functions than the merely mechanical ones of antagonising each other, giving to the animal the power to move the globe of the eye in all directions, and of maintaining, by a nicely-balanced pressure, the tension of the ball necessary to distinct vision. These questions cannot be altogether satisfactorily solved. That in passion the eyes seem ready to start from their sockets, is a common observation. That this is caused by an undue action of the oblique muscles seems to me equally manifest. That the violent action of all the muscles during passion alters the form of the eyeball, magnifies objects, and renders vision double and obscure, requires neither experiment nor reasoning to demonstrate its truth, the facts being matter of common observation. But, why are the eyes occasionally turned up on the approach of sleep, not merely in man, but in some of the lower animals, the dog, for example? And why do they turn up in hysterical women, and in children with excitable nervous systems? And, finally, why do they turn up, as has been said, on the approach of death? These questions, we shall find, have never yet been fairly met. I must, first, take leave to enter my formal protest against the assertion of some distinguished physiologists that the oblique are involuntary muscles, and that being so, the ball of the eye on the approach of sleep, (the recti, as *voluntary* muscles, at that moment losing their influence), is, as it were, handed over to the exclusive action of the oblique muscles, which then preponderating direct the pupil of the eye upwards, and inwards, beneath the upper eyelid, and that the same phenomenon takes place on the approach of death. I must here positively declare that after many hundred observations made particularly in hospitals (where such opportunities of observation are, unhappily, but too frequent), I have never seen, but in a few nervous and hysterical women, and in a very few children, the eyes turned upwards on the approach of sleep or death; and in the many hundreds of brave men I have seen die in foreign and domestic hospitals, I never once observed such a phenomenon. Instead, then, of this appearance being constant, or even of frequent occurrence, it is, on the contrary, exceedingly rare. In respect to the lower animals, I have never observed the eyes to turn up on the approach of sleep, excepting in the dog; and unless from wounds of the brain or spinal chord, the eyes never turn up as death approaches, but remain generally fixed, with the pupil directed forwards.*

Neither physiology, then, nor anatomy, as yet offer any rational explanation of the

causes why certain passions give a peculiar direction to the eyes, any more than to the hands or trunk; nor can any reason calculated to satisfy a thinking person, be assigned why so many nerves should proceed to the orbit, and some be distributed solely or chiefly to particular muscles. As to the theory of an excellent mechanical philosopher (Mr. John Russell), that to the oblique muscles of the eyeball must be assigned the function of the adaptation of the eyes to varying distances;—to this theory I need not reply; it is based on a mode of reasoning which, however sound it may be in general physics, is altogether inadmissible in physiology. Mr. Russell's *argument* (for it merits no other name) is, that as no *other use* can reasonably be assigned to the oblique muscles, their action must necessarily be that assigned by him, viz., the adaptation of the eyes to varying distances. But I was not aware that such a mode of reasoning had been admitted in natural philosophy or in mechanics; it seems rather to belong to that wordy division of human knowledge (?), logic. The *argument* would look better and fresher in the hands of a college wrangler, with whom words and sophistry stand in the place of facts and common sense, and to whom the deduction from the premises is everything, the premises themselves nothing.

(To be continued.)

CEREBRAL AND SPINAL PARALYSIS COMBINED.

To the Editor of THE LANCET.

SIR:—Hoping that the attention which is now directed by the scientific members of the profession to the doctrines of muscular irritability in paralysis, will form sufficient excuse for troubling you with the annexed case, which has been, and still continues, under my care, I remain, yours obediently,

C. H. ROGERS HARRISON.

18, Southampton-street, Fitzroy-square.

R. B. P., Esq., of gouty diathesis, and apoplectic tendency, was suddenly seized, on the 21st of February last, with giddiness in the head, and failing to reach the wall for support, fell heavily in the street, and struck his head against the flag-stones on the right antero-lateral portion. He was taken up insensible and conveyed home. When I saw him, within an hour (5, P.M.), his symptoms were, complete paralysis of the left side and partial of the right lower extremity; the right pupil contracted to the light, the left one remained immoveable, and dilated; the left angle of the mouth was drawn down; the hearing on the left side gone, and the sterno-cleido-mastoides and scaleni muscles of that side violently con-

* The eyes of birds frequently turn upwards when they die from an injury done the brain, but death from other causes does not give rise to this appearance.

tracted; breathing heavy and laborious, with slight stertor; pulse full, and struggling, and 104, although he had been cupped to sixteen ounces a few minutes before I saw him. Venesection of the arm, to sixteen ounces, was employed, and a strong mixture of Epsom salts, senna, and jalap, given every two hours. 10 o'clock, P.M. Pulse quiet, and 80; medicine not operated; continue it.

