Surgeon Royal. 1829

A REVIEW

OF THE

DIFFERENT OPERATIONS

PERFORMED ON

THE EYES,

FOR THE

RESTORATION OF LOST AND THE IMPROVEMENT OF IMPERFECT VISION;

IN WHICH

THE MOST JUDICIOUS AND SUCCESSFUL METHODS OF OPERATING ON THESE ORGANS ARE DESCRIBED, AND THE GENERAL CAUSES OF FAILURE FAITHFULLY DELINEATED.

ALSO

A FULL ACCOUNT

OF THE VARIOUS

STRUCTURES AND DISEASES OF THE EYES AND THEIR APPENDAGES;

TOGETHER WITH THE NECESSARY MODE OF TREATMENT:

THE WHOLE BEING THE RESULT OF SEVERAL YEARS EXTENSIVE PRACTICE IN THIS IMPORTANT DEPARTMENT OF SURGERY.

By WILLIAM CLEOBUREY,

MEMBER OF THE ROYAL COLLEGE OF SURGEONS, LONDON, AND ONE OF THE SURGEONS OF THE RADCLIFFE INFIRMARY, OXFORD.

LONDON:

PRINTED FOR THOMAS AND GEORGE UNDERWOOD,

32, FLEET-STREET.

MDCCCXXVI.

PREFACE.

An enthusiastic love of my profession, and a sincere desire to alleviate the sufferings of human nature, have induced me to print the following pages. The style I have adopted in the narration of facts is simple. I have not indulged in idle theories; but the matter I present to my professional brethren is purely practical, and therefore may be relied on. I have but little claim to genius, but if the devotion of the principal part of my life to an arduous and laborious profession, will entitle my opinions to any respect, then I presume I may claim some degree of attention; and I trust that under Providence I may be the instrument of aiding the exertions of some of the gen-

tlemen of my profession, who have had less experience in this important department of surgery than myself: and the consciousness of the purity of my intentions in this undertaking, will, I feel, render any attacks of the illiberal against me unavailing.

Oxford, 1825.

CONTENTS.

OPERATIONS ON THE EYES,

&c. &c.

IN the following Observations, it is my intention, in the first place, to take a candid and impartial review of the different operations performed on the Eye, for the restoration of lost, and the improvement of imperfect, vision. The only apology I shall offer for so doing, is, that I conceive it in some degree my duty from the experience I have had, to publish the result of it for the benefit of others*. More than this I shall not attempt, and I hope to be pardoned for the freedom with which I may be induced to express myself on the pro-

* The original manuscript of this work was much more extensive than the one from which this was printed; but as I am one of those who consider a great book a great evil, I have contracted it as much as possible.

priety or impropriety of any operation, or of its superiority or inferiority, as far as regards its reference to the peculiarity of the case. To trace the different operations to their exact origin, and to ascribe to each individual his due degree of merit, would be a difficult and almost impossible task, notwithstanding the assistance that may be derived from the numerous publications both ancient and modern that are extant; but I will endeavour to render to each gentleman the praise due to his inventive faculties; and I trust, that any omissions or misrepresentations that may perchance appear in this work will be overlooked.

In the early period of my practice, though familiar with the different authors who have written on diseases of the eyes, and acquainted with the various operations usually performed on those organs for the restoration of sight, I have frequently been at a loss to determine what operation was most applicable to the peculiarity of the case, and consequently most certain of obtaining the object in question. Experience

has in a great measure taught me this, and I conceive it one of the most important steps towards the success of an operation, to determine on that particular one best calculated for the purpose; I have witnessed an operation elegantly performed, fail from want of attention to this circumstance; and I have known another in which no particular adroitness was displayed, succeed from giving this point its due consideration.

A state of doubt previous to an operation, distracts the head and embarrasses the hand, and no operations require so much calmness and composure of mind, united to steadiness of hand, and exquisite delicacy of touch as those of the eye; and should these observations prove serviceable in assisting the judgment and relieving the doubts of the junior members of the profession, the object of my wishes will be accomplished.

The four principal operations performed by modern surgeons for the restoration of sight, are,—First, depression of the opaque lens, commonly termed couching, from the

French word *couchant*, setting or lying down. It consists merely of a change of situation; the opaque lens being removed from the axis of vision to a different part of the globe. This operation is supposed to have been invented by Celsus, who lived in the reign of Claudius Tiberius at the time of our Saviour, and is taken notice of by Boerhaave as follows: Ars hæc quam vetus sit, patet ex libro Aurelii Celsi, cap. de suffusione. Hanc operationem idem tam exacte descripsit, ut hodie nihil addi possit. Hanc autem artem ex Ægypto ad reliquas gentes fuisse delatam probari videtur ex illo, quod in ea regione ex centum hominibus, vix 50, vigessimum quintum assequantur annum quin cataracta laborant, quod ipsis præ aliis occasionem dederit, de mediis excogitandis pro morbo sanando.—BOERHAAVE, *de Morbis Oculorum*. Secondly, Extraction of the opaque lens, which consists in removing it entirely from the globe of the eye through a section of the cornea. This operation was invented by Freytag in the seventeenth century, and was brought to perfection by Daviel.

Thirdly, The rupture of the capsule and division of the opaque lens, thereby exposing it to the solvent power of the aqueous humour, and thus subjecting it to the process of absorption, which process is supposed to be considerably expedited by projecting it into the anterior chamber; this operation was well known to, and frequently performed by Mr. Pott.

Fourthly, The formation of an artificial pupil, when the natural one becomes obliterated from disease; an operation first suggested by Cheselden, and afterwards brought into notice by Sir William Adams. This is effected by a division of the fibres of the iris, which may be performed in various ways; or by detaching it from its connexions with the ligamentum ciliare. To these should be added, the anterior operation first suggested and performed by the late Mr. Saunders for the cure of congenital cataract; this is accomplished by introducing a needle through the cornea, puncturing and destroying a portion of the anterior capsule of the lens, and leaving it to be dissolved or absorbed in situ. In

addition to these there are a variety of operations, all of which are compounded of an union of the foregoing.

The first in order for my consideration, is depression of the opaque lens: this in every sense of the word is an imperfect operation; imperfect as regards the certainty of its execution, since if the lens is soft it cannot be depressed, and if depressed it will frequently rise again, either immediately or at some subsequent period; the rising of the lens after depression is generally produced by irritation excited by it, as a foreign body on the exquisite sensible retina, and vascular choroid coat, which has the effect of producing a spasmodic action in the voluntary muscles of the globe, thereby exciting them to restore it to its natural situation.

The circumstance of the opaque lens rising again after depression, is so frequent, that when I have been compelled to perform this operation, from the peculiar structure of the organ rendering extraction inadmissible, I have invariably exposed the eyes with fear and trembling for the issue.

Imperfect, as regards the organ as an optical instrument; the size of the lens bears a relative proportion to that of the eye; the expansion of the retina extends to the very edge of the circumference of the lens: the lens when depressed will be deeply imbedded in the substance of the vitreous humour, and situated upon or over the delicate retina and choroid, consequently a portion of the retina corresponding in size to the lens will be annihilated or neutralized; and as it will be readily admitted, that every portion of the retina is absolutely necessary for distinct vision, the organ, from the unnatural situation of the lens, will be rendered more imperfect as an optical instrument*.

