at the nose or ears, but has seen instances of men coming to the surface bleeding from those parts, though from nowhere else. Mr. A. C. "has never known an instance of a diver bleeding from anywhere but the nose, mouth, or ears", and then only through fright or exhaustion. Mr. G. C. has seen instances of men coming up bleeding at the nose and ears. He thinks that must be through weakness, for they were in shallow water, and only about one hour down. With respect to the influence of the state of health of divers on their sensations under water, some very interesting particulars are contained in Mr. A. C.'s letter. He observes; "the general symptoms are, in my opinion, to be gathered from the man's own state of health, or habits; if he is given to drink, then you may expect an accident, or sudden death, at any time; or, if he is consumptive, or his chest the least affected, the air is not sufficiently pure for him. During the latter part of my time as instructor in the *Excellent*, I had been suffering from chest disease; and the last time I was down I could not remain five minutes, as the air was not pure enough for me to breathe." Mr. G. C., when having a slight cold, felt hot flashes all over his body, and a pricking sensation. Now, if a column of thirty-three feet and ten inches of water exert a pressure of about 15 lbs. on the square inch, at a depth of 108 feet, the pressure will be equal to about 47.9 lbs. on the square inch: a man of a height of 5 ft. 8 in., the surface of whose body would be equal to from 2,325 to 3,100 square inches, would therefore, at the depth of 108 feet, support a pressure of water of from 111,367 to 148,490 lbs. At the seaside, the atmospheric pressure on such a person would amount to from 34,875 to 46,500 lbs. He would, therefore, while at a depth of 108 feet from water, be subjected to a pressure of from 76,492 lbs. to 113,615 lbs. in addition to the weight he had to bear from the atmosphere at the seaside. On coming to the surface, this enormous excess of pressure is got rid of; no wonder a sensation should be felt of rushing of blood to the head, and that sometimes hæmorrhage should follow. The most remarkable feature of immersion in deep water is, perhaps, the fact that respiration should be carried on, apparently without difficulty, under such pressure; and it is natural enough that, should the diver have anything the matter with his lungs, his respiration should be seriously interfered with; in such cases he becomes liable to be poisoned by his own carbonic acid, as the blood must find it very difficult under such a pressure, and especially when the lungs are not in a perfect state of health, to emit the carbonic acid it contains; the air is not too impure for the diver to breathe, but his blood becomes impure from its retaining its own carbonic acid. The phenomenon is precisely the same as when increased pressure is brought to bear on boiling water; the boiling instantly stops, and steam ceases to be evolved.

Now, the difference of pressure of the atmosphere on the human body at the seaside and top of Mont Blanc amounts to about 15,432 lbs., being reduced by nearly one-half; and we can readily imagine the greater freedom with which carbonic acid will part with the blood in the lungs at such an elevation. It is really impossible to refrain from sharing Dr. Lombard's feeling of wonder that the body should be able to adapt itself to such extremes of external physical conditions.

An apology is due on my part for having gone so far astray of the subject, as stated in the heading of this communication. I have thought the above physiological considerations, which are not unconnected with my subject, of sufficient interest to warrant my calling the reader's attention to them on the present occasion.

TREATMENT OF CHOREA BY ARSENIC IN LARGE DOSES.

ARSENIC has long been regarded as an useful therapeutic agent in the treatment of chorea, but it may not be generally known that the curative value of the drug is greatly increased by administering it in full doses. The tolerance of children for arsenic is a matter of common observation, and this tolerance is especially marked in the case of a non-febrile disease, such as chorea, where there is no increased irritability of the digestive organs. To a child between the ages of five or six and twelve, the subject of this complaint, Fowler's solution may be given in doses of ten minims three times a day, directly after meals. The influence of this treatment upon the disorder is seen almost immediately, and it is rare for any of the physiological effects of the drug to be observed. By this means, cases of the disease which had resisted smaller doses of arsenic may be cured in a few days, and even severe cases seldom last longer than a fortnight or three weeks.

EUSTACE SMITH, M.D., F.R.C.P.