22. 8, A.M. Remains the same; no effect from the medicine. Ordered one drop of croton oil in a pill, to be taken directly. No urine having passed a catheter is introduced, and about a pint of thick, high-coloured, strong-smelling, water is drawn off; still remains insensible. 8, P.M. No improvement; and the medicine not having had the wished-for effect, an enema is administered, containing Epsom salts and jalap, which, after being contained about an hour, produced six or seven consecutive involuntary evacuations; the urine also passed involuntarily; but the patient has so far recovered his senses as to ask for his hat and spectacles, which had come off in his fall.

23. 8, A.M. His remembrance quite restored, and talks of the events which immediately preceded his attack; complains of great pain in the left arm and foot, but has not the slightest power of motion. Quietness only enjoined. 8, P.M. Complained of distracting pains in the head; pulse 110; is very restless. Venesection to 16 ounces. Ordered,—

Calomel, 5 grains;

Acetate of morphia, a quarter of a grain.

A pill, every sixth hour.

24. Left pupil sensible to light, but vision much impaired; pains in the left arm and leg tormenting.—Omit last evening's medicine, and give, instead, one drop of croton oil.

25. Passed a restless night; pain in the head severe; pulse 70, and sharp.—Repeat the blue pill and morphine every four hours. Fæces and urine pass involuntarily.

26. Pulse accelerated; attributed to the effect of the mercury, which is omitted; pain in the head continues; quotes long passages from the plays of Euripides, the *Iliad* of Homer, and *Inferno* of Dante. Excoriation of the skin on the left trochanter, left external tuberosity of the femur, and outer ankle of the same side.—Omit all medicines, and recommend quiet.

27. Pulse nearly natural; head much relieved; use of the right leg quite restored; sloughy appearance of the skin covering the left trochanter. Apply a little spermaceti and a soft dry pad. Still displays surprising powers of memory, and speaks of himself with great interest. Fæces and urine pass involuntarily. No medicine.

March 5. Has remained in much the same state as last report, only that the sores have healed kindly. Broth diet.

Strychnine, one-sixth of a grain;

Calomel, 1 grain.—One pill thrice a day; and tartar emetic ointment to be rubbed along the spine until pustules appear.

9. No visible effects from the medicines ordered above, which he has continued to take, so discontinue them; pulse 80; no pain in the head. Diet the same as before.

11. Pulse 88, and rather full; the bowels not having been opened for two days, ordered,—

Extract of aloes, 5 grains;

Powder of scammony, 5 grains; with enough of Venice turpentine to make two pills.

12. Noon. Pain in the head returned; pulse 120. Venesection to twelve ounces; repeat the pills; omit the broth. 10, P.M. Much relieved from the morning's treatment, yet complains of pain in the paralytic arm and leg; vision not much improved.

13. 9, A.M. Passed the easiest night since first ill; contraction of the neck on the left side given way; has an idea he has caught cold, and has rheumatism in the left arm and leg, on account of the pains, which are severe, in the ball of the great toe. Ordered beef tea.

20. Continues improving; has taken an occasional pill, as prescribed above; pain in the head entirely gone; hearing on the left side slight.

27. Still improving in health; but has now well-marked gout in the left hand, and feels the pain severely; has not the least power of moving, as, when requested to do so, his endeavours terminate in moving his right hand and muscles of his face impatiently.—Ordered 15 grains of soda three times a day.

28. Finger-joints of the left hand inflamed and swollen, and painfully tender to the touch, whereas the arm is not susceptible to the impressions of pinching and biting.—Continue the soda, with the addition of six grains of rhubarb to each. Fish diet. Pulse 75, and rather small.

April 8. Greatly improved in general health; pulse 70; gout still continues, although inflammation and swelling have nearly subsided. Yesterday (7th), for the first time, twitched up his left leg on the excitation of tickling the sole of the foot; angle of the mouth brought to its straight line.

10. Bowels being confined, ordered two of the aperient pills prescribed on the 12th March.

11. Urine passes freely, but bowels remain confined; pulse 80.—Repeat the pills, to be followed by a draught of salts and senna, if not effective in six hours. Pain in the head makes him restless.—Omit fish and beef-tea, and take warm gruel.

