from the ear, and at the same time a puffy circumscribed swelling rose all over the temporal bone, and gradually extended both upwards and backwards to a considerable extent. As fluctuation was quite distinct behind the ear, an incision was made through the scalp down to the bone, which gave outlet to an immense quantity of sanious discharge of a dirty-red appearance and of intolerable fœtor. After this a large poultice was applied, which was constantly filled with the discharge. In about three weeks the discharge from the opening was very much lessened, but there appeared another swelling upon the occiput, just over the posterior fontanel, which burst of its own accord, and discharged a considerable quantity of sanious matter similar to the first. After these discharges the pain of the head considerably abated, and altogether the patient seemed quite relieved. The posterior opening always presented a very irritable appearance; and at last a piece of bone of a triangular shape, and about half an inch in size, was protruded from the wound. The exfoliation appeared to be from the internal table of the scull, as it presented a rough, convex surface, and a smooth concave one, bearing the impression of the meningeal artery.

After the swelling had subsided, I was surprised to find a prominent soft, defined tumefaction, along the tract of the whole lambdoidal and squamous sutures of the affected side, through which were felt the pulsations of the brain quite distinctly. And at the junction of the temporal with the parietal bone, the space was so large that the brain seemed to protrude to the extent of a large knuckle, and pulsated strongly; and when pressure was made on this part, the boy said he felt it through all his head, and that it made him sometimes stupid.

It was not until I discovered the above separation of the bones that I considered it to have been a case of acute periostitis, having merely thought it one of diffuse cellular inflammation, but the exfoliation of the bone and the total breaking up of the sutures gave me a view of the case entirely different. The boy is now in very good health, but the opening behind the ear is still discharging; and the separation of the bones, and pulsation of the brain through the fissure, are much the same as at the first.

ART. IX.—*Case of sudden and temporary occurrence of Presbyopia in a young Boy* By JAMES HUNTER, M. D.
Surgeon to the Eye Dispensary of Edinburgh.

THE patient in this case was a very intelligent boy, $9\frac{1}{2}$ years of age, the son of a pensioner living in the vicinity of Lasswade. He had been at school for upwards of three years, and was very

fond of his books. His sight began to fail about three weeks before I saw him, and was so much impaired in the course of four days that he could no longer see to read ordinary type with the naked eye. He had never had inflammation or other disease of the eyes, nor received any local injury that could have caused this affection. His general health had always been good, and he never felt better than at the time when his sight gave way. I examined his eyes minutely, but could detect no visible symptom of disease. There was no vascularity of the tunics; the size and shape of the pupil, the motions of the iris, eyeball, and eyelids, were perfectly normal, and he felt no pain or uneasiness. He could see distant objects as well as ever, but near ones appeared very indistinct. With the naked eye he could read print of this size, [DISPENSARY], but could not make out the letters in a type of the same size as that used in printing these pages. In examining a small object, he required to hold it at a considerable distance from the eye, so as to obtain greater distinctness.

When he put on his father's spectacles, he could read the smallest type with perfect ease, but distant objects seen through them appeared obscure. The spectacles from which he derived so much assistance were fitted with convex glasses of nine inches and a half focal distance, and they suited him so well that he used them for reading his favourite books, ever since he had discovered their power of improving his sight.

To ascertain with more precision the nature of this affection, I constructed an Optometer on the principle of the one invented by Dr Porterfield. * I took a slip of stiff white pasteboard, fourteen inches long, and one inch and a half wide, and drew down its middle a fine black line, extending the whole length of the slip: at half an inch from one end I made two pin-holes, one on each side of the line, and about one-eighth of an inch from each other, and then folded up about an inch of the slip of pasteboard at this end, so as to make a right angle with the rest of it. When this instrument, laid on a stiff book to prevent its bending, is held to the eye, so that the observer looks at the line through the two pin-holes in the doubled up part, he will see two lines in place of one. These two lines are not parallel, but inclined so as to intersect each other; the degree of inclination and position of the point of intersection varying with the focus of the eye. To a myopic eye, where the focus is short, the inclination of the lines will appear greater, and the point of intersection placed nearer the folded up end of the instrument, than to an eye of an ordinary power of vision; whilst to a presbyopic eye, the point of in-

* Porterfield on the Eye, Vol. i. p. 434. Edin. 1759. The Optometer, as improved by Dr Young, is described in the Bakerian Lecture for 1801, and also in Rees' Cyclopaedia in the article *Optometer*.

tersection will appear very distant, or the lines may incline so slightly as not to cross at all.

