and directions promulgated by him for observance in military hospitals, as respects the separation and the properly placing of the sick, the application of acids, since so generally introduced into practice, for purification of the air, and the numerous other benefits he conferred on the service, rendered him an object of royal distinction, and brought his name into general esteem. During the temporary cessation of the war he resumed his professorship at Berlin; but, on its renewal, returned to his former position and rank in the military service, and devoted himself with the same unremitting application and success as before. Gräfe, in the year 1814, after the establishment of peace, visited Paris, and met with a reception from many scientific bodies of the most gratifying description. He received, about this time, decorations from William IV. of Prussia, as well as most of the sovereigns of Europe; and Blücher, as well as other famous generals, wrote letters, expressing their approval and esteem towards him for the manner in which he had performed the duties of his appointments during the war.

It will not be a matter of surprise that, with the experience and merited reputation thus obtained, Gräfe's professional career afterwards in Berlin should have been one of unprecedented success in the attainment of practice and wealth. He was frequently consulted by many royal families, and among others by those of the King of Hanover, the Grand Duke Constantine, that tyrannical governor and oppressor of his brave countrymen the Poles, and the Grand Duke Michael. Gräfe was a Knight of the Guelphic Order by George IV., and Commander by the King of Hanover, on whom he operated successfully for cataract. He was, in 1826, proposed by the Senate of Warsaw as a Knight, which title was recognised by the King of Prussia. In the year 1817, Gräfe published most valuable annual clinical reports, which were continued till the period of his death. In 1818 he published a treatise, and proposed improvements on the Taliacotian operation. Few who have read this work, and have witnessed his operations, but will appreciate its value and utility. In the year 1820 he took part in editing the well-known *Journal of General and Ophthalmic Surgery*. In 1831, Gräfe received great commendations for the active part he took during the prevalence of cholera at Berlin. Gräfe, as well as most of the eminent practitioners in Berlin, formed from their experience most decided opinions that cholera was not contagious, and recommended to government the abolition of the quarantine laws. Many of the pupils of this distinguished man are now occupying the first places in several of the universities, and are a testimony to his noble and scientific exertions. Louis Biermowski, professor of the University of Cracow, has published a collection of some of his operations. Gräfe,

as are most of the Poles, was a great linguist. He died in Hanover, where he had proceeded to operate for cataract on George, the Crown Prince of Hanover. He had acquired in practice immense wealth. His loss is universally deplored, and his fame immortal.

36, Manchester-street, Manchester-square,
Nov. 13, 1840.

* * * The writer of the above memoir is already favourably known to the profession, as the author of several practical papers which have appeared in the pages of this *Journal*. Fired with enthusiasm in the cause of Poland, Mr. Bullen was among the first of the young medical men in this country to devote his services to the unfortunate Poles. He was appointed, in the spring of 1831, assistant-surgeon to a cholera hospital, and, successively, surgeon to the military hospital of Ujazdoff, in Warsaw; surgeon to General Rozyccki's regiment, and, at the siege of Warsaw, surgeon-general of Krukowiecki's staff. On his return to England, Mr. Bullen was appointed by Lord Auckland and the Government one of the inspectors in the North of England and Scotland during the prevalence of cholera there; and his treatment of that disease was recorded as eminently successful in the various towns in which he was stationed. Mr. Bullen became first acquainted with Gräfe in consequence of being seized with a severe typhus fever, produced by the privations and difficulties which he encountered at Warsaw, and the harassing Prussian quarantine to which he was subjected on his return to Berlin. During his subsequent stay in Berlin, he had frequent opportunities of observing the uprightness of character, the nice discrimination of disease, and dexterity in operation, for which Gräfe was so justly celebrated.

OBSERVATIONS

ON THE EFFECTS OF DIVIDING THE TENDONS OF THE VARIOUS ORBITAL MUSCLES IN ANIMALS.

By E. W. DUFFIN, Esq., Surgeon.

IN order to aid me in deciding on the best mode of remedying certain untoward events that occasionally supervene after the performance of Dieffenbach's operation for the cure of strabismus, I undertook a series of experiments on animals for that purpose. The results of these inquiries, though not so

satisfactory as might be desired, still present facts of considerable practical importance, worthy of careful consideration.

