daily hours, within half an hour, by observing the position of the sun. Now, what this *sensational man* did in reference to time, other *sensational animals* may do in reference to direction of motion.

MECHANICAL INJURIES IN A CASE OF CON- GENITAL PURPURA.

By FREDERICK WATERHOUSE, M.R.C.S., Pont-y-Pridd.

UNTIL very recently, we have been taught to regard purpura and the hæmorrhagic diathesis as disorders distinct and unconnected, and but few of us would have been disposed to consider them identical. As lately as 1867, Dr. Garrod writes (BRITISH MEDICAL JOURNAL, p. 6, vol. ii), that the hæmorrhagic diathesis "differs from purpura in being never attended with any febrile reaction"; and such was the distinction given me the other day by an eminent physician in the north. But Aitken, under the head of purpura, says (p. 820, vol. i): "To this class of cases, as a form of disease now under consideration, are to be referred those cases of profuse or fatal hæmorrhage from slight causes, recorded under the name of '*hæmorrhæa*', which have been ascribed to a diathesis termed *hæmorrhagic*, and which is supposed to be hereditary." Not finding any mention of the hæmorrhagic diathesis in the new *Nomenclature of Diseases*, I conclude that the College of Physicians takes the same view as Aitken, and considers this diathesis as a form of purpura; for, if it be not so, how can we register a death caused by hæmorrhage from a slight wound in this disorder? Congenital purpura, therefore, is the name which I will give the following interesting case—interesting as showing some of the consequences of injury in subjects of a hæmorrhagic tendency; merely remarking in contradistinction to Dr. Garrod, that purpura is "a disease not usually attended by fever" (*Nomenclature of Diseases*, p. 27).

The patient, who has been under my care upwards of two years, and whom I have had constant opportunities of observing, is a sharp little fellow of a fair, pale complexion, bright blue eyes, and thin transparent skin. There has been no enlargement of the glands of the neck, the muscles are soft and flabby, and the extremities at times cold and blue. His tongue is generally coated with a yellowish-brown fur, his appetite is good but capricious; his bowels are open as a rule after each meal. He is subject to oedema of the eyelids, to obstinate bleeding from trivial wounds, and his elbows, wrists, knees, and most frequently his ankles, swell at times to a considerable extent, and are very painful; this swelling usually continues a fortnight. Patches of ecchymosis appear also on the abdomen, thighs, and legs, and are seldom absent; it is not often that they can be traced to any injury, but they are attended with much debility, without febrile reaction. I have never been able to detect "an excess of albuminous matter, or a deficiency of urea in the urine" (Aitken, vol. i, p. 819). He is the youngest of a family of eight (four sons and four daughters). There is no hæmorrhagic history on either parent's side, except that the mother has suffered for some years from menorrhagia (*vide* Graily Hewitt, *Diseases of Women*, p. 52); the disorder has been developed in the three younger boys only, two of whom have died (aged 6 and 8 years) in consequence, having exhibited the same symptoms as described above. The eldest son (who was drowned at the age of 18) and the girls, though scrofulous, have never shown symptoms of this diathesis. I vaccinated the son of the eldest daughter, but no bleeding occurred.

Last Christmas, Mr. Walter Morgan and myself were called to see this boy, then four years of age. He had fallen against a bedpost and loosened three upper incisors, from around the roots of which blood began to flow incessantly. For three days, a fair trial was given to acetate of lead internally and externally, tannic acid, and perchloride of iron with pressure; but the gums became swollen and spongy, and the hæmorrhage did not abate. Mr. Morgan extracted the teeth and plugged the holes with lint soaked in carbolic acid, which stopped the bleeding for a few hours. It commenced, however, afresh; and, for six days, the thin almost uncoagulable blood trickled down the throat or out of the mouth. The stools were sanguineous. He lay in his mother's arms, most of the time asleep; when awake, his eye was remarkably clear and intelligent. His mouth became dry, stained and burnt with the styptics used. On the seventh day, when his skin had become cold and deathly white, his voice gone, and when, with the exception of administering a little brandy and cold water, we had given up all treatment as worse than useless, and we were momentarily expecting dissolution, the hæmorrhage ceased. Strength rapidly returned; in a few days the gums healed, and, in a week's time, he was able to go about.