Imperfect; from the iris being incapable of performing one of its most important functions, namely, the dilatation of the pupil; for it will generally be found in those cases in which the operation has suc-

* In those eyes which have been examined after depression, the vitreous humour has been found red and thin, and its cells broken down in the neighbourhood of the lens.

ceeded, that the pupil will be permanently contracted; which is occasioned by the chronic inflammation or irritation, produced by the lens on the choroid coat. The probable, and indeed the most rational conjecture of the use of the iris, is, that by its office of dilating and contracting the pupil, it enables the organ to adjust itself to distance; for it will be found that the more distant an object is situated, the greater will be the degree of dilatation of the pupil, and the nearer the greater the contraction; though this will depend in some measure on the size of the object; hence if a certain number of objects be placed at different distances, it will not be difficult for an accurate observer to distinguish at which object an individual is looking merely by observing the state of the pupil. Is it not rational then to conclude that the optical properties of the organ will be injured by one of its principal functions becoming materially impaired?

Imperfect in its ultimate result; for too frequently a species of chronic inflammation succeeds this operation, which gra-

dually though imperceptibly produces total disorganization of the component structures and humours of the eye, which terminate in the fading or loss of sight.

In consequence of the discrepancy of opinions as to the superiority of extraction or depression, I resolved to extract the lens from one eye, and to depress it in the other, the result of which will be seen in the following cases :—

Case I.

Samuel Ing, ætat 40, or thereabouts, who had been blind twelve years in consequence of a cataract in each eye, applied to me for assistance; I extracted the lens from one eye and depressed it in the other: both operations succeeded, but one left the organ much more perfect than the other, for with the eye from which the opaque lens had been extracted, he could see the minutest objects without the assistance of glasses; but with the other, objects though visible, were much more indistinct, and the pupil was permanently contracted.

Case II.

Mrs. East, of Bicester, ætat 50, who was blind for several years from cataracts in each eye, applied to me for relief.

I extracted the opaque lens from one of her eyes, and depressed it in the other, as in the former case.

The result was exactly similar; with the eye from which the lens had been extracted, she could see to read her bible; with the other, vision was much more indistinct, and the pupil was permanently contracted.

Case III.

A boy, from the neighbourhood of Fairford, was afflicted with cataracts, which I operated on in the same manner; extracting the lens from one eye, and depressing it in the other. The result was the same. The eye in which the lens was depressed was imperfect. But he could see objects so distinctly with the other that nothing escaped his observation.

I should but weary the reader by relating more cases of this description. It will be sufficient for me to observe, that I continued to adopt this practice till my own scruples were completely satisfied; and if it were of any service, I could adduce numerous additional cases to prove the result was always the same.

In these cases, it must be admitted that there is nothing left for the theorizing cavilist to object to; for each respective operation was perfectly accomplished; at the same age of the individual; subject to the same constitution, and in every respect under the same circumstances.

The old operation of couching is almost invariably adopted by surgeons residing in the country, who constantly advocate its practice; but the number of disappointed patients who have undergone this operation, and who, I may say, annually present themselves to me, would sufficiently convince any accurate observer how inadequate this operation is to the object in question. Some of these patients suffer under the remains of inflammation, (with

its effects, contracted pupil and effused lymph), which has deprived them of rest ever since the operation, and almost worn them out; and which going on to the formation of matter, renders it absolutely necessary to evacuate the whole contents of the globe, in order to give relief*. Some with opaque lenses remaining unabsorbed in situ; or so partially absorbed as to admit a few rays of light round their circumference; of so little service to the patients, that it merely enables them to distinguish day from night, and to amuse themselves with the shadow of their fingers,—others with entirely obliterated pupils,—others with disorganized vitreous humour, its cells being broken down, and its colour changed, and with the opaque lens dancing up and down in it; all being perfectly blind, as if no operation had been performed.

I am perfectly aware that the advocates for depression of the opaque lens will ob-

* In one instance, where the lens was depressed, the inflammation ran so high, that it terminated in the patient's death. This is the only case I ever knew terminate fatally.

serve that it will afterwards become absorbed, but the following case convinces me that in advanced age nature is unequal to such a process.

Thomas Monday, ætat 65. Blind from cataract, with obliterated pupil, was admitted under my care into the Radcliffe Infirmary. I thought it necessary, at that time*, to depress the opaque lens first, with the intention of making for him an artificial pupil, as soon as the eye had sufficiently recovered itself. I did not attempt the formation of the pupil till nearly a twelvemonth afterwards; when on making the section of the cornea and dividing the fibres of the iris, the opaque lens, in an almost perfect and unaltered state, escaped at the opening†. The wound in the cornea readily healed; the artificial

* In these cases it is best to proceed to the formation of the pupil at once, by an incision through the cornea.

† I have frequently met with this circumstance, in those cases, where the operation of depression having failed, I have been subsequently applied to, to form an artificial pupil.

pupil was beautifully clear, large and open, and the sight for his age very good.

A Case of failure of Depression, after which the Lens was successfully extracted.

William Taylor, ætat 30. Blind from cataracts, underwent the operation for depression by an hospital surgeon twice on the same eye without reaping any benefit. I subsequently extracted the cataract, which was nearly entire, from this eye. He recovered his sight, and returned home a fortnight after the operation.

The operation of extracting the opaque lens is the most perfect that was ever devised for the cure of cataract. The organ is not subject to the inconveniences and imperfections which in the old operation of depression are unavoidable; by this operation the diseased body obstructing the rays of light is with certainty removed from the eye. Thus there will be no danger of its remaining unabsorbed in situ; of its rising again; of a portion of the retina being

neuteralized by the situation of the lens in the vitreous humour; rendering the organ less perfect as an optical instrument; none of contracted pupil, but a full, fair, clear, and open pupil will remain, with free motion of the iris, which will enable the organ to adjust itself to distance, and render it, with the assistance of an artificial lens, as perfect as possible. There will be also no danger (from the situation of the depressed unabsorbed lens acting as a foreign body on the vascular choroid) of that chronic inflammatory disorganizing process, which eventually so changes the different structures and humours of the eye as to unfit them for vision altogether; and the surgeon will have no fears as to the ultimate success of the operation*.

* Since writing this work, I have perused Mr. Stevenson's Book on Cataract, which contains many valuable observations, but the facts I have here adduced are too strong to induce me to change my opinion, either in favour of depression or solution: was I the subject of cataract, I would not permit any surgeon to depress my lens. Although not personally acquainted with Mr. Alexander, I admire his practice, and he is, I believe, as strong an advocate for extraction as myself, whenever it is admissible.

I should not be taking an impartial view of the two operations, were I to conceal the objections that have been made to extraction, and amongst the foremost of these is the difficulty of the operation. Now it is by no means a fair way of canvassing the merits of an operation, to charge it with objections which apply exclusively to the operator; for my own part, I see no great difficulty in making, with proper instruments, a clear head, and a steady hand, a section of the cornea, two-thirds of its circumference.

There are surgeons to be found constantly in the habit of performing it with success; and notwithstanding I may not be supported by the opinion of most of my professional brethren, I will not hesitate to affirm, that the professed oculist, who has devoted not only years, but perhaps the whole period of his life, to this department of surgery, is the most proper person to be intrusted with operations on this important organ.

