is the most important, as it is in truth the resultant of many other factors."

My attention was attracted by the repeated coincidence of what are called "colliery warnings," appearing in the daily papers, with urgent messages to attend patients attacked with hæmorrhage from the lungs. The coincidences were so frequent that I could not avoid concluding that there was some connection between the one and the other. Time after time cases have arisen either immediately before I saw the "warning" or very often on the day that the public notice appeared. From these notices I naturally turned to the barometer, to learn that in almost every case the pressure of the atmosphere was exceptionally high.

At first my attention was taken up almost entirely by cases of hæmoptysis; but, as the apparent cause began to impress itself on my mind, hæmorrhages, less striking at first, arrested interest. From the observations I have made from time to time during the past few years, I have come to the conclusion that there is a marked affinity between a high barometer and hæmorrhages of various kinds. My earlier notes are missing, but the following compressed particulars of recent cases will bear out my statement as to the close relation that appears to exist between a high barometric pressure and the tendency to rupture of blood vessels that are not in a healthy condition.

CASE I.—J. H. Phthisis. Hæmoptysis for first time on November 20th, 1894. Barometer 30.0.

CASE II.—Mrs. A. Amenorrhœa for three months. Not pregnant. Menstruation resumed on December 1st, 1894. Barometer 30.46.

CASE III.—D. L. Girl aged 9. Purpura rheumatica. Extensive subcutaneous hæmorrhages on December 2nd, 1894. Barometer 30.38.

CASE IV.—Mrs. B., aged 41. Phthisis. A trifling hæmoptysis, began on December 10th, 1894. Barometer 29.77.

CASE V.—Mrs. Z. Pregnant three months. Hæmorrhage set in on December 13th, 1895. Barometer 29.25. Abortion followed.

CASE VI.—Mrs. C., aged 68. Diabetes, paralysis, and sequelæ of influenza. Cerebral hæmorrhage, followed by death within an hour, occurred on April 14th, 1895. Barometer 30.12.

CASE VII.—Mrs. X., age under 60. Arteries markedly atheromatous, probably specific. Cerebral hæmorrhage on April 15th, 1895, followed by death. The barometer stood on that morning at 30.8.

CASE VIII.—W. M. Intestinal hæmorrhage on April 27th, 1895. Disease doubtful. Barometer 29.73.

CASE IX.—Mrs. C., aged 41. Phthisis. Hæmoptysis on May 3rd and 5th, 1895. Barometer 30.6 and 30.4 at the respective dates.

CASE X.—Mrs. G. Slight pulmonary hæmorrhage on May 3rd, 1895. Barometer 30.6.

CASE XI.—Mrs. S., aged 92. Senile degeneration; extensive hæmorrhages beneath skin of face on May 5th, 1895. Barometer 30.4.

CASE XII.—P. M., aged 17. Phthisis; hæmoptysis on May 5th, 1895. Barometer 30.4.

CASE XIII.—A. R. Slight cerebral hæmorrhage followed by temporary paralysis. The patient a man of plethoric constitution, aged between 50 and 60. Date May 6th, 1895. Barometer 30.56.

CASE XIV.—H. W. Phthisis; slight pulmonary hæmorrhage on May 7th, 1895. Barometer 30.51.

CASE XV.—Mrs. A., aged 52. Amenorrhœa for three months (menopause). Period reappeared at end of April, 1895, the loss continuing slight till the beginning of May, when it became copious.

The barometer readings given are only corrected to the temperature of 32° but not to the sea level.

As will be seen from these cases, during the first week of May the readings of the barometer were exceptionally high. It may be raised as an objection to my deduction that the cases quoted are mere coincidences; but when similar coincidences have occurred time after time during several years' observations, the conclusion drawn is a fairly justifiable one. It will be observed, too, that these hæmorrhages are very varied in character, and are consequently more significant.

It is not my intention to attempt to give a scientific explanation of how the atmospheric pressure, when abnormally high, produces such results. My reason for not essaying this task is that I am inclined to the opinion that there are other conditions of the atmosphere which, in concert with that of the atmospheric pressure, act on the body in such a way as to cause an unusual strain upon the vascular system. While I am fully alive to the importance of information upon these other states of the atmosphere, the unravelling of which I must leave to others, I shall consider that the purpose of this paper has been attained should it have the effect of attracting the attention of the profession, especially those members of it engaged in general practice. To the latter, the fact that an examination of the barometer may often warn them of danger that menaces a patient should not be without its value.