Having prepared my Optometer, I made one or two preliminary experiments with it on eyes of ordinary power, and caused the observers to mark with a pencil the point of intersection. I then made the patient use the instrument, and tell me what he saw. He at once said he saw two lines that crossed each other. I put a pencil in his hand, and told him to mark the point where they crossed. He immediately did so, and the spot marked was three inches and a-half beyond the place where the crossing appeared to those who possessed an ordinary power of vision. I repeated this experiment many times with the same results, and ascertained that both eyes were equally presbyopic. In some of these experiments there was a slight variation of half-an inch in the position of the pencil mark, it being sometimes a quarter of an inch nearer, and at other times a quarter of an inch farther off. This arose from the difficulty of determining the exact point of intersection of two lines so slightly convergent, that, at the crossing, the one line lay as it were on the top of the other for about half an inch. After this I made the boy repeat the experiment with his father's convex spectacles on, and tell me what he saw. He said he saw two lines, as formerly, but much more distinctly; and on bidding him mark where they crossed, he immediately pointed to a place within a quarter of an inch of the very spot indicated as the point of intersection by those whose eyes were of ordinary power. This was repeated several times, and on both eyes, and always with the same results. I then made him put on spectacles fitted with concave glasses of six inches focus, and look through the pin-holes in the Optometer. He said he saw two lines as before, but very indistinctly; and although they came nearer to each other they did not meet or cross as formerly. To guard against any deception, I made various trials, using one while a convex glass, and at another time a concave one, without the boy's knowledge; but the answers he gave were always in perfect accordance with the principles of optics.

I ordered his bowels to be freely moved with rhubarb and calomel, and if any worms were observed in the evacuations, that he should get a dose of turpentine in castor-oil; this to be continued at intervals of two days till all the worms were brought away. If there was no appearance of worms in the evacuations, and if the complaint still continued, I recommended that he should have an aperient of senna and sulphate of magnesia twice a-week, along with a rather spare diet, and active out-door exercise; to be kept from school, and on no account to use spectacles. Six weeks afterwards his father called on me, and said, that exactly three weeks after I had seen him, the sight began to improve, and in the course

of two days was quite restored. The medicines I had prescribed acted freely on his bowels, but no worms were observed. He had returned to school, and could now see to read, without the assistance of spectacles, as well as before the occurrence of the disease.

Although cases of *Presbyopia* in children are mentioned by writers on diseases of the eye,* it is a very rare complaint, being seldom met with in persons under 40 years of age. In *Presbyopia* the point to which the rays proceeding from near objects would be converged is situate behind the retina, and therefore the images of near objects formed on the retina are not sharp and well-defined; but the rays from distant objects, being less divergent, are more easily refracted by the humours of the eye, and are brought to a focus just at the retina, so as to give a clear and distinct picture of the object. The proximate cause of *Presbyopia* may be either a shortening of the antero-posterior axis of the eyeball; a diminution in the refracting power of one or other of the humours of the eye; or an inability to effect the change (whatever be its nature) in the position or curvatures of the transparent media, required for the accommodation of the eye to distinct vision at different distances; so that the eye, after being exercised on a distant object, cannot make the change necessary for the distinct vision of a near one.

The experiments with the Optometer do not lead to any certain information as to which of these states existed in the eyes of the boy whose case has just been related. They merely show that the indistinctness of vision was caused by the rays from near objects being converged towards a point not at the retina, but at some distance behind it: but a consideration of all the circumstances of the case may help us in our conjectures as to its proximate cause.

Against the idea, that the *Presbyopia* in this case arose from shortening of the antero-posterior axis of the eye, caused by the pressure of tumours, or the effusion of fluids in the orbit, it may be urged,

1. That the retina continued perfectly sensible, as shown by the distinctness with which distant objects were seen, as also near ones, when the eyes were assisted by convex glasses; whilst in cases where the axis of the eye is shortened by pressure in the orbit, there is usually more or less insensibility of the retina caused by the degree or inequality of the pressure.