The next objection adduced, is the iris falling before the edge of the knife, in the

act of puncturing the cornea. This can only happen when the anterior chamber is too contracted, or when the operator is awkward in the management of his instrument; and even when it does occur, it is rarely attended with those unfortunate consequences which the advocates for depression are so ready to attribute to it. The iris is daily divided for the formation of artificial pupils without any unpleasant consequences. Baron Wensel must have injured it occasionally in his numerous operations for extraction, but with little inconvenience. Why then are we to admit that as an objection, which experience proves to be seldom injurious?—Lastly, it is objected to, that a portion of the cornea is liable to become opaque after the operation of extraction; but the office of this coat is merely to transmit the rays of light, so that the object or image may be duly impressed on the retina; therefore it is sufficient if the central portion of it retain its transparency.

ON THE OPERATION FOR ARTIFICIAL PUPIL.

THE operation of forming an artificial pupil, is the most difficult of any performed on the eye. First, because the cases requiring it are generally of a complicated nature. In some, the lens is opaque, and the iris or uvea adherent; in others, the lens has been destroyed by accident, and the pupil become obliterated from inflammation: the pupil frequently becomes so after unfortunate operations on the opaque lens; as after depression, or extraction. In the former, this effect is produced by the violent inflammation which frequently succeeds this operation; in the latter, it may be occasioned by the iris being wounded by the knife, and implicated in the healing of the wound in the cornea: but this is a more rare occurrence than is generally imagined.

Obliterated pupil is frequently met with in persons advanced in years: in these

cases the contraction takes place gradually; and the patients remark that their sight has been getting progressively worse for years. At first the pupil becomes contracted to the size of a large pinhole, but unaccompanied with any apparent change in the transparency of the lens: the capsule exhibits a bluish tint; but both, in general, subsequently become opaque. Wounds of the cornea implicating the iris, and blows on the eye, are apt to occasion obliteration of the pupil.

I shall now proceed to describe the principal modes of forming an artificial pupil, commencing with Cheselden's. His method consists of introducing a thin knife posterior to the cornea and iris; in bringing the point forward through the fibres of the iris, near its temporal circumference into the anterior chamber; and then in completing the division of its fibres as far as its nasal circumference. This operation appears to have been little practised even by Cheselden himself; and it is to Sir William Adams that the profession are indebted for the more general practice of

it. This gentleman has practised it with several modifications of his own, with great success; and not any eulogium I could bestow upon him would add to that splendid career which he is pursuing, and to that high distinction and patronage, which he so well deserves. This operation is necessarily difficult; for on the point of the knife coming in contact with the fibres of the iris, these naturally and unavoidably incline towards the cornea, and leave the point of the instrument situated as in a bag: by perseverance, this obstacle may be overcome, and the point of the knife may be made to penetrate the anterior chamber. The point of the knife having penetrated thus far, the section or division of the iris should now be completed. This is attended with some difficulty; for the iris being an elastic body, still recedes before the pressure of the edge of the knife; and it is only by gradual and repeated efforts (except in cases of diseased iris) that the complete section of it can be accomplished.

Case I.

Ann Anderson, ætat 35, who had been blind for sixteen years, and from her own statement had been admitted seven times into the Radcliffe Infirmary for relief, was, for the eighth time, admitted under my care. The globe of her eye was distorted and disorganized in consequence of the different operations performed on it: the vitreous humour appeared dissolved, and the sclerotica was dilated near the situation best calculated for the introduction of the knife for the formation of an artificial pupil: the pupil was entirely obliterated, and the iris changed in colour by inflammation. Such a hopeless case could hardly be imagined; indeed I viewed it so much in this light, that I gave it as my opinion that it was possible, though highly improbable, that an operation would succeed. Notwithstanding this opinion, the poor woman begged me to perform one. I accordingly introduced a thin knife through the sclerotica, below the situation of the

dilatation; and bringing the point of it through the iris near its temporal circumference, at one stroke divided it, through its whole diameter nearly to its nasal circumference: a full and open pupil instantly appeared: the eye was afterwards closed, and the poor woman put in bed. In making the division of the iris, I observed that the knife seemed to strike against some hard body; this, on inspection, afterwards proved to be the lens, converted into a substance resembling lime in appearance. On unbandaging the eye several days after the operation, the poor woman expressed herself highly delighted, for she had a confused perception of objects: her sight continued to improve from time to time for nearly a twelemonth after the operation; at which period, with the assistance of a glass, she was enabled to walk without her guide, and to attend to the ordinary occupations of life: the edge of the opaque lens became barely discernible at the temporal margin of the pupil, not in the smallest degree obstructing vision—and the size of the pupil was

nearly equal to the whole diameter of the cornea.

Case II.

A poor soldier who had been in Egypt, and whose sight had been destroyed by the endemic ophthalmia, applied to me for assistance. His left eye had suppurated, and the sight was entirely destroyed. The cornea of the right eye was partially opaque, and the pupil was obliterated: a small spot, about the size of a pinhole, indicated that the lens was not opaque. I performed the operation for an artificial pupil as in the preceding case. The point of the knife did not readily penetrate the fibres of the iris, which receded before it; and the iris was so tough, and gave way so frequently before the edge of the instrument, that it was only by repeated strokes that I could effectually divide it. The inflammation ran high after the operation, and required large and repeated bleedings to subdue it. From this period his sight improved, as the process of absorption ad-

vanced, and at the end of seven months it was restored.

The principal objections to this operation, are nearly the whole of those which are applicable to the operation of couching; and as I have already noticed those, it will be unnecessary to repeat them. The operator will frequently be defeated by the high degree of inflammation that almost constantly succeeds this operation. All the posterior operations are attended with a greater degree of inflammation than the anterior; and the freedom with which the knife must be necessarily used in this operation, subjects the organ to a greater degree of inflammation, and its consequences, than any other performed on the eye. Hence the surgeon will frequently be disappointed, by effused lymph blocking up the whole, or a portion of the new pupil. The globe of the eye will occasionally suppurate, and the divided fibres of the iris will now and then adhere. The retina also partaking of the mischief produced by this great excitement, will be so impaired and disorganized, as to render

consecutive operations of very little service. Lastly, in elderly subjects, the lens will frequently, I might almost say generally, remain unabsorbed, occupying the centre of the newly-formed pupil. Nor will I omit to mention, that several cases have come to my knowledge, in which the patient's lives have been endangered; and is this to be wondered at, when we reflect that the ophthalmic artery is a branch of the internal carotid, and situated at the basis of the skull. To me, therefore, it is matter of astonishment, that phrenitis does not occasionally follow this operation. In these cases, the inflammation runs so high, from the arteria centralis retinæ and ciliary arteries, injecting the vessels of the choroid with blood, and increasing the contained, beyond the capacity of the containing, tough, and unyielding coats of the eye; that the retina becomes materially disorganized and unfitted for useful vision, and ultimately the whole globe suppurates *.

* In these cases, the sight is destroyed, therefore immediate relief should be given, by evacuating the whole contents of the eye.

This operation is more likely to succeed in those cases where the iris has been rendered thin from disease, or is on the stretch from adhesions; as the knife will divide its fibres more readily. It is also one of the operations peculiarly suited to infants; though even for those, I prefer, for the reasons already given, an anterior operation, with modifications.