In conducting the experiments to be presently detailed, I may state that I was favoured, on different occasions, with the assistance and judgment of Drs. Marshall Hall and Child, and of Messrs. Samwell and Farquhar, surgeons, as well as with the opinions of various non-professional friends, who, being totally ignorant of the nature of the investigation, and consequently unprejudiced in favour of any cherished theory, or anticipated results, were the more likely to take an unbiassed view of the phenomena that they witnessed than we ourselves, who, it may be presumed, could scarcely avoid entertaining preconceived notions.

Before detailing the facts that presented themselves to our notice, it may be premised that great difficulty was experienced in performing the experiments with sufficient accuracy and care to insure the complete division of what was required, and, at the same time, to confine the operations precisely within that limit.

All experiments of the operative kind on the orbital muscles of animals, in order to ascertain their respective functions, must, on several accounts, prove more or less unsatisfactory. The anatomical adaptation of the powers which move the eyeball in brutes, differs materially from that observed in the human species.

In animals there exist certain additional muscles and appendages to the eye, which modify the operations of the simple mechanism possessed by them in common with man. Thus animals are furnished with a muscle denied to man, the *suspensorius*, by which they are enabled to retract the eye in a most remarkable and powerful manner.

The principal object of this muscle seems to be to assist in retaining the eyeball *in situ*, and to obviate any inconvenience, or bad consequences, that might result from the long-continued dependent position of the head, during the time that the animal is feeding, which, in *ruminants*, engages so considerable a portion of the twenty-four hours.

In this class of animals, therefore, we find the suspensorius muscle not only powerful, but very large and funnel-shaped, so as to completely and uninterruptedly embrace the posterior half of the eyeball, and thus most effectually to accomplish this apparently important end. In *carnivorous* animals, whose time is not so much occupied in feeding, and whose heads, therefore, are not so constantly in a depending position, the suspensorius muscle is not so powerful or comprehensive. On the contrary, it is divided into distinct parts, forming, in fact, four independent fleshy slips, which have a common origin, but are inserted into the sclerotic by separate tendons reaching to the greatest transverse diameter of the eyeball, and passing between

the attachments of the four principal recti muscles. The oblique muscles also, in ruminating and carnivorous animals, differ from each other in many respects. In the latter class, and in man, the *superior* oblique becomes tendinous immediately before it reaches the pulley affixed to the orbital angle of the frontal bone, and continues its tendinous form, from this point of reflexion, to that of insertion into the sclerotic coat; whereas, in ruminants, the reflected portion of this muscle forms a second fleshy belly of considerable thickness and power, which again becomes tendinous before its final insertion. The part of the eyeball into which this muscle is inserted, does not precisely correspond with the same portion in man; the insertion of the tendon being a little nearer to the cornea in animals. The *inferior* oblique, likewise, in animals, is a much stronger, more fleshy, and abrupt muscle, than it is in man, in whom its insertion is much more extensive, and effected by means of a stronger and more spreading tendon.

When any attempt is made to injure the eye of an animal, the suspensorius, or more properly the *retrahens* muscle, immediately draws the eyeball back into the orbit, and, in doing so, still further protects the organ, by causing the immediate and forcible advance of the *membrana nictitans*, which unfolds and spreads itself like a curtain over the fore part of the eye.

In experimenting on the internal rectus and oblique muscles in particular, this membrane is a source of great difficulty and embarrassment to the operator, as it not only comes constantly in the way of his instruments, but prevents the observer, after the desired end may have been accomplished, from ascertaining the precise direction in which the pupil is drawn, when the eyeball performs any rapid or involuntary movement, such as may result from slightly irritating the cornea with a feather, or the like.

In all the movements of the eye, indeed, that are not voluntary on the part of the animal, difficulty is experienced in making allowance for the influence of this suspensorius, as any portion of it appears to be capable of being called into play, to the exclusion of the rest of the muscle, especially in animals of the carnivorous tribe, in which, as just explained, it is divided into four distinct auxiliary recti muscles. Thus, if the adductor draw the pupil towards the nasal canthus of the orbit, and the inner portion of the suspensorius or retrahens, co-operate with it, the effect is much heightened by the inner portion of the eyeball being at the same time drawn back towards the origin of this auxiliary muscle; and the same is the case when any of the other three recti are forced into involuntary action. Could a series of experiments be performed on any of the ape tribe, the orbital muscles of which class of animals resemble in every particular those of the

human species, we might possibly arrive at better and more satisfactory conclusions. But even then we should have to contend with another difficulty, that equally opposes our inquiries when experimenting on a class of animals inferior to this, viz., the want of that intelligence which distinguishes reasoning beings.

