favourable. The cases which required the simplest treatment, and which were the most favourable in event, were children under two years old. I think I have witnessed as many, or even more, recoveries among persons whose frames were naturally delicate, than among robust muscular persons. The alteration in the character of the countenance is perhaps one of the best indications of recovery, accompanied with returning heat without external agency, and a pulse palpable at the wrist. I have not seen a single instance of a patient being affected with cholera twice in the hospital; many have been in twice, but in every such instance, where I had means of ascertaining the facts, I always found that one or other of the attacks had not been true cholera.

(*To be continued.*)

ART. XXIII.—*A new Mode of making an early Diagnosis of Aneurism of the Abdominal Aorta.* By DOMINICK J. CORRIGAN, M. D., one of the Physicians to Jervis-street Hospital, Lecturer on the Theory and Practice of Medicine, &c.

1st CASE. Mr. H——, ætat. 27; he had been of very intemperate habits, and had undergone several mercurial courses for the cure of repeated attacks of syphilis. On the 19th April, 1832, when I first saw him, he complained of violent pains, occurring at irregular intervals, shooting through the abdomen, especially the left hypochondriac and lumbar regions. These accessions of pain were frequently accompanied with spasms of the abdominal muscles. He also felt pain in his back while making any exertion. The bowels were very much constipated, and he described the sensation felt on every effort of swallowing, as though the morsel or fluid stopped just before reaching the stomach, and then passed round towards the left side in its route towards the stomach. No enlargement of the liver could

be discovered. These symptoms commenced about two years before the date of this report. Mr. H — stated, that during great portions of the time, he had enjoyed good health and immunity from pain. Latterly the attacks of pain and spasm had become more frequent and violent. As in most similar melancholy cases on record, the treatment during the two years had been of the most varied kinds, directed to the spine, stomach, or liver, as symptoms seemed to indicate, or as opinions on the nature of the disease varied. Bleeding, leeching, blistering, baths, remedies for dyspepsia, narcotics, country air, exercise, rest, all in turn had been had recourse to, and all with equal want of success. At different periods, under some new mode of treatment, he frequently seemed to be completely recovered, but the interval of ease was always a deception, and the treatment which before had seemed to succeed, always failed on a repetition.

On making a very accurate examination of the abdomen, I felt on the left side, immediately below the most prominent part of the cartilages of the ribs, a very deeply-seated and obscurely pulsating tumour; by means of the stethoscope *bruit de soufflet* was heard in it, and on deep percussion a dull sound elicited. In order to ascertain from what cause the peculiar sensation felt in swallowing proceeded, I directed Mr. H. to swallow some fluid while I applied the stethoscope over the cardiac opening of the stomach. After the effort of swallowing there was a momentary pause, and then the loud gush was heard of the fluid entering the stomach, as if it had been driven into the stomach with the force of a syringe. To relieve the urgent symptoms of pain, spasm, &c., blood was taken from the arm, an opiate draught given, and opiate fomentations ordered to the abdomen. On the next day Mr. H. experienced so much relief that he believed himself quite well, and in this amended state he continued until the 25th, when he was suddenly seized with symptoms resembling those of peritoneal inflammation. His belly became swollen and tense, and on the

left side, from the cartilages of the ribs to the crest of the ilium, very tender under pressure. He vomited incessantly, his bowels were constipated, urine was passed in very small quantity, and the countenance expressed great anxiety. In addition to these symptoms, the right leg, below the knee, had been cold and insensible, but still preserved, in a slight degree, the power of motion, while sensation, &c. was perfect from the patella upwards. In describing this attack, he said that the pain in the left side came on at first in fits, and on each fit he felt the right leg becoming more numbed and cold, and at length, at the time of my visit, about noon, it had, as described above, lost all heat and sensation. There was no venous congestion of the limb. The pulsation of the tumour was at this time violent, and contrasted strangely with the pulse, which was very feeble and weak. A blister was ordered to the side, and an opiate given. Some ease was obtained, but next morning there was an exacerbation of the symptoms, which continued until the middle of the day, when death ensued.

Post mortem, next day. Abdomen distended, no peritoneal inflammation. On turning aside the intestines the aneurism came into view, about the size of a small orange, in front of the aorta, and arising from it, just as this vessel cleared the opening in the diaphragm. The tumour lay close upon the cardiac opening of the stomach. The sac of the aneurism was half filled with coagula. It was composed merely of cellular tissue, and communicated with the aorta by a large circular opening with a well defined thick rounded margin formed of the middle coat of the artery. The vertebræ were not at all affected. The sac had burst by a small opening behind the peritoneum, and had poured out several pounds of blood, which, forcing its way behind the left kidney, formed a layer of coagulated blood, from one to two inches in thickness, behind the peritoneum, pushing forwards the posterior layer of this membrane, the kidney, and the intestines, and extending but as a layer of less thickness into the pelvis, where

it completely enveloped the muscular coat of the bladder, and then passed across the pelvis, but still behind the peritoneum through its whole course. No blood was effused into the cavity of the peritoneum, into the stomach or intestines. The liver was of the pale yellow hue so frequently seen in scrofulous subjects, rather under size, friable and soft. Gall bladder full of healthy bile.