ON THE ANTERIOR OPERATION FOR ARTIFICIAL PUPIL.

THERE are two modes of executing this operation, differing only in the instruments made use of in performing it. In both, the section of the cornea is accomplished as in extracting the opaque lens; and the iris is divided in one case with the knife, in the other with the scissors. I believe it is to Professor Janin that we are indebted for the suggestion of dividing the fibres of the iris with the scissors; but I cannot refrain from expressing how greatly the profession are indebted to Professor Maunoir for his valuable remarks on this subject; as I am convinced that his mode of operating is more certain in its execution, and more generally attended with success, than any other. His scissors are so admirably adapted for this purpose, that I should consider my ophthalmic instruments very imperfect without them. The superiority of this operation over every other hitherto

devised for the formation of an artificial pupil is so very obvious, that its advantages scarcely require enumeration. After the section of the cornea, the operator with the scissors can with absolute certainty divide the fibres of the iris, in a perpendicular, or in any other direction; and on so doing, if the fibres do not recede enough, so as to leave a pupil sufficiently large, he may make another division transversely at right angles with the first: this second incision rarely fails of obtaining the object in question, namely, a fair, wide, and open pupil. The operator has it also in his power to remove a portion of the iris, of the form of an inverted V, if he thinks it necessary. If the case to be operated on is complicated with cataract, or opacity of the capsule of the lens, after an unfortunate attempt either at depression, or extraction, this operation presents a favourable opportunity for removing them; and if the lens and its capsule still retain their transparency, the blunt-pointed scissors will in many instances enable the surgeon to divide the fibres of the iris without injuring either of these im-

portant structures: thus the lens and its capsule will be preserved*, and the patient's sight rendered more perfect. When the iris is divided by the scissors in the manner previously described, its fibres rarely adhere; and when, to the advantages already enumerated, are added, that the interior structures of the organ are not at all invaded by this operation, I trust, that the scruples of every candid inquirer will be fully removed, and that they will acknowledge its superiority in the majority of cases. For my own part, I can affirm, that I was never disappointed by it, and I have practised it for several years.

There are several modes of forming an artificial pupil with the cornea knife. One is, to introduce the instrument through the cornea into the anterior chamber, till its point reaches the centre of it, and then to dip it into the iris, and bring it out on the opposite side. This operation I reject, on account of its not making a sufficient opening; unless it is

* The professor has been able to effect this, but I have not found it practicable.

my intention subsequently to enlarge it with the scissors, which I have frequently done with success. Another is, to introduce the cornea knife into the anterior chamber, and then to give its cutting edge a little inclination downwards, in order to allow the aqueous humour to escape, which bringing the iris in contact with the point of the knife, I am enabled to penetrate it close to the external circumference of the cornea: I then bring its point out at the same distance on its nasal circumference, and thus I divide the diameter of the iris. I afterwards cut separate and remove the ring of the iris with the scissors.

I consider Scarpas' method of forming an artificial pupil, by detaching the iris from its connexions with the ligamentum ciliare, objectionable, because there is a constant tendency in it to recover its natural situation. Cases may occur where it may be serviceable, as when a small portion of the cornea at its circumference only remains transparent.

The last subject for my consideration is

a comparison between the anterior and posterior operations for the cure of congenital cataract.

Now, although the anterior operation is attended with less inflammation than the posterior, still it is subject to what may be considered greater disadvantages; and amongst the foremost of these must be ranked the necessity of repeating it. It is by no means uncommon for infants to require this operation three and even five times, before the cataract or its capsule (which in the majority of cases is opaque or, from the first operation, subsequently becomes so) is sufficiently destroyed to admit of tolerably distinct vision. It may be adduced, that the frequency of these operations does not at all endanger the structure of the organ, but surely some degree of attention is due to the feelings of the parent, who naturally inclines to that mode of proceeding towards its tender offspring, which is best calculated to obtain the desired object with the least pain. I have before observed, that in the greater proportion of cases of congenital cataract,

that the capsule is opaque, or, from the inflammation excited by the first operation, subsequently becomes so. This opaque capsule is extremely tough, and will seldom readily yield to the impression of the needle; and as the needle made use of in the anterior operation is straight and slender, it is ill-calculated to rend or divide it; whereas the one I make use of in performing the posterior operation being curved, it enables me to rend and detach it with less difficulty, and at the same time its posterior situation gives me greater power. It generally happens that notwithstanding the anterior operation has been performed several times, that the little patient is obliged subsequently to submit to the posterior operation for the removal of the capsule. The operator need not apprehend any mischief from projecting portions of the lens into the anterior chamber; for the density or consistency of the lens depends on the age of the individual. Thus in infants it is very soft, except a small portion in its centre; in adults, and in middle age it acquires pro-

portionate consistency; and in old age it will generally be found much harder than at either of the preceding periods.

The lens in infants being entirely soft, little danger is to be apprehended from inflammation being excited in the iris, by portions of it being projected into the anterior chamber for solution. When I am performing the posterior operation on infants, I am in the habit of projecting portions of the opaque lens into the anterior chamber, and I seldom observe it followed by inflammation. In the majority of these cases, one operation succeeded. Lastly, considering it is generally necessary to have recourse to the posterior operation, even in those cases where the anterior one has been repeatedly performed, I now give the preference to it at first.

I do not mean that what I have here observed should contradict what I have before asserted, or detract from the preference which I have invariably given to the anterior operations, whenever they can

be performed; for they certainly interfere less with the interior and more material structures of the organ*.

* In order to perform the anterior operations on infants effectually, and at once, I suggest that a sharp needle, made strong by giving both its sides a slight degree of convexity, should be introduced after the manner of Saunders', and the operator should work at the centre of the capsule, disregarding the lens.

ON CONSECUTIVE OPERATIONS.

WHAT I would wish to be understood as constituting consecutive operations, are those to be undertaken on the eye after unsuccessful attempts either at depression or extraction of the opaque lens; or the formation of an artificial pupil: and also those to be performed after accidents producing blindness, by involving one or more of the material structures of the organ. And to these may be added, although not falling under the head of consecutive operations, those required after the destructive effects of inflammation whether chronic, or acute. Such as internal chronic inflammation, long continued, and ultimately terminating by the effusion of lymph in obliteration of the pupil. Also violent acute inflammation (as in the Ægyptian ophthalmy) involving several of the structures of the organ, and producing the different shades of mischief, from bursting or ulceration of the cornea, and partial obliteration of the

pupil, even to blindness. The period at which consecutive operations may be undertaken with safety, will vary so much, that general rules only can be laid down; still there are a number of circumstances which, if attended to, will greatly assist the judgment in selecting the proper one.

It should be considered as an undeviating rule, never to perform a second operation, till the organ has completely recovered from the first. I have been in the habit of waiting several months, even after all visible symptoms of irritation have subsided, before attempting a second operation. If this is not attended to, the operation will be performed under unfavourable circumstances. "For what will be done? the eye has already received an injury from the first operation, and before it has sufficiently recovered from the effect (inflammation) a second is inflicted." Can such an operation be expected to succeed? certainly not. Also, the time for repeating an operation should vary according to the effects of the former one, and the habit of

the individual: therefore, if the inflammation had run high, and had long continued, and the habit of the patient had been extremely irritable, it would then be prudent to lengthen the periods, and *vice versâ*. The nature of the structure operated on will also greatly assist the surgeon in selecting his periods: for instance, operations on the iris are generally attended with more inflammation than on either of the other structures; therefore, after an attempt at the formation of an artificial pupil, a longer period should be determined on.