We cannot, of course, when a muscle is divided in a brute creature, estimate the result in all its bearings, as in man, by requiring the animal to move the eye in such directions as would aid our judgment, and satisfy us that specific results have been attained, and certain objects accomplished. On the contrary, the only conclusions we can arrive at must be deduced from a comparison of the movements of the two eyes, when, by stratagem, we can excite the natural contractions of certain muscles in the organ that has not been the subject of operation. If, on inducing special movements in the sound eye, we find that those of the other organ do not correspond, we may fairly conclude, if they were previously complete, that the power of producing them has been destroyed.

Notwithstanding all these obstacles, however, a few plain and incontrovertible facts do present themselves, which are of sufficient practical utility to merit careful consideration.

The first experiments that I shall relate were instituted with a view to ascertain the results of dividing the several recti muscles. And it may be presumed that they afford a tolerable criterion of the results we might expect to occur, were the corresponding tendons divided in the human species; provided the muscles were in a healthy condition, and the eye not in any way affected with strabismus.

EXP. I.—*Division of the Internal Rectus.*

The tendon of the adductor of the left eye, of a middle-sized, half-bred spaniel dog, was carefully separated from its attachment to the sclerotic. The pupil was instantly directed permanently towards the outer angle of the orbit, and to such an extent that, next day, fully one-third of the cornea was concealed from view. The animal appeared to be wholly incapable of disengaging the pupil from this situation; nor did he acquire the power of doing so in the slightest degree afterwards.

EXP. II.—*Division of the External Rectus of the same Eye.**

In the course of a week from the performance of the above operation, the *external rectus* of the same eye was divided, but without producing any sensible alteration in the position of the eyeball; the pupil still continued

to be everted, and partially concealed in the temporal angle of the orbit.

From these facts we may conclude, either that the muscle had not had time to form a reunion with the sclerotic coat, or that the eyeball having been so long unremittingly turned outwards, the reunion was established too far posterior to the original insertion to enable the muscle to invert the pupil again.

EXP. III.—*Division of the External Rectus Muscle alone.*

The abductor of the left eye of another dog, similar in size to the last, being carefully divided, the pupil was permanently turned inwards towards the nasal canthus of the orbit, *but not quite in so great a degree, as in the first experiment it was turned outwards.* Nor did the animal, in this instance, apparently possess any power to dislodge it from its unnatural situation. This we ascertained, in both experiments, by holding its head in a particular position, and then calling the attention of the animal to the opposite direction. On such occasions the intact eye alone obeyed the summons of the will; the other did not move in unison with it.

From the three foregoing experiments, which were afterwards several times repeated, and farther verified in the course of operating on other animals, we may infer—

That, when all the orbital muscles are in a *sound and healthy* condition, if we divide either the adductor or abductor, the natural tendency of the antagonist muscle is to contract in the fullest degree of which it is capable; and that, in doing so, it will produce a deformity of the eye similar to that which characterises ordinary internal or external strabismus;* with this difference, that the movements of the eyeball in the direction of the cut muscle will be wholly destroyed. When, however, we divide the adductor in the human eye, for the purpose of remedying strabismus, we very rarely find that the pupil is drawn outwards beyond the visual axis of the orbit. Hence we may conclude that, under such circumstances, the eyeball is either prevented from turning outwards by some retaining adventitious cause, independent of the contracted adductor, which, after its section, no longer offers any opposition, or that the external rectus has been previously partially paralysed, as supposed by Mr. C. Guthrie (vide his report). These facts, moreover, point out the propriety of not only satisfactorily ascertaining that the eye is affected with *confirmed* strabismus previous to operating, but, at the same time, warn us of

* This experiment, though performed a week afterwards, is detailed here, as being connected with the former one.

* If this result be the general law when the orbital muscles are divided while in a healthy condition, then some of the arguments adduced, in a former article, to explain why the pupil does not usually turn outwards after the operation for convergent strabismus, fall to the ground.

the troublesome, if not unfortunate, consequences that may possibly result from immediately dividing the adductor tendon in the second eye, *when not in any way implicated*, as proposed and practised by Mr. Elliot, of Carlisle, should the section of the tendon of the faulty organ not prove *instantly and completely* successful.*

Another inference to be deduced from the foregoing fact is, that the oblique muscles take very little part in the lateral movements of the eyes.