12. Mid-day. Bowels not acted upon,—

Ordered one grain of croton oil, to be repeated in four hours, if not previously relieved. 8, P.M. I was sent for, in great haste, to see the gentleman, who, I was told, was dying, and when I saw him he was in the most profuse sweat I ever witnessed; it ran from his head and face in streams. Inspiration was long and heavy, expiration short and sharp; pulse barely perceptible, and very rapid, at least 140; perfect sensibility of the sensorium, and felt quite resigned to his fate, which not he alone thought was nearly closed. A teaspoonful of brandy was instantly administered, and repeated at intervals until his pulse increased in volume and decreased in number. A powerful enema was then given, as well to clear the bowels as a precaution against too great reaction in the circulatory system.

13. Passed a tolerable night; no return of the palpitation; bowels continue acted upon, but passed *with* knowledge; pulse steady and good; slight voluntary movement is perceptible in the left leg; complains of the feeling of pricking in the paralysed hand and arm; gouty affection of the finger-joints going off.

14. Improving; pulse 60, and small. Half meat diet.

15. Had a slight remission of the palpitation. Ordered friction over the precordial region with tartar emetic ointment, and an aperient draught to be taken occasionally.

25. Has continued improving in general health.

28. Convalescent; his present condition is, vision greatly improved, as also the hearing; tongue clean; has very slight command over the left arm, more over the left leg; excretions natural, with the occasional help of medicine; no pain in the head; pulse 70, and easily excited.—Ordered quiet, and generous diet.

OBSERVATIONS.

The above case appears to offer one or two points of practical importance in respect of nervous influence on muscular action and muscular irritability.

If we look minutely into the case we shall find that here we have a combination of what Dr. Marshall Hall calls cerebral and spinal paralysis, inasmuch as the former accounts for the hemiplegia and diminished irritability; and the latter, paraplegia and increased irritability of the rectum and urinary bladder. Following up the record of the case, we find that the first thing complained of (when the sensorium had recovered its function) was excruciating pain in the hemiplegic hand, arm, and leg; pain not accompanied by muscular irritability, for although he had not the power of volition over the paralysed limb, yet sensation was acute. Now, as the motor nerves of muscles are not susceptible of intense pain

(if any), we must infer that the nerves of sensation coming from the roots which were affected, and the nerves of volition neither increased nor diminished in irritability; and if this be true, then we have sensation preceding volition, and, consequently, must look elsewhere for the doctrine which gives volition the precedence of sensation.

As to the paraplegia, which, after the indefatigable investigator, Dr. M. Hall, I venture to call spinal paralysis, we find *no* pain, nor yet power of volition, consequently, the nerves of sensation not diminished or increased in influence, but the nerves of volition diminished at first but afterwards increased.

Again, the exhibition of strychnine threw no light upon the subject, as it had no visible effect upon *any* muscular fibre, whether paralysed or not, in this instance; although it may be said it was not given to a sufficient extent to produce irritation.

The kindly healing of the sores occasioned by wet and continued position of the limb, shows how the vital principle of regeneration was as active as in a healthy limb, and the subsequent exhibition of gout proves that paralytic limbs may become the seat of disease common to healthy parts, an instance of which I heard a short time ago, where a perfectly paralysed limb was broken, and united by bone, the patient experiencing no pain during the operation of new growth.

DISEASES OF THE SPINE.

To the Editor of THE LANCET.

SIR:—I was pleased to see in *THE LANCET* of the 20th inst. the "Substance of a Clinical Lecture on Curvature of the Spine, by Frederick Hale Thomson, Esq." It is a subject to which the attention of the profession may well be especially directed; anything, good or bad, which may be the means of exciting that attention, must be productive of benefit, and, therefore, it is that I venture to solicit, in your pages, a place for this communication.

The treatment of distorted vertebral column (as Mr. Thomson justly observes), has remained unaltered from the days of Galen until now. Quiescence, recumbency, and counter-irritants formed the staple of Galen's treatment, and such has been the treatment adopted by most of his successors down to this day, and inclusive of Mr. Thomson himself. It is certain, however, that very many, before Mr. Thomson, have insisted earnestly upon attention to the general health; and there is no name more justly celebrated in that respect than that of my late instructor and friend Mr. Abernethy. I think the lecturer in error, however, when he states that "the first step of the treatment