I have, in several instances, waited a year, or even two, between these operations, considering that a premature operation might be entirely destructive to the organ, whereas deferring it a little too long was erring on the safe side of the question. Operations on the cornea are generally attended with less inflammation, consequently the intervals may be shorter, as after the anterior operations for congenital cataract: those on the sclerotica are attended with more, therefore in those the

intervals should be longer; as after the posterior operations on infants or adults. But as I am merely reviewing the different operations, I shall defer making any more comments on this subject for the present, as it will again be introduced to the notice of the reader.

The next subject for my consideration, is the diseases of the organ; and for the purpose of avoiding confusion, some method should be observed, and I cannot improve on the system hitherto pursued by my predecessors; which consists of considering the various structures in their proper order, both in a state of health, and subsequently under the influence of disorder or disease.

I shall be as concise as possible on the diseases of the least importance, and dwell only on the most important.

OF THE CONJUNCTIVA AND ITS DISEASES.

The conjunctiva is a mucous membrane lining the interior of the eye-lid, and covering the anterior surface of the sclerotica, to both of which it is slightly connected by cellular substance. When it arrives at the circumference of the cornea, the outer covering of which it forms, it becomes perfectly transparent, and is so closely connected with it, as to be separated from it only by small portions at a time, and this will be effected with difficulty. The foliculæ meibomii, caruncula lachrymalis, and lachrymal gland are covered by it, and it is continued down the puncta lachrymalia constituting the mucous membrane or lining of the nasal duct. It is supplied with blood-vessels, nerves, and absorbents, the former of which are visible on the eye-lids and at the point where it is connected with the sclerotica, but they are invisible over the cornea, unless the membrane is dis-

eased, when red vessels may be distinctly seen running into a breach or ulceration of the corneal conjunctiva. That it is supplied with nerves, is evident from the acute pain attendant on such ulcerations. That it also is supplied with absorbents is indicated by the gradual removal of partial opacities, or effused lymph.

The office of the conjunctiva is to connect the eye with the orbit, and to secrete a thin mucus, to facilitate the motion of the eye-lids over the globe. The angle formed by its reflection over the sclerotica prevents extraneous substances from getting to the posterior part of the globe.

The conjunctiva, being a mucous membrane, is subject to all the diseases peculiar to that structure; and the same effects of derangement may be traced in this as in the mucous membrane of the urethra. The first in order for my consideration will be simple inflammation.—Simple inflammation of the conjunctiva is generally attended with the concomitating symptoms of catarrh. The vessels of the conjunctiva will be found more distended with blood than

usual, and their secretion increased in quantity and altered in quality; instead of its being of a mild and almost colourless fluid, it will have acquired a deeper or straw-coloured tint. The lachrymation will also be increased, and uneasiness will be produced by exposure to a strong light.

This kind of inflammation prevails very much during the autumnal months, and in a cold spring, especially if north or north-easterly winds prevail, and is occasioned by suppressed perspiration: it is common for it to affect whole families.

The treatment for the removal of this complaint may be comprehended in that which is necessary for the cure of common cold, as small doses of antim. tartariat., assisted by nitre, and keeping the bowels regular.

As a local application, tepid fomentations with water should be used. The use of astringent applications or washes during this stage of the complaint will be prejudicial. This plan should be persevered in till the febrile symptoms and irritation in the organ have subsided; and I have seldom

found it necessary to make use of astringent applications. Should, however, the practitioner choose to use them, they should be of the mildest form, as the sulphates of copper or zinc, in the proportion of gr. i. ad gr. ij. in an ounce of distilled water.

Should the inflammation of this membrane be of a more violent or acute nature, the same symptoms will exist, but in an aggravated form. The pain will be more violent, and the lachrymation more constant; the vessels, not only of the conjunctiva, will become turgid with blood, but those of the corneal conjunctiva will become turbid, by transmitting other particles of the blood besides those strictly transparent; till at length, by the excessive action, they become so dilated as to admit even the colouring particles of the blood itself, constituting what may be termed vascular cornea.

In this stage of the complaint the same means should be adopted, and should be assisted by general and topical bleeding.

It sometimes happens that the violence of the inflammation being subdued, its

effects still continue; that is, the vessels of the cornea having been considerably dilated, they still continue to transmit red blood, constituting, as I have observed before, what is called vascular cornea. The removal of this atonic state of vessels should not be attempted till the general inflammation *is on* the decline, when it may be effected without difficulty.

There are two modes of producing the contraction of these vessels; one by the use of topical astringents, the other by a division of the dilated vessels: the former, being less painful, should be preferred, as it is generally effectual; the latter, though more certain, being more painful, should not be adopted till the former has been found ineffectual. Notwithstanding the great advantages ascribed to the use of the vinum opii, I must remark that it is to these cases of vascular cornea that it is particularly adapted, and in these it will be found a valuable remedy. At first I would recommend it in the proportion of one part to three of distilled water, afterwards its strength should be increased.

This will generally effect a gradual contraction of the dilated vessels*.

Should this method be found ineffectual, the dilated vessels should be divided, which will enable them to contract: they should be divided at the circumference of the cornea verging to the sclerotic conjunctiva; and for this purpose the globe should be made steady by the fingers of the surgeon; or, if he is not in the frequent habit of performing operations on the eye, Pellier's speculum may be used, though the introduction of an instrument of this nature while the organ is under the influence of disease, will greatly aggravate the patient's sufferings. The vinum opii should then be made use of, allowing one day to transpire from the operation.

Another effect of violent and long-continued inflammation is the production of granulations; these are easily removed by escharotick applications, as argenti nitrat. cupri

* If the eye of a patient with vascular cornea be examined through a magnifying glass, small ulcerations will frequently be discovered on it.

sulphas, alumen, or by the knife or scissors.

Ulceration also of the corneal conjunctiva, and effusion of lymph, constituting what is commonly called a film or speck, which is an opacity, is the effect of this species of inflammation. These should be gradually removed by escharotick ointments or washes, made use of at a period remote from the inflammation; if used before, they will certainly increase the original mischief. I am in the habit of examining the eye attentively through a magnifying glass, in order to detect the minute effects of the inflammation, for the purpose of removing them; and if ulcerations of the corneal conjunctiva with ragged edges exist, I find that the best application for placing them in a healing state, is a solution of nitrate of silver in water, and this should be applied with a camel-hair brush. For persons residing in the country, the ung. hydrarg. nitrat. mitius will be found a more manageable remedy, as it does not require that accuracy in its application.

In most ulcerations of the corneal con-

junctiva, when examined through a magnifying glass, or even with the naked eye, small red vessels may be seen running into them. In the early part of my practice, I was in the habit of dividing these vessels, as such a practice was sanctioned by many authors who have written on the subject: but experience and reflection have convinced me that these are the very vessels that are to heal the ulcerations, therefore, if they are divided, Nature will be checked in her operations; whereas, if she is allowed to proceed uninterruptedly, she will effect the healing of the ulcerations, and afterwards the vessels will contract to their original size.