On the 9th of September last, I was again called to the boy. He had fallen from a form in school twenty-six hours previously; there was a bruise over the left frontal eminence, but the skin was entire.

Blood had infiltrated the cellular tissue of the whole forehead and the eyelids; the latter were so puffed and distended that I found it impossible to see the left eye. The skin over the superciliary ridges and the right eyeball appeared natural. The eyelids had begun to swell nine hours after the injury. There were numerous small hæmic spots over the abdomen, a purple patch over the right hip, two inches in diameter, and several others on the legs. There was no pain or pyrexia. The treatment consisted of cold applications; fifteen grains of compound jalap powder, immediately; two drops of turpentine every six hours; low diet.

On September 10th, the eyelids were not so much distended. Ecchymosis extended above, among the roots of the hair to the coronal suture, and below, to the left ramus of the lower jaw. The turpentine was continued. On the 11th, he was able to walk about. There was pain over the left eye, which he could not open yet. The ecchymosis was extending into the left ear (helix) and neck. The swelling of the forehead was greater, and of a livid colour. Pressure was ordered to be applied, and the turpentine to be continued. On the 12th, 13th, and 14th, there was no further extravasation, and pressure was discontinued. On the 15th, he presented a peculiar appearance. The entire face was dusky blue. The outer half of the sclerotic surface of each eyeball was of a brilliant red colour (the blood having penetrated under the conjunctiva), the inner half remaining of a clear white. Iron was now substituted for turpentine. After this, absorption went on rapidly, and in two weeks there was very little trace of the injury. He is now in fair health.

With our present pathological knowledge, we cannot explain that peculiar condition of system which is characterised by purpuric symptoms, and which is manifested in various forms of disorder, ranging from a mere diathesis, or a non-febrile complaint, like what has been termed "*epidrosis cruenta*", to diseases accompanied by great constitutional disturbance, as cerebro-spinal fever; but I believe it will be found to be due, not so much to a morbid condition of the blood, or a defective state of the capillaries (Miller's *System of Surgery*, p. 231), as to some lesion or loss of energy of the organic nervous centres, induced sometimes by blood-poisoning. There are two curious facts observable in this case which, not improbably, may be owing to the cessation or elimination of a cause of vaso-motor palsy. They are:—

1. The stoppage of bleeding and rapid recovery after the patient had become, as it were, drained of blood. This, Dr. Allbutt tells me he has observed; and it has often occurred to the three hæmorrhagic subjects of the above family.

2. The duration of the purpuric symptoms for a fortnight. Miller describes similar symptoms as continuing the same time in the hæmorrhagic diathesis.

The therapeutic action of turpentine in arresting hæmorrhages and controlling some forms of inflammation, and its power as an antidote for phosphorus, are not improbably dependent on a stimulating influence which it may possess over the vaso-motor nerves.

CASE IN WHICH A PIN WAS SWALLOWED AND PASSED SAFELY THROUGH THE INTESTINES.

By GEORGE NEWSTEAD, M.R.C.S., Eccleshill.

ON the 6th of November, at about 8 p.m., I received an urgent summons to visit a child named Fawcett, aged 11 months, who was reported to have got a pin into his throat. The messenger informed me that he had seen the pin, and had made an unsuccessful attempt to extract it. I inferred, from the statement which he made to me, that the pin had been then resting obliquely across the fauces, with the head pointing downwards in the direction of the oesophagus. On my arrival at the house, the child's mother told me how the accident had occurred; and the manner of it was a singular one. She had taken the infant to her breast, having, at the time, the pin in her own mouth, from which it accidentally dropped and was received by that of the infant. The woman also mentioned that she had (a few minutes before my visit), at the suggestion of a neighbour, let the crying child have the breast, which it took greedily, and soon became perfectly quiet. I looked into the child's throat, in which I could not detect the presence of any foreign body said to have entered its mouth, nor could I (supposing it had been ejected therefrom), after very careful search round the place, discover its whereabouts. Under a strong impression, therefore, that the pin had really passed down the child's oesophagus, I requested the mother closely to watch for and examine the alvine evacuation. With a vigilance which no detective could have exceeded, Mrs. Fawcett appears to have followed my instructions; for, at the expiration of three days from the time of its being swallowed, the pin was found by her

among the fæces and brought to me. It was an inch and a half in length, the head being rather large and the point very sharp.