The nature of the disease had not been discovered by any of my predecessors while attending the case, and I should probably have been equally unsuccessful, but that from some accidental circumstance, such as the intestines being more than usually empty, the pulsation of the tumour had come within reach. The early discovery of the existence of this disease is often a matter of the greatest importance, and it is also one of the greatest difficulty. The symptoms are so uncertain, that unless the pulsating tumour be plainly felt, or "*bruit de soufflet*" be heard, the nature of the disease can at best be only suspected. The pulsating tumour must, however, attain a considerable size before it can be felt with the hand, and if, as in the case related by Dr. Beatty in the 5th Vol. of the Dublin Hospital Reports, the aneurismal tumour be situate behind the aorta, between that vessel and the spine, the difficulty of discovering it is greatly increased. If an aneurism be in a constant state of distension, equally as the arterial trunk with which it is connected, then can there be no gush of a diverging current of blood into it; there can be no vibration of its parietes, and there will of course be no *bruit de soufflet*. This is frequently exemplified in aneurism of the aorta within the thorax, which, when thus circumstanced, and not coming in contact with the parietes, affords no direct sign whatever of its existence. An aneurism of the abdominal aorta is peculiarly calculated for preventing the production of *bruit de soufflet* in it, for when the patient either stands or reclines with the shoulders elevated, the column of blood in the descending aorta is of sufficient pressure to keep the aneurismal sac in a state of constant distension equal to that

of the vessel itself; and hence there can be no gushing current of blood into it on each contraction of the heart, and of course no "*bruit de soufflet*."

It occurred to me that if I could relieve an aneurism of the abdominal aorta from this hydrostatic pressure that keeps it constantly distended, thus preventing that gushing current into it which produces "*bruit de soufflet*," this sign might become perceptible, and we should then be able, by its presence, to diagnose aneurism of the abdominal aorta at a much earlier period than we have yet been able to achieve. I shall now relate a case in which I carried this idea into effect.

On the 11th of October, 1832, I saw Mr. M—, ætat. 38, of temperate and active habits. His principal complaint was of debility in all his limbs, but greatest in his arms, in which he experienced a sensation of intolerable fatigue, even from their own weight, after walking or making the least exertion. His voice was peculiarly low and weak, resembling the characteristic voice of cholera, but he presented no other symptom of a laryngeal affection. He complained of soreness in the epigastric region. This region, and both hypochondria, appeared prominent and smooth, destitute of any muscular lines, and presenting just such a projection as an enlarged liver might produce; but no defined edge or solid viscus could be traced. The epigastric region was tender on pressure, and on percussion it sounded dull, while all the lower portion of the abdomen sounded clear: no pain referred to either shoulder, and he could lie without difficulty on his back and on either side. The stomach was irritable, and appetite very bad; a small portion of underdone beef was the only food he could eat with relish; tongue slightly coated; bowels regular; cough occasionally a little troublesome after lying down, seldom accompanied with any expectoration; skin hot; pulse 100, wiry. The history given to me was, that having previously enjoyed good health, he was, about three months before, attacked by vomiting, which

returned for three or four mornings successively ; that he then felt his appetite and strength failing, and began to perceive the soreness of the epigastrium, but its prominence never attracted his attention. A most careful examination of the chest did not reveal any sign of heart or lung disease. Quite unable at this visit to discover the nature of the affection, I prescribed for the most pressing symptoms, leeches to the tender epigastrium, and a mild purgative. The evacuations brought away by the purgative were perfectly healthy, and the tenderness of the epigastrium was very much diminished by the application of the leeches. He was then put on minute portions of blue pill and extract of gentian, and a milk diet. This improved his appetite, and agreed with him better than any previous plan of treatment. On the 23d there was scarcely any alteration of the symptoms, but that the weakness was greater. The bowels having been very free for a few days, and the abdomen in consequence less swollen than before, I made another careful examination of the epigastrium, and I thought that on making deep and steady pressure with my hand I could perceive more than the natural pulsation half way between the umbilicus and the ensiform cartilage, and a little to the left of the median line. On applying the stethoscope, I could, however, only hear the action of the right side of the heart transmitted downwards, and a strong pulsation, which might be only that of the aorta. The idea mentioned above now occurred to me, that if there were aneurism of the aorta, *bruit de soufflet* might not be produced in the erect posture, and yet that for the reason already mentioned it might become evident, if the sac were relieved of the hydrostatic pressure above it, by placing the patient in a perfectly horizontal position. I desired him to lie in that position, and then, after the lapse of a few minutes, applied the stethoscope, when I heard distinct and sharp "*bruit de soufflet*" (*bruit de scie* of Laennec) in the situation of the pulsation. It could also be heard in the left hypochondrium, but ceased to

be heard to the right of the median line, and did not extend downwards along the median line more than half way between the ensiform cartilage and the umbilicus, again diminishing in intensity as the stethoscope was moved upwards, until at the ensiform cartilage it was replaced by the natural sounds of the right side of the heart. On making him resume the erect position, the "*bruit de soufflet*" vanished. This experiment I have very frequently since repeated, and always with the same result. Sometimes a moment's lying in the horizontal position has been sufficient to make the "*bruit de soufflet*" evident, at other times it required a lapse of two or three minutes before the sound became very distinct. This is what would be expected. There is now (November 30) at the date of my writing these observations for publication, no longer any doubt of the nature of the disease. The pulse is intermittent, and the pulsation of the tumour is so plain that it cannot be passed over.