The provisions of the cornea are such, that there is a natural tendency in it to retain its transparency; and this we find exemplified in cases where there has been a breach and destruction of its surface, for the site of the ulceration will be depressed considerably below its level, but its surface will retain its transparency. Did these ulcerations heal in any other way, the organ must necessarily be left imperfect.

When ulcerations of the conjunctiva are produced by lime or other caustic substances, a considerable degree of attention is required to prevent an union of the two surfaces, which would deprive the patient of the free motion of his lid.

The secretion from the cornea is sometimes deficient; instead of its presenting a smooth and polished surface, it appears dry, hard, and wrinkled, so that the lids move with difficulty over it.

The cornea, from age, experiences a loss of transparency around its circumference, described under the term of arcus senilis; it has sometimes been found ossified, and tubercular excrescences have been situated on it.

ON SCROFULOUS OPHTHALMY.

Scrofulous inflammation of the eyes is the most prevalent of any to which the organ is subject. The applicants for relief labouring under this disease are in the proportion of ninety in a hundred, and it affects children more than adults. In children its nature is more frequently acute; in grown up people it generally assumes a more chronic form. It is frequently attended with acute pain, lachrymation, and intolerance of light: the conjunctiva appears vascular, but does not always bear a proportionate vascularity to the intolerance of light. I have observed, that this intolerance of light depends on a breach of surface, for when there is ulceration it exists.

This species of inflammation is frequently attended with other circumstances that will greatly assist the practitioner in his diagnosis, as enlargement of the sublingual, submaxiliary, mesenteric glands and

tonsils, and ulcerations behind the ears, Tincea capitis, thickening of the ligaments, and enlargement of the joints. It is most prevalent during north-easterly winds, and those who have been previously affected by it are subject to a relapse when these prevail. In some, where the relaxation of the vessels of the conjunctiva and lids is great, it is most troublesome during moist or rainy weather.

The nature of scrofulous inflammation having been pointed out, the next subject for consideration is the treatment of it. During the acute stage, leeches should be applied to the temples or inferior eye-lids, and evaporating washes made use of. Should there be great intolerance of light, blisters applied to the surface of the temples will be found extremely beneficial. I have found these so serviceable in overcoming this distressing symptom, that their application has enabled children in a few hours to open their eyes, who had not been able to do so for months. The constitutional treatment, which is of great importance, should be of the sedative and

aperient kind, and should produce a determination to the surface of the body. The sedative I have been in the habit of using for many years: combining these advantages is, tartarized antimony alone, or with nitre, as

℞ Antim. tart. gr. ij.
Pulv. trag. comp. ʒ i.
Aquæ distillatæ q. s. fiant pilulæ,
xxiv dosis duæ ter quotidie.

vel ℞ Antim. tart. gr. ij.
Pulv. potassæ nitr. ʒ iij.
Sacchari ʒ ij misce fiant pulv.
xij capiat i ter quotidie.

vel ℞ Pul. jacobi veri gr. iv. ad gr. vi. ter quotidie.

This treatment, persevered in for several days, seldom fails of removing most of the distressing symptoms, as the acute pain; cough, which is often extremely troublesome, lachrymation, dryness of the skin, and general irritability. The soothing, sedative, and alterative properties of antim. tart. given in this manner are so truly astonishing, that I think it may be considered one of the most valuable sedatives we pos-

sess, as it unites most of the advantages without any of the disadvantages peculiar to other sedatives.

In some children, when the bowels are confined, I have found it necessary to unite calomel with it, and in the following proportion :—

℞ Antim. tart. gr. ij.
Hydrag. submur. gr. vi.
Pulv. tragac. comp. ʒ i
Aquæ distillatæ q. s. fiant pilulæ xxiv. dosis ij. ter quotidie.

Should it be necessary, an infusion of senna with manna may be given the following morning.

In some instances, the pain and irritability are so great, that it is necessary to administer opium ; and I have found it better to combine it with a moderate quantity of calomel as

℞ Opii pulv. gr. iij.
Hydrarg. submur. gr. vi.
Pulv. tragacanth. comp. ʒss.
Aquæ distillat. q. s. misce fiant pilulæ xij dosis ij ter quotidie.

All that will be required after the foregoing (unless the disease has been allowed to proceed to ulceration and breach of surface) will be a slight astringent application, such as cold water applied to the surface of the lids, head and face, assisted by the following application to the globe itself:—

℞ Zinci sulphatis gr. xij.
Vini opii ʒij.
Aquæ distillatæ ℥vi misce.

vel ℞. Cupri sulphatis gr. vi.
Misturæ camphoratæ ℥i
Aquæ distillatæ ℥v. misce.

Should the disease have advanced to ulceration, a very different mode of practice should be pursued. The eye should first be minutely examined through a magnifying glass, and the real state of the ulcer ascertained. If the edge of it should appear ragged or ash-coloured, and unattended by great vascularity; and if the system indicates a corresponding degree of debility, all further debilitating measures should be abandoned. The bowels should be kept regular, and by the most

gentle means. A more generous diet with a little port wine daily should be allowed, assisted by tonics, as bark and ammonia, with a little confect. aromatica, &c. The ulcer should be touched twice a day with the following solution, through the medium of a camel hair brush:—

℞ Argenti nitras gr. iii.
Aquæ distillatæ ʒi. misce.

In the course of a few days from the commencement of this treatment the edges of the ulcer will be found more regular and defined, and will have assumed a beautiful pearly blue tint: from this period the reparation of the breach of surface will progressively advance till it is entirely effected.

For persons residing at a distance, the ung. hydrarg. nitrat. mitius will be found a more manageable remedy, for it would be highly imprudent to trust patients with an application possessing such active properties as the solution of nitrate of silver in the above-mentioned proportion. This should be applied between the eye-lids with a brush, at first every night, and after-

wards night and morning; and tepid fomentations to the lids subsequently, if any or much pain should be produced.

The practitioner will more frequently be consulted, when the disease has assumed a chronic form; and it is not until considerable mischief has been done to the less important and more subservient parts of the organ, that medical assistance is sought after; as when the meibomiam glands have ulcerated, and the glands of the cilia and cilia themselves are destroyed; and the lids are found confined in the morning by the inspissation of a vitiated secretion, and when the symmetry and beauty of the features are considerably destroyed.

In this state, if the edges of the lids and situation of the meibomian glands be minutely examined, the points of ulceration throughout their whole course may be detected in the form of small white excavated spots. In many instances where the disease has existed for a considerable time, and particularly in elderly people in whom an habitual chronic inflammation has existed for years, red vessels of a considera-

ble size may be seen traversing the cornea from different parts of its circumference, and meeting in its centre; the cornea at the same time exhibits a hazy or cloudy appearance, rendering the sight extremely imperfect. These vessels, though frequently accompanied with ulceration, are not always so, and it is in the latter case, that a division of them is frequently found beneficial: though I would not generally recommend this, as astringents properly applied, will, in most instances, effect their contraction.