It is scarcely probable that I should have communicated this case had it not been that I desired to append to it an observation which might, I thought, possess a certain amount of practical value. I did not, although urgently requested to do so, administer to my little patient *purgative* or any other kind of medicine.

ON A PORTABLE SPIROMETER.*

By W. P. BAIN, M.D.

IN 1846 was read, at the Royal Medical and Chirurgical Society of London, a paper "On the Capacity of the Lungs and on the Respiratory Functions, with a view of Establishing a Precise and Easy Method of Detecting Disease by the Spirometer", by John Hutchinson, Surgeon.

This was one of the most brilliant papers ever read before the Society. The original views, the great research, the numerous observations, and the discoveries of the relations between respiration and the height and weight of an individual, and to health and disease, stamped the author at once as no ordinary man. An instrument which he invented—the spirometer—was one of his chief aids in these investigations, and he thoroughly established its value in the diagnosis of diseases of the chest.

His physiological views were very extensively adopted, and they are now standard in all works on physiology. But how have we benefited by these discoveries? In the treatises on medicine at this day, they seem to be entirely ignored. In Hoblyn's *Dictionary of Medical Terms*, the word "spirometer" is not to be found; neither is it mentioned by Sir Thomas Watson. Dr. Barclay's excellent work on *Medical Diagnosis* contains not a word on the subject. In one part of his book he says, "All true diagnosis is ultimately based upon inductions separately framed out of clinical and pathological investigations and experiments." And yet, while treating of phthisis, he passes over in total silence one of the most simple and accurate means of diagnosing this disease at its commencement, and ventures to say that "in its early stages accurate diagnosis is perhaps impossible with the aid of physical signs"—one of which physical signs, and perhaps the most important at this period, he entirely overlooks.

Dr. Guy, in speaking of respiration, treats very fully of the spirometer; and yet, when he treats on the diagnosis of phthisis, not a word is spoken of its great practical value. I believe, indeed, that the profession in general does not sufficiently prize the indications supplied by its use, for it is certain that the invasion of phthisis may be detected in this way long before it can be by percussion and auscultation. On this point Dr. Hutchinson, speaking of one of his cases—the American giant Freeman—states that, when he examined him during his "fighting condition", he found that his vital capacity was 434 cubic inches. Two years afterwards he came to town in ill health. "I then examined him", says Dr. Hutchinson, "twenty times at various intervals, during which his vital capacity varied from 390 to 340 cubic inches, and the mean of the observations was 344—a decrease of 90, or more than 20 per cent. At this time, I took him to two physicians well skilled in auscultation, and they both affirmed that they could not detect any organic disease." He became rapidly worse, and confirmed phthisis ended in death a year afterwards.

But it is not only in affording evidence in phthisis that the spirometer is valuable; it is also of the highest service in cases of a converse nature. What can be more satisfactory both to the patient and to the physician than to be assured thoroughly that in supposed cases of consumption there really exists no such disease? If, besides a favourable report of a patient's health through percussion and auscultation, the spirometer indicates that his vital capacity equals or exceeds the natural mean, a great additional testimony is afforded of his health, and an immense relief is given to his mind, while the physician feels doubly sure of his diagnosis.

It is possible that defects in the construction of the spirometers in use may have led to their not being employed so often as is evidently necessary. The bulk, the weight, the consequent want of portability, and general complex arrangements of stopcocks and valves, may have led to these results. In Dr. Hutchinson's, for example, the patient has to be educated, as it were, in its use. He has to be taught to turn the stopcock at the precise moment when he begins to expire, and to turn

it off again at the precise moment when his expiration ceases: a certain time is wasted in teaching this.