It will be observed that there are no cases given bearing on surgical practice; but, if there is a stratum of truth in the subject, the observation should not be uninteresting to the specialist in surgery.

A CASE OF ROENTGEN PHOTOGRAPHY.

By HOWARD MARSH, F.R.C.S.,
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THE following case affords so good an illustration of the assistance in diagnosis which may be afforded by the Roentgen method of photography that it seems worth while briefly to record the facts, and to give the pictures which were obtained.

A subaltern, aged 22, was riding, and put his horse at a fence. The horse fell and rolled over him. I saw him three hours later with Brigade-Surgeon-Lieutenant-Colonel Leake and Surgeon-Captain Salvage. As he was becoming (after having been for a time quite conscious) deeply insensible, as his pulse was small and going down towards 50, and as he had been very violently sick, it seemed probable that intracranial hæmorrhage was taking place, and that the case might end fatally. His left arm was evidently severely injured in the neighbourhood of the elbow-joint, but there was so much swelling and blood extravasation that it was not possible to venture a precise opinion as to what lesion had occurred. It seemed probable, however, that he had sustained a fracture of the lower end of the humerus, extending into the elbow-joint. Having regard to the very grave condition of the patient it was agreed that no close examination should be made, but that the arm should, for the next few hours, be merely kept at rest on a splint. The next morning all grave cerebral symptoms had passed off, and his general condition was quite favourable; the arm, however, was then still more swollen, and no accurate opinion could be formed as to the nature of the injury. Under these circumstances it was proposed that a Roentgen photograph should be obtained. This was taken in the afternoon by Mr. T. Moore, of Blackheath, in association with Mr. Webster, F.R.C.S. The plate was exposed for about thirty minutes, and the photograph was at once developed. Fig. No. 1 was the result, and the existence of an uncomplicated dislocation backwards at the elbow-joint was thus very completely demonstrated. The upper arm was then photographed, the exposure lasting a quarter of an hour, and the picture showed that the shaft of the humerus was entire. The patient was at once placed under chloroform and the dislocation reduced. Photograph No. 2 was then taken, and it showed that the displacement had been completely corrected.

Some regard the Roentgen photography merely as a scientific toy, and it is, no doubt, often employed where it can give no valuable information. Moreover, it is very probable that unless great caution is used in accepting the evidence which it may appear to afford it will lead to either positive or negative conclusions which are erroneous. But in cases of injury of the long bones, and especially of injuries involving the articular ends of the bones, and when it is a question what the precise injury that has been sustained may be, the method will often be valuable in the highest degree.

Many surgeons who would like to use the method may not have the necessary apparatus within reach. In such instances common prudence must suggest a reference to the subject, and an expression of every willingness to promote any feasible plan for procuring a Roentgen picture. The information given by this method may be absolutely conclusive, and may directly contravene the best opinion that the most highly-qualified observer has had it in his power—under the difficult circumstances of the case—to form. With a photograph before him any layman can see what by any other means could be only a matter of probability, balanced by other probabilities of almost equal weight. From a medico-legal point of view the Roentgen photography will clearly play a leading part in cases where surgeons are charged with having overlooked a fracture or a dislocation when no such injury is present.

It will also have a conclusive answer to give in cases in which irregular practitioners charge surgeons with having overlooked a fracture or when they advance the mythical statement that "one of the small bones is out." It would have furnished valuable information to a patient, met with some years ago, who had slight lateral curvature of the spine. This patient was told by a bonesetter that "his pelvis had opened and both his hips were out." The reassurance and

Fig. 1.—Showing dislocation backwards at the elbow joint.

Fig. 2.—Showing the bones after reduction.

mental calm which a Roentgen photograph could now bring to anyone who, having nothing seriously wrong, had been told he was the subject of such a formidable condition of things can be easily imagined.