As it occasionally happens, when these vessels are numerous, that some of them escape division, and, as in many instances I have thought, and it appears that they have re-united, or have been re-distended by anastomosis, I prefer, where this is the case, removing a portion of the sclerotic conjunctiva. The portion of the conjunctiva containing the tissue of vessels, is to be laid hold of with a pair of denticulated forceps, and removed by one stroke of the curved scissors; unless a knife should be preferred.

This mode of proceeding will more effectually destroy them than merely dividing them. If the simple division only should be preferred, it will be prudent immediately afterwards to apply an astringent, as aqua lyth-acetat. ʒi. aquæ distillatæ ʒvij. misce.

In children there is frequently an habitual tendency to scrofulous inflammation, and every attack is generally attended with a corresponding degree of opacity from the effusion of lymph, till at length the sight becomes materially impaired. This is best prevented by a rigid attention not only to the organ itself, but to the constitution predisposing to such a state; for every part of the organ is absolutely and indispensably necessary for distinct vision: and as scrofula is a disease generally confined to a certain period of life, if its ravages during that period can be moderated or checked, so as to prevent it from materially injuring the organ, a very considerable and important object will be attained.

I am accustomed to observe that children afflicted with scrofulous inflammation

should be under the constant superintendence of a medical gentleman, who should carefully watch his little patients, and be prompt in subduing every attack of this nature, by adopting that proper constitutional and local treatment, which is best calculated to steer them through that period of life, when the ravages of this disease are most violent, and which, if not arrested, will lay the foundation of mischief which at no future period can be remedied.

I can assure my medical brethren, that although in some instances I have met with considerable difficulty in effecting this object, still in the majority of cases it has been easily effected; and it is certainly greatly to be lamented that a practice so simple, and capable of averting such a calamity, has not been more strongly enforced. How numerous are the objects afflicted with scrofulous opacity, amounting to actual blindness, that daily are presented to our notice; some admitting merely of relief by applications or operations; others destined to spend the remainder of their days in total darkness. How deep then must be

their regret, and that of all humane minds, when they are informed that most of this mischief might have been prevented by timely and well-regulated treatment during infancy.

I cannot conclude these remarks without making a few observations on the constitutional and local treatment that I have found most beneficial.

During the chronic stage, all debilitating measures are prejudicial. The principal object should be the invigoration of the system, and this will be effected by a regular attention to diet, air, exercise, a proper choice of tonics, and above all, the regulation of the bowels by the mildest aperients. The aperients which I consider most serviceable are those which possess the power of assisting the digestion of the food, and convert it into a state proper for sanguification, as rhubarb and tartarized soda, in the following proportions :—

℞. Sodæ tartarizatæ ʒss ad ʒj.
Pulv. rhæi opt. gr. viij. misce.
Quotidie sumendus.

This aperient clears the intestines of a

great quantity of mucus, and does not debilitate. It should be continued for a considerable time, and its use need not prohibit other tonics, as

℞. Ammoniæ preparatæ, gr. vi.
Infus. gentianæ comp. ℥ i. ss.
Tinct. card. comp. ʒ ij. misce.
Bis quotidie sumendus.

vel. ℞. Ammoniæ præparatæ, gr. viij.
Decoct cinchoniæ fort. ℥ i ss.
Tinct. ejusd. ʒ ij. misce.

vel. ℞. Ferri sulphatis ʒ i.
Pulv. zingib. ʒ ij.
Extr. gentianæ ʒ iij. misce. fiant pilulæ 60, dosis ij. ter quotidie.

Cicuta united with antimony or rhubarb is frequently serviceable, as

℞. Extract cicutæ ʒ i.
Antim. tart. gr. ij. misce.
fiant pilulæ xxiv. dosis ij. ter quotidie.

vel ℞. Extract conii ʒ ij.
Sulphuris antimonii præcip. ϑ ij. gr. viij.
misce, fiant pilulæ 48, dosis ij. ter quotidie.

vel ℞. Pulv. rhæi gr. vi.
Extr. conii gr. v. misce.
quotidie sumendus.

Of local applications: a recipe in which I

place great confidence, is the ung. hydrarg. nitrat. diluted, with the addition of opium in the following proportion:

℞. Opii colati ʒ ss.
Ung. hydrargi nitrati ʒ ij.
Ung. cetacei ʒ vi. misce.

The preparations of zinc and copper may frequently be used with advantage, and where there are ulcerations of the cornea, an ointment composed of the nitrate of silver with opium.

℞. Pulv. argenti nitrati gr. v.
Acid nitric gtt. iv.
Opii colati ʒ ss.
Ung. cetacei ℥ j. misce.

An aqueous infusion of opium, in the following proportion, is frequently useful.

℞. Opii pulv. gr. xij.
Aquæ distillatæ ℥ ij. macera per horam et cola.

Generally speaking, I have found aqueous solutions of opium preferable to spirituous ones. When the disease is obstinate, an issue in the arm, or any other convenient part, will occasionally be useful.

OF THE PURULENT OPHTHALMY OF INFANTS.

This, in the first instance, is inflammation of the whole of the mucous membrane of the conjunctiva, and although it will arise without any specific cause, yet the same changes on the mucous surface may be observed here, if not arrested, as may be observed on that of the urethra, under the influence of common gonorrhœa, or inflammation.

The time at which this inflammation may supervene, varies from one week after birth to several; indeed, no individual is at any age exempt from it, as the Ægyptian ophthalmia proves: still, in this country, it is more frequently met with in infants, and of this I shall therefore treat.

I shall entirely waive the common, and till lately, the previously-received opinion, that this disorder is the consequence of contact with gonorrhœal virus in the vagina; I will, however, grant, that a healthy secretion will occasionally prove

an irritant to a part unaccustomed to its stimulus, and it is in this manner that a newly-married man may sometimes be inconvenienced by his own wife, although she be chaste, and so far I am supported by the great Mr. Hunter.

The common and most prevalent cause of this disorder is cold, and one of its earliest symptoms is a slight discharge of limpid mucus from between the lids; the conjunctiva on inspection is more vascular than usual, and there is intolerance of light, and if the disorder should not be arrested, the lids swell prodigiously, and then an excessive purulent discharge takes place from between them; this is sometimes yellow, sometimes of a greenish hue, and occasionally bloody, but the nature of the discharge depends on the stage of the disorder. Should the interior of the eye-lids be examined in the latter stage of the complaint, they will be found vascular, villous, and granulated, and if the cornea should be visible, it will not unfrequently be found opaque or sloughy. If the disease has been neglected, the ulcera-

tion may have been so extensive as to have allowed the escape of the lens, or to have implicated the iris, and injured the cornea, so that loss of sight has been the consequence.

A general febrile state attends the commencement of this disorder, the secretion from the skin is checked, the tongue is white, and the bowels are irregular. The treatment should depend on the stage of the complaint: thus, at its commencement, the bowels should be regulated with scammony and calomel, and the secretion on the skin re-established by antim. tart. gr. $\frac{1}{8}$ ter quotidie, or a proportionate quantity of James's powder: a leech should be applied to each inferior eye-lid, and tepid fomentations in winter, and weak vinegar and water in summer.

Should it have advanced to the purulent stage, the eyes should be frequently cleaned with tepid water injected between the lids, and a slight astringent injection should be used: the astringent I prefer, is nitrate of silver, one grain to an ounce of water. Sulphate of copper, alum, and zinc, are also

good astringents, and they should be used in nearly the same proportions; dissolved in pure water, they are more elegant applications than Bate's collyrium, *&c.*: during this stage also, the bowels should be attended to.