I can conceive (although I am not aware of such a case) that an external tumour pressing on the abdominal aorta, and diminishing its calibre, might, in an examination conducted as directed here, produce "*bruit de soufflet*" by its effect in narrowing the calibre of the aorta at a particular point; but in any large artery thus narrowed, the "*bruit de soufflet*" is heard beyond the narrowing to some distance along the track of the vessel, while in aneurism the sound is confined to the dilated part.* If an aneurism of the abdominal aorta have very firm and unyielding sides, as from thick deposition of fibrin within it, it is perhaps not likely that change of posture could do much towards the production of "*bruit de soufflet*," for such an aneurism would, from its thick walls, not yield to allow any blood to leave it; it would remain in a state of permanent distension in any change of position, and there being no vibration

* For an account of the laws regulating the production of *bruit de soufflet*, *vide* *Lancet*, 1829, Vol. ii. p. 1, and a paper on "Permanent Patency of the Mouth of the Aorta," &c.—*Edinburgh Medical and Surgical Journal*, No. iii. Vol. xxxvii.

of its parietes, there would not, of course, be any "*bruit de soufflet*;" but in most commencing cases of aneurism of the abdominal aorta, before the deposition of fibrine has taken place to much extent, the mode of examining for the disease, which succeeded in the present instance, may, perhaps, be a means in future cases of discovering the disease at an earlier period of its existence than we had heretofore been able to attain.

I shall now trespass on the reader's attention with a few short observations, naturally suggesting themselves from the above cases. The first of these cases presented those painful accompaniments of spasm which are among the most distressing effects of aneurism of the abdominal aorta. In the case already alluded to, related by Dr. Beatty, these attacks of spasm formed a most distressing feature.

The primary symptoms with which the second case set in, namely, vomiting, &c. are remarkable. On this point Mr. M. is quite positive, that the attack which he thought at the time was one of bilious colic, was the commencement of his illness. In a case related by Drs. Graves and Stokes in their Clinical Report of the Meath Hospital, published in the 5th Vol. of the Dublin Hospital Reports, the history of the case was traced to a similar commencement: "Robert Hamilton, ætat. 29, locksmith. He had enjoyed good health until the beginning of November, 1828, (about four months before the date of the report), when, after exposure to cold, he contracted severe pains in the loins, extending towards the umbilicus, and accompanied by a fit resembling colic. In a case which some years ago came under my observation, a lady was seized immediately after breakfast with violent vomiting and colicky pains. Circumstances connected with the case gave rise to a suspicion of poisoning; an examination took place, and the heart was found ruptured. A very small opening through the parietes of the left ventricle had permitted the blood gradually to distend the pericardium. In a case related by Dr. Townsend in the second number of this Journal, a woman recovering from an attack of

pneumonia was seized with violent convulsions, and expired in them. On dissection, the inner and middle coats of the ascending aorta were found ruptured transversely, to the extent of an inch and a half. Another similar case occurred under the observation of an intelligent medical friend. The patient, a stout man, was attacked with spasms of the stomach and trunk, and very soon after died. The case was, at the time, calculated to excite great alarm, as it occurred just at the time when cholera had made its first appearance in this country. . A rupture of the aorta, with effusion of blood into the pericardium, was the cause of death. Bertin, in his work on diseases of the heart, gives a case of rupture of the heart in which severe vomiting occurred, but attributes the rupture to the vomiting; from the above cases, it is far more probable that the vomiting and spasm were themselves only symptoms of the impression made on the nervous system by the sudden lesion of an important vital organ, as the heart or aorta. With this view, in the second case related in this paper, and in the case extracted from Dr. Graves' and Stokes' report, the vomiting and colicky symptoms indicated the moment when the rupture of the aorta took place, which was the commencement of the formation of aneurism. Indeed, this view is raised almost to a certainty by three of the cases given above, when death quickly followed upon the rupture, and in every one of which vomiting or spasms occurred, which could only be referred to rupture of the heart or large artery. If this view be not taken, the symptoms resembling colic, &c., from which a patient labouring under aneurism dates the commencement of his illness, are exceedingly likely to mislead his attendant, and to divert attention away from the real nature of the disease; but with the view here given, these symptoms will be considered not as affording evidence of disease having its primary seat in the functions of the stomach or intestines, but as indicating the particular period to which the commencement of the aneurism may be referred.