ON HERNIA: WITH CASES.¹

By J. LLOYD ROBERTS, M.B.,

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I TAKE it that ordinary reducible hernia is much more frequent in general practice than is commonly supposed, and this opinion is founded upon the number of trusses annually supplied through the Denbighshire General Infirmary, which probably provides by far the greater number of trusses worn in this district. About 100 trusses will be annually supplied through the infirmary for first wearings and renewals. It is not possible to compare this number with either population or area or to give it a statistical value; but it may be said for comparison—though all the truss wearers are not charity patients—that this figure is out of some 2,500 patients annually treated by the charity.

By briefly citing illustrative cases a classification of cases and their peculiarities will be followed.

CASE I.—Mrs. L., aged 45 years, wife of a small farmer, had a reducible femoral hernia, which became complicated with, and could not be reduced because of, a large abscess which formed over the site of the hernia. I opened the abscess freely, and about 2 ounces of most offensive faecal-smelling pus escaped, showing the nearness by contact of the pus with the bowel. There was no immediate connection between the bowel and the abscess. The patient made a good recovery.

CASE II.—A child, about 16 months old, was brought to me from St. Asaph with an inguinal hernia, which could not be reduced because of a hydrocele. This hydrocele I tapped. The child, being frightened by this proceeding, struggled so as to prevent reduction of the hernia at this sitting. As there was no urgency the attempt was suspended, and at a subsequent visit the bowel was readily returned.

The next case is one which required no operation, but is an example of what amount of "nipping" a bowel can endure without serious injury.

CASE III.—A man, aged about 20 years, whilst lifting hay on to a load, late on a Saturday afternoon, ruptured himself. He walked home, about one-third of a mile, took an aperient, and bore until the Monday afternoon following, when he came to my out-patient room at the infirmary. I had him placed in a hot bath for about half an hour, and by taxis with difficulty reduced the hernia, about forty-eight hours after the rupture had taken place. After two days in bed, and before the bowel had acted, this man ran away, giving as a reason to others in his ward that "he was not going to stay there to be starved." Nothing further was heard of him, and no truss was subsequently applied for, so that at least no detriment followed the abrupt termination of treatment, nor was there return of the hernia.

Two cases of almost spontaneous reduction of strangulated hernias have occurred to me, both with fatal results.

CASE IV.—An old man, of some 65 years of age, was sent from St. Asaph into the infirmary for operation. The diagnosis of strangulation was accepted and verified without much application of taxis, this having already failed. Just when operation was about to be commenced, on fingering the tumour lightly the bowel returned itself into the abdominal cavity. The patient died in about two days' time, and on *post-mortem* examination was found to have the included parts and their surroundings coated with pus.

CASE V.—An old man, W., aged 73 years, I saw on March 11th, 1895, with a medical friend who had before seen the case during the course of the day, at a house some five miles out of town. He had a large and exceedingly painful irreducible inguinal hernia, formed by an accession of bowel to an old standing reducible hernia. Morphine had been given. As vomiting and the other signs of strangulation were pronounced, the place and every attendant circumstance being most unsuitable for an operation, more morphine was given, and the patient was removed in a brougham to the infirmary. All was immediately got ready for operation. Before administering an anæsthetic a colleague was asked to verify the strangulation, when upon the slightest touch the hernia reduced itself. Trouble was subsequently experienced in keeping this rupture up. About a week after admission a quantity of bowel came down, which threatened to be irreducible. A day or two afterwards this bowel came down a second time, and proved irreducible. On commencing to administer the anæsthetic—A. C. E. mixture—for operation, the patient twice so seriously fainted that operative procedure had to be abandoned. *Post-mortem* examination showed more strangulation (if any) in the sac than in the ring.

OPERATION CASES.

CASE VI.—J. J., aged 43, was admitted into the infirmary on May 18th 1891, and discharged on June 2nd. His was a recent inguinal hernia, and operation was performed a few hours after accident.

CASE VII.—T. R., aged 58, was admitted on May 21st, 1888, and died on May 24th. At least forty-eight hours—with a long journey by road and by rail—intervened between the time of rupture and the operation.

CASE VIII.—J. M., aged 80, treated by expectancy first and operation

afterwards, died. Probably expectancy and taxis had on former occasions proved successful.

CASE IX.—J. H., aged 35, a farmer, was ruptured by lifting a heavy coffin at a funeral. After the funeral he returned home to see his doctor, who sent him to the infirmary. On November 8th, 1889, operation was performed without delay, about six or seven hours after the accident. Uninterrupted recovery took place, and he was discharged on November 30th.