DIPHThERITIC PARALYSIS:

ITS NATURAL COURSE, PATHOLOGY, TREATMENT, AND RELATION TO PARALYTIC AFFECTIONS FOLLOWING FEVERS.*

BY SIR JOHN ROSE CORMACK,

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In recording this case, I have but slightly abridged the original bedside reports, believing that complete histories of complex cases care fully observed from first to last are most appreciated by clinical students. Moreover, abstracts are not only historically imperfect, but they are apt to be biased statements, from the narrator unintentionally giving undue prominence to the facts which most support his own particular views. A desire to avoid this evil, and to allow readers to form their own conclusions from complete data, is my reason for having detailed some cases at great length. Having, however, occupied so much space with minute clinical histories, I must (leaving for the present some additional illustrations of the relations of paralysis to enteric fever, to the puerperal state,† and to hysteria) proceed briefly to illustrate the relations of paralysis to cholera, dysentery, and small-pox.

PARALYSIS DURING AND AFTER CHOLERA.

There is an excellent paper on temporary glycosuria by Mr. William Sedgwick, in the *Medico-Chirurgical Transactions*, founded on observations which tend to prove that there had existed paralysis of the abdominal sympathetic nerve prior to the glycosuria, and that the occurrence of the latter would serve to show that, during reaction from previous collapse, there is "a temporary excess of restorative effort".

It is well known that patients convalescent from cholera, in common with persons recovering from various diseases, often require the catheter to be used, in consequence of temporary paralysis of the bladder. Dr. Sutton has noted (page 412 of *Simon's Ninth Report to the Privy Council*, 1867), that "in more than one case four or five pints of urine were drawn off in twenty-four hours". He gives in detail the case of a woman, aged 39 years, whose husband and three children died in the East London Cholera Hospital from the disease. The woman was attacked with cholera at 2 A.M. on October 6th, 1866, and was admitted to the hospital at 7 A.M. on the same day. After a residence of nineteen days, she was dismissed in full convalescence. It is specially stated, in the history of this case, that, at 3 A.M. on October 16th, three pints, and on the 17th a similar quantity of urine was drawn off.

Dr. Henri Jaubert, in his thesis (Paris, 1866), *De la Convalescence du Cholera*, states that he had had the opportunity of observing 888 patients of both sexes and of all ages in a temporary asylum established for the reception of convalescents from cholera. Under the heading, "Accidents Nerveux", he gives three classes of cases; viz.: 1. Cases of cramps of limbs; 2. Cases of contractions of the extremities; 3. Cases of different forms of paralysis. In this last division, after referring to the observations of Dr. Mesnet (*Archives Générales de Médecine*, Fév. et Mars, 1866), he relates the case of a man, aged 60, who, during the course of the malady, was all at once attacked with weakness (*faiblesse*) in the entire right side of the body, including the face. When the patient was first seen by Dr. Jaubert, the right naso-labial sulcus was slightly obliterated, the commissure was depressed, and the tongue deviated slightly towards the right. It was with the utmost difficulty that he could make any use of the right arm and leg. He was, however, able to stand, and, with the assistance of a crutch, he could take some steps. He walked like a mower, advancing one foot before the other. There was inertia of the bladder (*vessie paresseuse*). After eight days' residence, the patient left the Convalescent Home in the state now described. It is to be regretted that this case remained under observation for so short a period.

Dr. Jaubert mentions another case of hemiplegia following cholera, which he had seen, but of which he did not take notes. In this case, the paralysis suddenly manifested itself at the commencement of reaction.

Dr. Jaubert likewise mentions having seen two cases of incomplete paralysis of motion and sensation. The subject of the first of these cases was a male patient in the Convalescent Home. When admitted, there existed nearly complete insensibility of the little finger and ring-

* Partly read before the Medical Section at the Annual Meeting of the British Medical Association in Norwich, August 1874.