When the internal rectus was divided, the obliques did not enable the animal to approximate the pupil at all to the nasal canthus of the orbit; neither did they, on the other hand, contribute the power of everting the pupil, when the external rectus was divided, unless in a very trifling degree; since it will be observed, by reference to the third experiment, that the pupil was not proportionally so much *inverted* when the external rectus was detached, as it was *everted* on the division of the internal muscle. This difference in the degree of displacement of the pupil may have been attributable to the combined action of the two obliques, if their actions be in any way calculated to aid that of the external rectus, as was supposed by Albinus, and is still maintained by Sir Charles Bell, Dr. Marshall Hall, and others. The power, therefore, that many patients possess of turning the pupils slightly inwards after the adductor muscle is divided, we may presume to be dependent much more on the acquired influence of the inner fibres of the superior and inferior recti, than on the action of the oblique muscles. Hence, also, another argument in proof of the doctrine which I have already advanced, that division of either of these latter muscles can never be requisite in the cure of convergent strabismus.

But a practical question of much importance suggests itself for our consideration in reflecting on the foregoing facts, viz., When the pupil is very much everted on dividing the internal rectus—so much so, I mean, that we are satisfied time will not rectify the position the eye has assumed—ought we to wait, before cutting the tendon of the abductor, until reunion shall have taken place between that of its antagonist and the sclerotic, or ought we at once to perform this second operation?

When such an event takes place, i. e. when the pupil is everted in a remarkable degree, I apprehend that the case is one in which the strabismus had been primitively produced by *spasm* of the inner rectus; and that the external muscle, being in a healthy condition, was capable of its fullest degree of contraction. Were we to wait in such case, it is possible that the abductor might form a reunion too far behind its original insertion to be able to restore the pupil to the axis of the orbit, when

the abductor tendon should be afterwards separated. If, on the other hand, we do not wait, we have seen that the eye will, in all probability, not be restored to its normal position, while both muscles are equally incapable of action, but that it will retain the position in which it was placed by the first operation. This *permanent* state of eversion, however, is a circumstance that, it would seem, does not occur in the human eye under the circumstances we are considering. However much the external rectus may contract after the adductor has been cut across, in a *strabismic* eye, the patient always possesses the power, when the eye is used *in conjunction with its fellow*, of bringing it to the central point between the inner and outer angle of the orbit, although at such moments the axes of the two eyes do not correspond, and vision is consequently double. If, however, a case were to present itself in which the pupil should be permanently turned outwards after the division of the adductor tendon, and the patient did not possess the power of removing it from this position, it occurs to me that we should gain nothing by waiting until the inner tendon was reunited, and that it would be better to divide the outer muscle at once. It is possible in such case, were the eye liberated, that the superior and inferior muscles might rectify the morbid position of the pupil. A case parallel to that just supposed, it will presently be shown, has actually occurred with regard to the superior rectus in the human eye.

From the foregoing experiments we should naturally expect that similar phenomena would attend the division of the superior and inferior recti; but such is not the case.

EXP. IV.—*Division of the Inferior Rectus.*

In this instance the tendon of the inferior rectus was separated with great care;* the animal lost completely all power of directing the pupil downwards, when that of the other eye was depressed; but it was not drawn upwards, as was expected, by the action of the superior rectus. Three days afterwards, however, it was found to be displaced in this direction, the upper third of the cornea being concealed under the superior palpebra, which situation it continued to occupy.

EXP. V.—*Division of the Superior Rectus.*

The superior rectus of the left eye of a middle-sized dog was separated from its insertion; the position of the pupil was not altered, although it appeared that the animal could not direct the eye upwards.

EXP. VI.—*Division of the Inferior, Internal, and Superior Recti.*

This experiment, as will be immediately shown, was performed for a special purpose.

* These dogs were in general afterwards killed, within an hour or two, and care was always taken to ascertain that the proposed object had been accomplished.

* Vide LANCET, Oct, 31, 1840.

The inferior rectus was first detached, then the adductor, and finally the superior muscle. The pupil at first preserved its natural central position, but in the course of two days afterwards was found to be directed outwards, and very slightly upwards.