CASE X.—R. J., a farmer's child, aged 1½ year, was brought to me on July 24th, 1894, with a strangulated hernia of some twelve to sixteen hours' standing. Ordinary methods of reduction failing, an operation was advised, but refused. The following day, however, I saw the child at his home (eight miles away), when operation was readily assented to. I sent the child into the infirmary, and at 6 P.M., or about forty-three hours after the rupture was found, operated and reduced the hernia satisfactorily. An uninterrupted recovery followed. The child was discharged on August 7th. In this case I desire it to be noted that no repeated or prolonged applications of taxis were made. As a detail in the operation I may say that in making up the wound I closed the inguinal ring with a suture. A truss was worn for some time, and there has been no return of the hernia.

CASE XI.—G. M., 29, a carter. On Friday, September 28th, 1894, about 7 A.M., whilst at work at Rhyl, an old-standing reducible (congenital) hernia was suddenly increased by the accession of more bowel into the sac. By pain and other signs he recognised his condition, and being far away from his home he started to walk to the St. Asaph Workhouse, a distance of five miles, for the necessary help. Without tasting a bit or a drop of anything sustaining, and after resting and sleeping under hedges and haystacks, he reached St. Asaph on the Monday afternoon following. From there he was sent by train to the Denbighshire Infirmary. Operation was at once decided upon, and performed at 8 P.M., or some eighty-five hours after the accident. No taxis was tried more than was sufficient for diagnostic purposes. On opening the sac a large quantity of fluid escaped, the colour of a port-wine negus. The bowel included in the sac was also of a very deep colour, comparable with that of a fruity port wine, but it had not lost its glistening surface, though this was of much less than ordinary brilliancy. As much fluid as could be got at was drained away, and the bowel returned into the abdomen. The pillars of the congenital sac were stitched together as high up as could be reached, and the wound made up. Opium was given, and though the operation was well borne I had gloomy forebodings as to the result. However, about 1 A.M., or five hours after the operation, the bowels acted spontaneously. In subsequent actions, as in this, no blood was passed, neither was there any intractable diarrhoea. An uninterrupted recovery took place, and when the patient was last seen or heard of there was no return of the hernia.

I desire now to advance some general principles upon the treatment of or surgical interference with strangulated hernia; and I think that though these cases are few and varied the latter cases will sustain by their results the evidences upon which these principles are based. It is not claimed that any of these observations or principles are particularly new, but that these cases are very illustrative.

1. That the earlier herniotomy is performed after strangulation of bowel is made out the better are the patient's chances of recovery. Indeed in serious cases of hernia I would say more than this, that less risk is run to life by an operation early done than by delay, expectant treatment, and taxis periodically applied. The fatal result in Case VII, in which the operation was performed 43 hours after injury, and previous treatment had been tried, is an instance of the latter part of this proposition. And Case VIII is another. On the other side the rapid recoveries of Case VI and of Case IX (St. Asaph) who were both operated upon within a few hours of rupture illustrate the former part.

2. That frequent or severe applications of taxis do more injury to a strangulated bowel than does the mere strangulation at the ring. None of these cases show any direct or visible injury to bowel by the direct application of taxis, but it is too evident that taxis is an additional violence to an already damaged organ or structure. Whilst one regards the deaths after an amount of expectant treatment, there are in contrast Case X, the infant who was operated upon 43 hours after rupture, and Case XI, operated upon 85 hours after rupture. In neither of these two cases was there any expectancy treatment or taxis tried. In these even after the long endurance of strangulation, or at least of rupture, there were no inflammatory or other unfavourable symptoms developed to interrupt a uniform course of recovery.

3. That a strangulated bowel can tolerate a very considerable amount of "nipping" or squeezing, both as to character or degree and as to time, without injury to its vitality. Case XI illustrates this. This bowel, even after all the hours of strangulation, recovered itself of the paresis due to strangulation in five hours, as shown by the spontaneous action of the bowel. And Case III, in which the hernia was reduced by taxis forty-eight hours after injury (and who "levanted" from treatment before any indication of the bowel paresis having been overcome was manifested), also strongly tends to

¹ Read at a meeting of the North Wales Branch of the British Medical Association.