† The best clinical account of this subject is that given by Dr. Fleetwood Churchill of Dublin. It constitutes the seventeenth chapter of the fifth edition of his work on the *Diseases of Women*, and is entitled Paralysis occurring during Gestation and in Childbed.

fingers, and of the inner half of the middle finger; the prick of a pin was not felt unless a deep thrust were made. The gentle friction of the arm with anything was not perceived by the patient. The anæsthesia extended up to the elbow, but it was less in degree in proportion to the nearness of the situation to the elbow: it was limited to the cubital half of the arm. In the right foot, the two outer toes and the external half of the third were similarly affected. In the left foot, the affection was limited to the great toe. The paralysis did not extend to the leg on either side. The motor power was modified in a similar manner to the sensation. The patient could neither flex nor extend the affected fingers and toes. The paralysed parts were the seat of an unpleasant formication. This case was under observation during only a part of its course. The history concludes with the statement that, when the patient left the Convalescent Home at his own request, he was more paralysed than on admission. In the other case, there was no loss of motor power; and the anæsthesia was limited to the distal half of the ring-finger and little finger of both hands.

Magendie, in his *Leçons sur le Choléra*, published at Paris in 1832, refers to paralysis as a sequel of cholera. He says that the way in which it begins to manifest itself is generally so gentle, that the patients seem to experience only extreme debility and a dislike for food. In about eight days, he says they pass into a state of profound prostration; the muscles of the face are paralysed, and those of the limbs become quite flaccid. The mental powers grow torpid, and at last death takes place, with a general destruction of all the vital powers.

The epidemics of 1849 and following years furnished numerous cases in which paralysis was secondary to cholera. Gubler refers to a series of lectures delivered in 1849 at the Bicêtre by Dr. Delasiauve, upon cases in which attacks of cholera had been followed by mental alienation and paralysis.

Dr. O. Landry, in his work *Sur les Causes et les Indications Curatives des Maladies Nerveuses*, states that, during the cholera epidemic of 1849, a man suffering from a formidable attack of the disease was admitted, under the care of Piedagnel, to the hospital of La Pitié at Paris. During convalescence, paralysis ere long invaded the superior and inferior extremities, without the occurrence of any symptoms of the nervous centres being involved. Micturition and defæcation continued to be performed in a normal manner. The muscles became atrophied. Treatment having proved unavailing, the patient was transferred to the Bicêtre as an incurable.

Briguet and Mignot, in their *Traité du Choléra Morbus*, published at Paris in 1850, mention three cases which occurred during the epidemic of 1849, in which partial paralysis manifested itself in convalescence from cholera. In one of these cases, the paralysis was limited to the hands. In the two other cases, the superior and inferior extremities were affected: in both cases, the paralysis first showed itself in the superior extremities. In the three cases, recovery from the paralysis took place. As Gubler remarks, in referring to these cases, it is noteworthy that restoration of power commenced in the hands, and that the paralysis remained longest in the feet and legs—noteworthy, because the same order in recovery is observed in the paralysis consecutive upon diphtheria and other acute diseases.

PARALYSIS DURING AND AFTER DYSENTERY.

Dysentery has sequelæ similar to cholera in respect of sensation and motion.

On the 22nd April, 1872, I was telegraphed for to meet in consultation Dr. Bazard at Dijon, in the case of an English gentleman, who was laid up at an hotel in that town, unable to proceed on his homeward journey from Egypt to London. I reached the bedside of the patient between five and six o'clock on the afternoon of the 22nd. He had, I was told—excepting occasional remissions lasting for a day or two—been severely suffering for some weeks from dysentery. During the whole of that period, he had been travelling homewards by short stages, suiting his journeys as much as possible to his ebbing strength. His paramount idea had evidently been to get home to obtain efficient treatment; for he had only casually consulted physicians on the way, and had never placed himself under serious treatment till his arrival at Dijon, when it was too late. At the date of my visit, the sanguineous alvine flux had entirely ceased, there remaining, however, a very irritable state of the intestine, manifested by diarrhœal stools quickly following the reception of food into the stomach, if more than two or three tablespoonfuls of beef-tea, breadberry, or thin arrowroot gruel were taken. The cessation of the dysenteric flux had not, however, been followed by any restoration of strength or any other sign of real amendment. On the contrary, the debility had alarmingly increased during the preceding two days, and within that period there had also supervened, or at least there had been first observed, inertia of the bladder and partial paralysis, with