My object in performing this experiment was to ascertain whether, when the internal rectus has been divided to remedy strabismus, and the pupil is drawn upwards under the superior palpebra, in consequence of the deformity having arisen from *paralysis* of the inferior rectus, any benefit would be derived from dividing the superior muscle. From the result of the experiment, and the experience of two cases of this description which I have met with, it appears to me that the operation would be useful *after the adductor tendon has become reunited to the eyeball.*

EXP. VII.—*Division of all the Straight Muscles.*

In this experiment all the straight muscles were detached; the pupil remained fixed in the visual axis of the orbit. When irritated, the eyeball was retracted, and the *membrana nictitans* was suddenly spread over the forepart of the eye at the same moment, so that it was quite impossible to decide what influence the oblique muscles exerted, or whether they produced any special movement at all. It was clear, however, that they neither drew the eye towards the outer nor the inner angle of the orbit. Hence I am disposed to imagine, as already stated, that when both of these muscles contract together, they tend to steady the eyeball in the visual axis of the orbit, and contribute to modify the focus of the eye by compressing the sphere. They are, in such case, opponents, though in a slight degree, of the external rectus.

EXP. VIII.—*Division of the Superior Oblique and Internal Rectus Muscles.*

The greatest difficulty was experienced in performing this operation satisfactorily, in consequence of the retraction of the eyeball, and the protrusion of the *membrana nictitans*. A sharp-pointed bistoury was introduced at a right angle to the tendon, and about midway between the trochlea affixed to the frontal bone, and the insertion of the muscle into the sclerotic. The instrument was pushed sufficiently deep into the orbit, to secure the cutting of the tendon on its being withdrawn with the point in contact with the roof of the orbit. There could, therefore, be no doubt that the tendon was divided. No apparent change occurred in the position of the pupil; nor could we perceive that the movements of the eyeball were in any way modified, or destroyed, by the operation.

The insertion of the internal rectus of the same eye was next separated from the sclerotic, and instantly the eyeball protruded *considerably*, and the pupil, dilated in a most

extraordinary manner,* was drawn diagonally outwards and upwards, as if by the equal co-operation of the outer fibres of the superior rectus, and the upper fibres of the external, or abducens, muscle. The eyeball afterwards retained this position, and when the muscles were sympathetically irritated to involuntary contraction, by gently touching the cornea, was always retracted by the action of the retrahens. On such occasions, the upper and outer portion of the sphere appeared to be the part most retracted; the lower and inner portion being, at the same moment, made to advance obliquely, and project in a remarkable manner.

EXP. IX.—*Division of the Internal Rectus and Superior Oblique Muscles.*

In the ninth experiment, the foregoing operations were reversed on another dog: the section of the internal rectus was first performed, then that of the superior oblique muscle. The results were similar to those just related. The eyeball was directed outwards and upwards; its anterior inferior surface was brought into view, and considerable protrusion took place, accompanied with remarkable dilatation of the pupil. When the internal rectus alone was divided in this experiment, as in No. 1, the pupil was turned directly outwards; but, when the superior oblique was cut across, its direction was found to be outwards and upwards. This diagonal direction of the pupil, then, in the two last experiments, although such as might be presumed would be produced by the equal co-operation of the external and superior recti muscles, I am inclined to attribute, in a great measure, to the uncounteracted action of the inferior oblique, since it was exactly what might have been anticipated from the direction of the fibres of this muscle, and did not become *diagonal* until the sec-

* Slight temporary dilatation of the pupil often supervenes in the ordinary operation for strabismus, on dividing the internal rectus, especially in those cases in which the eyeball becomes somewhat more prominent immediately after the operation. But when, in an animal, either of the oblique muscles is cut across, the enlargement of the pupil is very considerable. The iris contracts into a fine circular band, not above half a line or a line in breadth, and the eye presents an appearance very similar to that produced when the animal is poisoned with prussic acid. We should naturally imagine, as the pupil dilates when the eyeball is compressed, and contracts again when the pressure is withdrawn, that liberating the sphere, by cutting a portion of its attachments, would give rise to contraction; but the contrary is the invariable result. It may be presumed, then, that when the eye protrudes, the remaining recti muscles, being stretched, compress the sides of the globe.

tion of the superior oblique had been performed. Be this as it may, the other result, viz., great projection of the lower portion of the eyeball, so that the anterior part of its under surface was brought into view on slightly depressing the lower eyelid, could be attributed to no other cause than the contraction of this muscle when unopposed by the trochlear.