2. There was no unusual projection of the eyeballs.

3. The motions of the eyeballs were unimpaired, and there was no strabismus.

4. The two eyes were equally and simultaneously affected;

* Mackenzie on Diseases of the Eye, article *Presbyopia*. Ware, Phil. Transactions, Vol. ciii. 1813, p. 48.—Rosas of Vienna and others.

which is not likely to have been the case had the *Presbyopia* been caused by pressure in the orbits.

To have determined if the refractive power of the humours of the eyes was diminished, could have only been done by making the patient repeat the very difficult experiments performed by the late Dr Thomas Young on his own eyes, as recorded in his Bakerian Lecture for 1801; but this was impossible with the very young boy whose case forms the subject of this paper; and, indeed, they cannot be tried by any one who is unacquainted with the science of Optics, and even then are very difficult, and I could not have checked the results. But as in the present case, there was no flattening of the cornea; and as it is rare to find any sudden change in the density of the humours which shall affect both eyes equally and simultaneously, it is not likely that a diminished refracting power of the humours was the cause of the disease.

All things considered, I think the best explanation of this case is to suppose that there was some derangement of the mechanism by which the eyes are accommodated to the distinct vision of objects at different distances. When the eye is turned from a distant object to the contemplation of a near one, a short interval elapses before the latter is seen distinctly; this interval being occupied in the adjustment of the focus of vision. During this process the only visible change is a slight contraction of the pupil; but all physiologists agree that some other change must take place. The lens must either become more convex, or move forwards, or the antero-posterior diameter of the eyeball be lengthened, or the cornea become more prominent, or perhaps there is a combination of all or of some of these modes of adjustment. As all the above actions imply a power of contraction and relaxation in certain internal structures of the eyeball, it is very probable that the movements of these parts should at times be subject to derangement from spasm or from over-relaxation, in the same way as other organs endowed with a contractile power; and therefore, I think it not unlikely that, in the present case, the eyes had temporarily lost the power of changing from the state necessary to fit them for the distinct vision of distant objects to that state required for the distinct vision of near ones; but whether that change is to be regarded as a *contraction* of certain parts, such as the ciliary ligament, as some suppose, or the fibres of the lens, as believed by others; or in a *relaxation* of these or other parts, cannot be determined in the present imperfect state of our knowledge of the exact manner in which the eye is adjusted to distance. This view of the case is supported by the following circumstances.

1. The affection and recovery of the two eyes were simultaneous and equal, as might be expected if the *Presbyopia* depended on a spasmodic derangement of their adjusting apparatus, which,

being destined to act simultaneously and equally in health, is likely to be similarly affected in disease.

2. The vision of distant objects was perfect, and near objects were seen quite distinctly with convex glasses; showing the sensibility and other functions of the retina to be unaltered, and that the cause of the disease was one that did not interfere with the functions of the eyes, excepting by depriving them of their power of adjustment to distance.

3. Other cases of the sudden occurrence of Presbyopia in young children have been traced to the existence of various disorders, such as intestinal worms, epilepsy, and diseases of the brain or spinal chord, all of which are known to be frequently accompanied by spasmodic affections of different organs.

The treatment of the present case was very simple; but I would call particular attention to the necessity in all similar cases of strictly prohibiting the use of spectacles in the first instance, for they can always be resorted to at an after period should the affection prove a permanent one; and I have but little doubt that, if the wishes of my patient had been complied with, and he had been allowed to continue to use his father's spectacles, the Presbyopia would become a confirmed disease.

May 16, 1839.

ART. X.—*Cases of Scarlatina, with Observations on the Nature and Treatment of that Disease.* By WILLIAM CULLEN, M. D., Cupar-Fife.

DURING the whole of the winter of 1838–9, scarlet fever has prevailed in this town and neighbourhood; and the district to the south-east between this place and the coast has been visited with it very generally. Its diffusion has been slow, but this is one of the most curious circumstances of the disease. A great proportion of the cases have terminated fatally, which is my chief reason for writing on the subject. In the village of Kilconquhar nine have died out of eighteen or nineteen who were seized. About Colinsburgh and the Largoward district it has been equally fatal, there having been in some families three or four deaths. And in the united villages of Elie and Earlsferry, about one-half of those seized have died. In this town and immediate neighbourhood, the mortality has likewise been great. Thus its destructive nature makes it a subject of deep interest, as scarlet fever has not heretofore been always considered a dangerous disease.

At first sight it may be doubted whether this disease is not the *cynanche maligna*, as this latter affection sometimes makes its appearance as an epidemic; but from all the instances that have