epileptic affections; the difference between them and epilepsy being this, that in the latter the disturbance takes place in the cerebral circulation, whereas in the former it occurs elsewhere.

Symptoms analogous to those I have mentioned, and owning a similar pathology, are often met with in other organs; but it is my purpose now only to enumerate those which by a parity of reasoning may, I think, meet with a like explanation. They are, paroxysmal breathlessness; some pseudo-anginal attacks; vertigo; temporary amaurosis or deafness; and paroxysmal dyspepsia, vomiting, with sudden accumulation of flatus, and their concomitant and subsequent discomfords.

My object is to remove some of the alarm which is often felt upon the occurrence of the symptoms I have mentioned, by suggesting that they do not depend, as they have been commonly supposed to depend, upon disease of the great centres of innervation; but upon a change in that system of nerves which is the most liable to disturbance, and the aberrations of which are commonly the most amenable to treatment.

CASE OF IMPERFORATE ANUS,

IN WHICH THE RECTUM OPENED INTO, AND DISCHARGED ITS CONTENTS THROUGH, THE URETHRA, IN THE MALE.*

By HENRY DODGSON, M.D., Cocker-mouth.

ON December 19th, 1867, I was requested to see an infant that was said to have no outlet to the bowel. The child had only been born on the previous day, and nothing amiss was then observed with it; the attention of the attendant being first drawn to it, some hours after birth, from the circumstance of the napkins not being soiled. It was then found that something was wrong; and I was sent for.

On examination, about twenty-four hours after birth, the child was seen to be a well-nourished mature male, with no other abnormality than the entire absence of anus, and, perhaps, a slightly enlarged and inflamed state of the penis. The site of the anus was occupied by a slightly elevated ridge or raphe. Neither urine nor meconium had been passed; and the stomach rejected all food that was given. The retching and vomiting were apparently owing to the obstruction at the outlet of the intestinal canal. With a view to relieve this, an incision was at once made in the mesial line of the perinæum, immediately in front of the tip of the coccyx, to a depth of about half or three-quarters of an inch. No trace of rectum could then be seen, or felt by the finger introduced into the wound. An hour or two afterwards, the wound was enlarged and deepened, with the assistance and concurrence of my friend Mr. Whitehead, but without finding the rectum. As no urine had yet been passed, a small probe was introduced into, and passed along, the urethra, with a view of ascertaining whether the canal was pervious. It was passed nearly into the bladder, and could be distinctly felt by the finger in the perineal wound.

On the following day (the 20th), the child was in much the same state, the stomach still rejecting what little food was given. It had, however, passed urine. On examining it, along with my partner, Dr. H. Bell, the extremity of the penis was observed to be smeared over by a small quantity of dark brownish matter, resembling meconium. As it seemed probable that this had, in some manner, found its way into the urethra from the rectum, it was not thought advisable at that time to make any further attempt to establish an anus artificially by deepening the perineal wound.

From this time forward, an increasing quantity of semi-solid matter passed by the urethra; consisting first of meconium, but afterwards of feculent matter, resembling the natural evacuation of a child at that age. The urine was passed separately from the feces, and was quite natural in appearance. The vomiting subsided so soon as the contents of the rectum began to pass freely by the urethra. The infant, however, did not thrive, but became gradually thin and emaciated, losing all its former plumpness. This was, probably, in part owing to the mother not having sufficient breast-milk, so that it had to be fed artificially. Although it took a considerable quantity of food, consisting of cow's-milk diluted with water, and having a little sugar added to it, it continued to waste away until Jan. 25th, 1868, when it died.

POST MORTEM EXAMINATION, forty-eight hours after death.—The external appearance was that of very great emaciation. On opening the abdominal cavity, the intestines were found to be empty, or contained only flatus. Nothing unusual was observed in any of the viscera, except the rectum, which was considerably dilated. On carefully tracing it down into the pelvis, it was found to terminate in a rounded, somewhat bulbous extremity, without outlet, except that on its anterior inferior aspect, where it was contiguous to the urethra, there was a small opening com-

municating, by a very short canal of about the diameter of a crow's-quill, with the prostatic portion of the urethra. The urethral orifice of this canal was situate in the sinus pocularis or utricle, immediately in front of the caput gallinaginis.