Exp. X. and XI.—*Division of the Inferior Oblique and Internal Rectus Muscle.*

These experiments were conducted in a similar manner to the two last related, and the section of the former muscle, the inferior oblique, was accomplished on the same principle as had been that of the superior oblique; the bistoury being withdrawn with its point in contact with the floor of the orbit. The results which succeeded were very similar to those we had already witnessed. The eyeball protruded as soon as the adductor was cut across, but not before; neither did it project in so great a degree as in the former experiments. The pupil was directed outwards, but not upwards; and in this situation it remained immovably fixed.

Most of the foregoing experiments I have repeated several times, and uniformly with the same results; the degree in which they manifest themselves, however, being various in different animals.

On one occasion, when assisted by Mr. Samwell, on dividing the superior oblique, the pupil was drawn so forcibly towards the outer canthus by the action of the external and superior recti muscles, that, had it not apparently been for the restraining power exerted by the inferior rectus on the lower portion of the eyeball, it would have wholly disappeared.

What, then, are the functions of the superior oblique muscles? So far as may be inferred from the foregoing experiments, very little of a conclusive nature can be deduced.

It certainly appears somewhat paradoxical, and irreconcilable with a first view of the subject, that dividing one of two muscular powers, which both tend, though perhaps in different degrees, to bring the eyeball forwards in the orbit, should be a means of causing it to advance still more, even to protrusion; yet such would appear to be the fact. If we reflect on the course and insertions of these two muscles, we shall perceive that, when they act singly, it is probable they antagonize each other in the *semi-rotatory* movements of the eyeball; and that when they contract at the same time, they will co-operate in drawing the eyeball forwards in the orbit, but *without causing it to revolve in any direction*. On the contrary, they will steady it; and, as the origin of both of these muscles is from the nasal side of the orbit, they will fix the globe of the eye in the visual axis when we look steadfastly at an object placed immediately before us, and at the distance from the eye at which we can

see it the most distinctly; i. e. at the true focus of the organ—this being the position in which the exertion of a steady power is of the most importance, and that which is the most frequently exercised of any. If, moreover, the focus of the eye be ever changed, so as to suit it to the various distances at which we survey objects, these muscles, it appears to me, may be very powerful agents in accomplishing this purpose, by compressing the central portion of the sphere slightly between them, and against the cushion of fat which lines the nasal surface of the orbit; thus not only increasing the distance between the cornea and that portion of the retina on which the image is depicted, but also rendering the cornea itself more convex. The importance of steadying the eye, under particular circumstances, against any inadvertent contraction of the recti, and of accommodating its focus to view objects at various distances, is too obvious to need any comment; and I think we shall, on reflection, be inclined to admit that the same end could not be so efficiently attained by any combination of agency on the part of the recti muscles. When the trochlear muscle contracts, and the inferior oblique is relaxed, it appears to me that the effect will be to slightly rotate the eyeball downwards and inwards; and that when the lower muscle contracts, the upper one being at the same time relaxed, the effect will be to cause the eyeball to slightly revolve inwards, i. e. towards the nasal canthus, and upwards.

But we have seen that there was reason to believe that the inferior oblique aided the external rectus—a view that was taken of its actions by Albinus, and is still maintained by Sir Charles Bell, Dr. Marshall Hall, and others. Certainly, if we consider the direction of its fibres, and the extreme point of their expanded insertion, reaching nearly to the optic nerve, we can scarcely avoid arriving at this conclusion also—viz., that when left free to contract, as it especially is, if the tendon of its antagonist be divided, it will direct the pupil outwards and upwards, and thus assist the external rectus. But not so the superior oblique; at least certainly not in so great a degree. Its insertion, which is by a round tendon, does not usually extend more than two lines beyond the central diameter of the sphere;* neither does it, in so

* In most works on anatomy we are informed that the insertion of the trochlearis does not extend beyond the great diameter of the eye. But this, it would appear, is not correct. I have of late dissected a number of eyes for the purpose of ascertaining this fact, and have, in every instance, found the insertion to be posterior to the greatest diameter of the eyeball. In a preparation now in my possession, the ultimate fibres of the tendon are inserted more than three-eighths of an inch posterior to the central diameter of the sphere.

great a degree, transversely embrace its circumference. To me it appears probable that this muscle, *when both obliques are entire*, can only assist the *internal* rectus, while the inferior one may aid the *external* muscle in certain compound movements of the eye, the nature of which we at present know little or nothing about.