anæsthesia of the lower extremities. When I arrived, there was anæsthesia and incomplete motor paralysis of both legs. There was no impairment of the motor or sensory power of the superior extremities, or of the muscles of the face, tongue, or œsophagus. The intelligence was not affected. The urine was scanty and slightly albuminous. The pulse was about 90, weak, and intermittent. My questions were answered fully and clearly. I passed the night in an adjoining room. The door between the two rooms being ajar, I heard all that passed. He spoke to the nurse at intervals in a distinct voice, and took beef-tea, arrowroot, and wine, when they were offered, at short intervals. I was twice summoned to his aid during the night, in consequence of his being attacked by dyspnoea. On both occasions, he obtained considerable relief from the application of large thin poultices of linseed-meal and mustard to the thoracic parietes. When I left early in the morning for Paris, he had just awoke from a short sleep. He concurred with me and Dr. Bazard in thinking that he was in a rather better state than on the previous day. On arriving at my house in Paris, I received a telegram, dated noon, requesting me to return to Dijon. I had made my arrangements to do so, when another telegram, dated 3 P.M., informed me that he had just expired. I afterwards learned that his death, till within an hour of its occurrence, did not appear imminent. It seemed (as I afterwards learned) to have been caused by profound general prostration and paralysis of the respiratory muscles. Death was not preceded by delirium.

Recently, I was consulted by a military officer passing through Paris, on his way home from India on sick leave. He had suffered severely from dysentery, followed by debility and a great loss of power in both inferior extremities, which, he said, at one time amounted to complete paralysis. When I saw him, he could walk with the aid of a staff. He had a very anæmic appearance, and was suffering much from constipation. He was taking citrate of iron and quinine, which I recommended him to continue, with the addition of a dinner aperient pill, containing a grain of the extract of *nux vomica*. I saw this patient only twice, and have had no opportunity of knowing anything of the course of his malady subsequently to my last interview with him.

Zimmermann says that, in some persons who have had severe attacks of dysentery, it is not unusual in convalescence to meet with paralysis of the mouth and tongue, and sometimes of the whole of the lower part of the body. Sometimes, he says, universal paralysis manifests itself simultaneously with the cessation of the dysentery. He does not describe any individual cases. (*Traité de la Dysentérie*: traduction Française, p. 13. Lausanne: 1794.)

I have had several patients under my care for paralysis of the rectum, who traced that affection back to severe dysenteric attacks of old date.

The frequent occurrence of intractable inertia and paralysis of the rectum after dysentery has led some authors to attribute this inertia and paralysis to dysenteric lesions of the intestinal canal. A fact of kindred character is noteworthy in the present inquiry; viz., that paralysis following dysentery attacks the inferior more frequently than the superior extremities. As a rule, in paralysis of cerebral origin, the superior extremities suffer most severely and far more frequently.

[To be continued.]

FOUR CASES OF A PECULIAR EPILEPTIFORM DISEASE.

WITH SYMPTOMS INDICATIVE OF SPECIAL IRRITATION OF THE NERVE-CENTRE OF ARTICULATE SPEECH.

By W. B. CHEADLE, M.D., F.R.C.P.,

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THE cases here recorded exhibit epileptiform disease in one of its rarer and most curious forms. Trousseau has described seizures of an analogous kind in his *Clinique Médicale* as varieties of epileptic vertigo. As in Trousseau's cases, so in these, there is something more than the mere transient giddiness of the ordinary *petit mal*; something less than, and different in character from, the full epileptic fit. They have one distinct feature in common, although it is not equally prominent in all; viz., rapid muttering, the frequent hurried repetition of the same word or phrase during the convulsion; so that this special variety might, perhaps, be designated "eclampsia loquax", or "muttering epilepsy".

CASE I.—Albert H., aged 18, draper's shopman, first came under the care of Dr. Cheadle at St. Mary's Hospital in March 1868, suffer-

* The cases are reported by Mr. G. C. A. Moir.