REMARKS.—This case is remarkable in one or two respects. It is unusual for the rectum, in cases of imperforate anus, to terminate in the male urethra, though not so rare for it to open into the vagina in the female. The point at which the urethral orifice occurred is also worthy of notice; viz., the sinus pocularis, which is now recognised as the analogue of the uterus. Then, again, the case is remarkable from the length of time the child lived with this imperfect outlet to the rectum (thirty-seven days). But, though the orifice into the urethra was so small, it appears to have been sufficient for the requirements of the economy, for the symptoms of obstruction or strangulation subsided so soon as meconium began to pass by it; and the intestines were found empty after death. Had the child thrived and appeared likely to live, another operation would have been made for the purpose of establishing an artificial anus; as it was apparent, from the fact of the urine being passed separately from the feces, that the rectum descended low down into the pelvis, and opened into the urethra and not into the bladder.

ON THE IMPORTANCE OF OBTAINING CORRECT COMPARATIVE OBSERVATIONS

IN ESTIMATING THE INFLUENCE OF LIGHT IN HEALTH AND DISEASE: ILLUSTRATED BY THE ACTINOGRAPH.*

By HORACE SWETE, Esq., Weston-super-Mare.

WHILST much has been done in enabling us to register and tabulate correctly, the heat and pressure of the atmosphere, the quality and quantity of electricity present, the force and direction of the wind, and the amount of moisture and rainfall, there has little as yet been effected to provide us with reliable information as to the nature and amount of the chemical properties of light. The results of the observations of the meteorologists are of no small importance to the physiologist and pathological observer. Great strides have been made of late in statistical observations. The duration of life, the time of death, the rise and fall of the thermometer in the exacerbations and remissions of disease, have, in conjunction with the observations I have alluded to, thrown a new light on many points of interest in the study of disease. I need not take up your time when so many subjects of importance are being brought before you, by entering into any lengthened description of the effects of light on the human system.

We all appreciate the difference between the ruddy and healthy country children and those brought up in the close and crowded alleys of our cities, where frequently the only light they habitually enjoy is reflected, and not the direct sunbeam. The collier or the miner, working underground, may be recognised among his fellows at a glance; whilst in the vegetable kingdom we well know the effects of screening plants from the light. It becomes then a matter of no small importance to be able to register, as accurately as we can, the amount of heat or the pressure of the atmosphere, the daily amount of the chemical action of light; and it will be a matter of more than the common interest of curiosity if we can establish registers of comparison in different places so as to tabulate the amount of actinism in the crowded city, the wooded village, or the open seashore. I have endeavoured to construct an instrument to effect this purpose; though it may be considered as yet in an unfinished state, being only of home manufacture, or more properly, tinkering, and the results can only be received as an approximation to what may be done when the machinery is constructed with more mathematical accuracy. Still, I am anxious not to delay to place it in a more perfect state, but to bring it before the notice of this Association, in the hope of inducing some of our associates to work in unison with me in different localities; so that, during the ensuing year, we might collect some tabulated results which I feel convinced will ultimately be of importance, not only as an addition to the registers of other meteorological phenomena, but as throwing much light on the statistical study of disease, and especially on the value of our various health resorts.

And here I may remark the very great importance there is in having our instruments of observation self-registering. Machinery is less liable to err than the visual observation of different persons. Those of you who saw the interesting demonstrations of M. Marey on the Sphygmograph and Cardiograph, must have been struck with the accuracy of the observations; whilst the means taken in the complete and effective Observatory of this University to record observations by the photographic

* Read before the Cumberland and Westmorland Branch.

* Read before the Public Health Section at the Annual Meeting of the British Medical Association in Oxford, August 1868.

process, at once demonstrate the vast superiority of such means of self-registration over the former method of mere visual inspection.