But there is a practical inference to be deduced from the foregoing facts, of considerable importance.

If the eyeball be protruded in the manner we have seen it may be, when either of the oblique muscles is divided in animals furnished with a suspensorius or retracting muscle, how much more might we fear it would be so, were the same operation practised on man, to whom this muscle is denied.

Presuming this extension of the operation for the cure of strabismus to have been attempted with impunity, it appears to me unnecessary to offer any comment on the propriety of farther inquiry before it be repeated.

14, Langham-place, Regent-street,
Nov. 19, 1840.

ON THE PROPER MODE OF TREATING THE INSANE.

By ARTHUR STILWELL, Esq., Surgeon.

To the Editor of THE LANCET.

SIR:—Every one interested in the welfare of the insane, must have watched with anxiety the controversy that has been carried on in your excellent Journal, regarding the possibility and propriety of abolishing all instrumental means of restraint, in the treatment adopted for their restoration to health. Many and able have been the disputants *pro* and *con*.

I feel, Sir, in entering on an inquiry of this kind, that our only desire should be to get at the truth, and that we should not commence our labours with a previous determination to arrive at any particular conclusion. Our only object, the benefit of our afflicted fellow-creatures, in what way their unfortunate situation can be most alleviated, and their recovery, when practicable, the most speedily effected; I am sorry to see angry feelings excited by such a subject. It must be recollected, that experiment must decide the question after all, and not declamation. Our judgment ought not to be too strongly biassed by our disapprobation of the conduct of those who have chained, nay I fear who do chain, their fellow-men to the walls, to their beds, or to their chairs,—conduct at once disgusting to humanity and disgraceful to a Christian country.

Neither in our abhorrence of the atrocities committed under the name of restraint, by unfeeling and ignorant men, should we

hastily assert, restraint however mild, is *never* required in the management of the insane, or we shall, I fear, too late repent our rashness. The opponents of the non-restraint system are many and watchful, and every error committed by its supporters will be sent forth to the world with pleasure. The case of Miss A, reported from the Lincoln Asylum, is a case in point; no sensible man can for a moment deny that this patient was grossly mismanaged, or that she would not sooner have recovered from her maniacal attack, had she been properly controlled. That those who now confidently assert that restraint is *never necessary*, will meet with cases, sooner or later, that will induce them to modify their opinions, I feel assured from practical experience. But it does not follow, because it cannot at all times be entirely dispensed with, that people are justified in the unnecessary barbarities, so feelingly related by Sergeant Adams to the Middlesex magistrates, and so justly reprobated by him.

Because I thus express my humble opinion, that restraint cannot always be discreetly abolished in the treatment of the insane, do not let me be supposed as advocating it, in the slightest degree, as a punishment for any intemperate acts a patient may be hurried into, during a paroxysm of excitement. Nothing can possibly be more unjust, than to punish man for the committal of acts, when by the dispensations of Providence, he is deprived of the control of his own actions. On the contrary, whatever degree of excitement the patient may be temporarily labouring under, I believe seclusion, and the kind yet firm conduct of the attendants, will overcome it. How often have I seen in these cases the proverb verified, that “a soft answer turneth away wrath.”

Nor do I advocate restraint as a direct remedy for mental disease. Whoever employs it as such, knows little about the matter. For what then do I deem it desirable? Simply to preserve the bodily health of the patient, to confine him occasionally to his bed during the necessary periods for rest, or to prevent his injuring himself and others. I would have it used, as in the delirium of fever, to prevent persons committing acts which in their lucid moments they would regret. I cannot perceive that there is any humanity in allowing a maniac to injure himself, or his bodily health, and thus throw away all chance of recovery, indeed I do not think it acting with justice towards him. To illustrate what I mean, by preserving the bodily health of the patient by restraint, I will suppose the following case to occur. I have seen many such, and so must every other medical man who is engaged in the treatment of insanity. A delicate female is subject to maniacal excitement during the appearance of the