² "Is Colles's Law a Misnomer?" THE LANCET, Dec. 1st, 1894; "The Exceptions to Colles's Law" (Royal Medical and Chirurgical Society), THE LANCET, Feb. 1st, 1896.

³ Proceedings of the Royal Medical and Chirurgical Society, 1896.

⁴ Transactions of the Third International Congress of Dermatology, 1896.