I need hardly call to your minds the three-fold nature of the light we derive from the sun: the pure visual light, greatest in the yellow ray; the calorific part of light, greatest in the red; and the chemical or actinic effect, which is most intense in the blue. Nor is this three-fold nature only to be found in the different colours of the spectrum; it is also to be met with in the various times of its duration; thus, whilst the visual light is greatest at the meridian, the actinic predominates in the forenoon, and the calorific in the afternoon. These facts are frequently brought to our minds. The photographer obtains his most perfect results at 11, or thereabouts, in the forenoon; whilst the recent intensely hot weather has drawn our attention to the fact, that cases of sun-stroke have been most frequent from 2 to 5 in the afternoon. Dr. Aitken states that, out of sixteen attacks, ten were from 2 to 5 P.M. I have myself frequently observed, whilst exposed to the direct rays of the sun, on volunteer duty, that the most intensely hot day is comparatively bearable to 3 P.M., but at 4 or 5 it has been difficult to keep up. Now, time to us is only the angle or position in which we are placed as regards the sun. The light emanating from the sun I conceive to be always the same, the presence or absence of smoke, moisture, or impurities in our atmosphere, making the difference we find from day to day added to the sun's actual distance, owing to the convexity of our earth and the angle at which the sunbeam impinges upon it.

The chemical effects of actinism in oxidising metallic substances, and the daily improvements in the photographic art, have given us the means of estimating the amount of this quality in the light of the sun. Various actinometers have been devised for estimating the amount of time required to expose a salt of silver to produce a certain tone of colour; but, as yet, these have been of more use to the photographer than the meteorologist or physical observer. Observations to be of scientific value should be continuous and self-registering, and should also be capable of being taken with the same accuracy in different places, so as to shew comparative results; nor should any one set of observations be taken, or at any rate theorised on, alone. The variations of the thermometer and barometer, the nature of the clouds, and the amount of moisture and rain, are all necessary to be borne in mind in making any deductions of value as to the amount of actinism. Thus, the murky atmosphere of our crowded manufacturing towns, and the lurid clouds of an impending thunderstorm, might both shew in my instrument a considerable decrease of actinism; whilst the deduction to be drawn from that fact would be entirely different.

The instrument I have devised for providing us with a reliable record of the quantity of actinism present, I denominate the Actinograph, whilst to the results I have given the name of Actinograms. The one I shew you is of the roughest possible order, manufactured, or rather I should say tinkered up, at home, without any pretensions to mathematical accuracy; and the results, in a scientific point of view, are, therefore, of little value. I bring it before your notice to shew what may be done when I am able to perfect my design, and I will point out some of the fallacies which the observations at present taken shew, and the means which I propose to use to make the actinograph an instrument that I hope will form an addition to those already devised for the correct registration of meteorological and physical phenomena. I simply pass a strip of paper, already sensitised, across a chink of light, one-tenth of an inch at a rate of five minutes, so that every particle of the paper thus prepared is exposed for five minutes. To do this, the amount of paper ribbon required is rolled on a feeding wheel, passed under a friction wheel, and over a wheel driven by clock-work at a fixed rate of time, and covered with velvet so that the pressure of the velvet against the paper and the glass chink, forming, as you see, the cover of the apparatus, may at once give the motive power, and exclude light from falling on any part of the paper except that which is immediately under the chink of light. The paper then passes under another friction-wheel, and the slack is taken up by a wheel driven by a counterpoising weight. The whole instrument is fixed for observation on the top of a sentry-box, which contains the clock and weights, and, lighted by yellow glass, forms an useful photographic chamber for work. The roof of this box, and consequently the top of the actinograph, is placed where no artificial shadow either from chimney or trees can impinge upon it. The paper I use is the albuminised paper of Sax; the sensitising solution, that of simple nitrate of silver, marking 50 on the argentometer; the time of sensitising is ten minutes. The fixing solution, after exposure, is that of two ounces of hyposulphite of soda to the pint, which ought to be regulated by an hydrometer; and the amount of immersion ten minutes, after which the actinogram is placed in running water one hour, and dried. By adhering to these proportions and times, comparative results may be made from different observations. The actinograms thus prepared are eighteen to twenty-six inches long, according to the time of year; and,

when placed side by side, show, by the shades of dark and light, the amount of actinism present. The specimen I show you gives an idea of this; though, from the inefficient nature of the driving wheel for the slack, the results are jerky. This I propose to alter by connecting the supply and slack wheel together with a band, so that both shall be co-incident in their work. The divided slip shows the effect of the paper similarly treated for various periods of time, from thirty seconds to five minutes, forming a kind of test-tint.