A simple and portable spirometer is much to be desired. As almost every one knows, Dr. Hutchinson's spirometer is on the same principle as an ordinary gasometer—one cylinder inverted in another which is partially filled with water. The smaller cylinder rises in proportion to the air which is blown into it, and the amount is marked by an index and a scale on the side.

Another instrument, sold by Mr. Coxeter of London, is of a more portable description. It consists of two air-tight bags joined by a stopcock, with another at each end. In using it, the intermediate stopcock is closed, and the patient breathes into the first bag. The stopcock at the mouth-piece is then closed, the intermediate one opened, and the air passed into the second bag, which is graduated so as to measure all the air that may be expired. This instrument, though apparently simple, has the disadvantage of three stopcocks and the repeated measurements.

Some time ago, it struck me that an instrument upon the bellows or accordion principle, having a graduated scale at the side, would fulfil all requirements. I found, however, that in practice it did not work well. One side would rise more than another, and the indications were therefore inexact. I then thought that, by fixing one end so as to form a kind of hinge, and allowing the other to be free, and making the body long and narrow, the rise would be more steady and uniform, and the scale have a longer sweep, so that it might be graduated with clearness. I have therefore had the instrument made in this manner—measuring twelve inches in length, six in breadth, and about two in depth: a graduated scale in brass, or a tap, is so placed as to indicate the amount of cubic inches expired. The weight of the top and bellows is counterbalanced by a spiral spring within the instrument, and no stopcocks are required to complicate the arrangements. It can be carried in the hand or under the arm like a book, and is, in every sense, simple and portable.

In experiments which I lately made on artificial respiration, I occasionally used one of these instruments, with satisfactory results. I found that it was very sensible, and easier in every way to manage, than other means—being portable, not requiring water, and the nuisance of valves and stopcocks being done away with.

In connection with this subject, I venture to lay before you a few practical remarks on the different modes that have been used for artificial respiration, in cases of asphyxia from drowning, poisons, gases, strangulation, etc., with a system of my own, which I believe to be simpler and more effective than any other.

The system of Marshall Hall was examined some years ago, by a committee of the Royal Medical and Chirurgical Society, and found not to realise the expectations that had been formed of it. The plan of Dr. Silvester was also tried by the same committee, and it was found that a considerably larger quantity of air could be introduced by it than by any other hitherto known, and it was accordingly recommended and adopted by the Royal Humane Society. It is so well known, that I need only say that its principle consists in causing the thorax to expand, by imitating the natural act of inspiration, by traction of the inspiratory muscles in raising the arms of the patient above his head.

Professor Mattei, of Paris, in 1867, brought before the Academy of Medicine of Paris, a method of inducing respiration in the newlyborn infant, during suspended animation. This consists in raising the infant by its shoulders and giving it some shakes, or "secousses", as he terms it. He did not, however, explain the rationale of the process, nor did he propose to extend it to the treatment of adults.

Another plan was proposed by the celebrated Pacini, of Florence, who advises that the operator should stand at the head of the patient, who is lying on a table. The head is then placed against his abdomen, the fingers passed behind the shoulders into the axillæ, and the upper portion of the trunk moved upwards and forwards, or towards the head of the operator. This plan is well thought of by its inventor; but, when tried in this country, both by myself and by others, has not given so good a result as Silvester's, whilst its performance is most fatiguing to the operator.

The method which I have discovered is founded upon that of Silvester; but whereas he adopts what I call a roundabout mode of acting on the chest, through the arms, I act immediately on it, by pulling the shoulders up at once, by the hands placed in front in the axillæ. It is three times more simple than Silvester's, as one movement only is required, instead of three, and the operator has not to bear the weight of the patient's arms, which, as he has to stoop over the body at the same time, involves immense fatigue, when his efforts are long continued.

* Read in the Physiological Section at the Annual Meeting of the British Medical Association at Leeds, July 1869.