The principal fallacies are the action of heat, I conceive, on the albumen, darkening the paper even in the absence of actinism. This may be made nearly *nil* by protecting the top of the actinograph by a non-conducting medium. Secondly, the jerky action of the driving wheels is evidently due to faulty construction. I propose constructing one on the horizontal principle, using glass and the collodion process, so that positives may be printed off such observations, if required. I do not anticipate much difficulty in combating the sources of error I see in the machine at present. I only wish I had had time to have done so before I came here.

And now, *cui bono*? Were the observations only made at one place, the results would be merely a matter of interest in determining the amount of actinism in the different periods. It is possible that, like the pressure of the atmosphere, a diurnal tidal wave might be observed. But I anticipate results of more importance to medical observers than this, and more particularly to those who make the laws of health and the bettering the condition of the poor their more especial study. Comparative observations may throw some light on the value of our health-resorts, as contrasted with the crowded city. At Weston-super-Mare there is, to the most casual observer, an amount of light, certainly of visual light, far greater than that of the neighbouring towns or even villages—partly due to reflection from the water, but, independently of that, to the freedom from cloud and mist; and this is, no doubt, the case in many other places. Whilst I had the good fortune to hear the able and deeply interesting papers yesterday read in this section by Mr. Rendle and Dr. Morgan, it struck me most forcibly that the appalling death-rate of which we heard when statistics were taken from the dwellings of the poor alone, and which I am quite prepared to endorse, (perhaps not to so fearful a degree, but still sufficiently to make us think deeply on this subject,) in Bristol and even the poorer localities of Clifton, where I have worked as parish doctor,—it struck me, I say, that, though very much is due to bad air and overcrowding, not a little blame may be laid to the score of the want of a due proportion of light; and what little there is reflected, and therefore in a state of polarisation. I am not prepared to say whether actinism is diminished thereby; but it will be an interesting subject for research. Under yellow glass, plants shoot up rapidly and weakly; vitality soon fails. A plant that, in the open air, would live two or three months, dies in as many weeks. In the courts and cellars of our towns, children are seen with big heads and small bodies; little shrivelled old men, precocious for the small span of their life, vitality rapidly failing. Is not this due in part to the want of actinism in effecting the vital functions of the blood, as the chlorophyll and other component parts of the sap cannot be properly elaborated under the yellow glass, where there is practically no actinism present? Englishmen have not now, as only a very short time back, to pay for the light of heaven in the shape of window-tax; but it may be well to consider how far it is well to sacrifice light to the ornaments of art and taste in building model cottages and almshouses with the lattice panes and cramped windows of a darker age. I feel convinced that not only do we want space for air and ventilation in any dwellings we construct for the better accommodation of the poor, but plain wholesome windows are a necessity; and, as a commercial speculation, they are far cheaper than bricks and mortar, to say nothing of the shadow-giving angles and dripstones of what an architect would call a well-broken building.

In bringing this subject before the notice of this Association, and especially before this section, I hope to see the good result of being assisted in these observations by others in different parts of the country. I shall spare no pains, during the remainder of the year, in bringing the instrument to a more perfect state and more easily workable condition; that should any wish to join me in observing, we may start in the beginning of the next year with every chance of having some results that may be of practical utility.

ABERDEEN NATURAL HISTORY SOCIETY.—The first meeting of the Society, for the season, was held in Marischal College, on the evening of November 17th. The following office-bearers were elected for the ensuing year.—President, Professor Nicol; Vice-Presidents, Dr. Ogilvie and Dr. Dickie; General Secretary, Mr. J. Roy; Secretary for Zoological Department, Mr. W. Stoddard Willis; other Members of Committee, Dr. Dyce, Dr. Struthers, Mr. Williamson, Rev. A. Beverly.