If sloughing of the cornea should have commenced, then a tonic should be given, as a quarter of a grain of sulphate of iron, with a little sugar three times a day, or the same proportion of sulphate of quinine, or a few grains of extract of bark; and the bowels should be regulated by a few grains of rhubarb and magnesia, the former of which manifestly acts as a tonic on children. The edges of the ulcer should be pencilled daily with a solution of nitrate of silver, (three grains to an ounce of water,) till they become of a blue colour, which is the true and natural colour of a healing ulcer: the eyes should be kept free from the discharge, and the head should not be kept too warm. Should any opacity remain, it should be treated accordingly.

OF THE TUNICA SCLEROTICA.

This is the strongest coat of the eye. It covers the whole ball, except the part occupied by the cornea before, and the optic nerve behind: it is firmly fixed to the edge of the cornea, and is of a white colour; its fibres are closely interwoven with each other: its posterior part is thicker than its anterior, and its inner surface is in contact with the choroid. The tendons of the recti, and oblique muscles, are inserted into it; it is perforated posteriorly by the ciliary arteries, veins, and nerves; anteriorly by the anterior ciliary arteries, and vessels of the conjunctiva. It is nourished principally by branches from the ophthalmic artery, and its office is to protect and support the parts within it.

ON THE DISEASES OF THE SCLEROTICA.

The sclerotica being a thick, tough, and almost inelastic coat, is subject to all the diseases peculiar to tendinous and ligamentous structures. It is liable to a species of inflammation somewhat analagous to acute or chronic rheumatism; and it is frequently the seat of gout. The similitude that exists between the structure of tendinous and ligamentous parts, and that of the sclerotica, holds equally good in its diseases. Like them it is dully organized, slow in taking on inflammatory or diseased actions, but becoming extremely painful when under their influence.

Hence sclerotitis comes on in a slow and gradual manner, unattended at first with acute pain, but with a dull aching sensation, a feeling of tightness in the globe of the eye, and an uneasy sensation, increased by motion of the globe. The vessels situated beneath the sclerotic conjunctiva ap-

pear more numerous, and there is a perceptible expression of irritability in the whole organ. As the disease advances, the pain becomes more acute, and the aversion to light is greater.

It is the character of this disease to be tedious and protracted, but it rarely proceeds to suppuration. It is more apt to involve, from its long continuance, some of the more important structures of the organ, and in this manner to become injurious to vision. The choroid and iris, from their contiguous situation, are apt (where the complaint has been of long duration) to participate in the inflammation, and not unfrequently obliterated pupil, and opacity of the capsule of the lens, are the consequence. The latter effects are not produced at once, but in a gradual manner, by repeated attacks of inflammation, and alternate periods of freedom from it. It is sometimes two, three, or even several years before it is destructive to sight altogether; and, even in these instances, it is not at all uncommon for it to attack one eye first, and commit its ravages on that, before it

proceeds to influence the other. The inflamed vessels, on close inspection, will be found situated beneath the conjunctiva, and taking a straight direction in their course; their colour will be deeper than that of the conjunctiva, and not unfrequently the zone produced by the junction or anastomosis of the vessels of the conjunctiva with those of the choroid will be perceptible.

Lymph will be frequently thrown out, and the pupil will become contracted. Even in slight cases of sclerotic inflammation, the sight will be more imperfect than the appearance of the disease would indicate.

There are a variety of opinions as to the true character and nature of this disease, some authors conceiving it venereal, others imagining it rheumatic. For my own part, I have observed it accompanied with, and succeeding venereal, or what are commonly called pseudo-syphilitic and gonnorrhœal symptoms; and I have also frequently met with it unattended by either of these symptoms, and where I have considered it of a true rheumatic character.

Whatever difference of opinion there is as to the character of this disease, authors appear entirely to agree in the mode of treatment to be adopted for its cure; and for this purpose, the remedy principally made use of is mercury in its different forms, given in moderate doses, and persevered in for a considerable time. The preparations most to be relied on are those of the mildest nature, as the pilul. hydrarg. gr. v. nocte maneque, or hydrarg. cum creta.; or hydrarg. oxymur. gr. $\frac{1}{8}$, ter quotidie, or half a drachm of the strong mercurial ointment, rubbed in night and morning, and continued till the mouth becomes slightly affected.

These measures, if the urgency of the symptoms require it, (that is, if vision becomes impaired,) should be accompanied by topical or general depletion, bleeding from the temples by leeches, or cupping; and I have frequently experienced an immediate and most beneficial effect, even to the arresting the future progress of the disease, from opening the temporal artery.

But a considerable degree of discretion

is necessary in the use of these remedies, as this disease is frequently met with in cachectic and greatly emaciated subjects.

In some cases, I have found great benefit derived from small doses of hydrarg. submur. c. opio. nocte maneque, while in others, hyosceamus, or cicuta, either with or without antim. tart., or the sulph. antim. præcip., has materially relieved the symptoms.

But let me not mislead my reader by inducing him to suppose that this disease will invariably yield to the influence of mercury. The experience which I have had in these cases, induces me to affirm, that they will not all yield to its influence, and I have frequently overcome this complaint by treating it strictly as rheumatic.

The remedy from which my patients have derived the greatest benefit has been doses of James's powder, from eight to twelve grains, taken three times daily, assisted by small doses of nitre and camphor, as

℞ Camphoræ c. spirit. V. tritutrat. ℈j.
Pulv. potassæ nitrat. ℈ij. ad ʒi.
Sacchari purificati ʒiij. misce
solvend. in aquâ tepidâ ℔¾ et durante die sumend.

The following combination of ant. tart. c. camph. et opio. has been found serviceable.

℞. Antim. tart. gr. $\frac{1}{4}$.
Hydrarg. submur. gr. ß.
Opii pulv. gr. ß.
Camphoræ gr. iij.
Conserv. q. s. Misce ter quotidie sumendus.

Dover's powder, where there is great pain and irritability, will frequently give relief.

℞. Pulv. ipecac. comp. gr. viij. ad xij.
Nocte maneque sumendus.

Friction about the temples and forehead either with a stimulating liniment or ointment, and occasionally a blister to the temples, will be beneficial. Any attempt at scarification of the irritable and dilated vessels will aggravate the complaint.

In regard to topical applications to the organ itself, I have found those of the mildest nature generally give the greatest relief.

The principle to proceed on, should be to soothe the part, and allay irritation; and for this purpose, fomentations of warm

water, either plain or medicated, (which will have the effect of producing a secretion from the neighbouring vessels,) used during the paroxysms of pain, will be judicious. On the same principle, namely, that of soliciting a discharge from the vessels (which is one of nature's salutary methods of relieving inflammation), I have found one of the following ointments beneficial:

℞. Opii pulv. gr. vi.
Ung. cetacei ʒij. misce.

Vel ℞. Pulv. hydrarg. nitrat. rubr. ʒß.
Opii pulv. gr. viij.
Ung. cetacei ℥i. misce.

But these, and all applications to the organ itself, should be used with caution. Sometimes an aqueous solution of opium, in the proportion of twelve grains to six ounces of water, is useful; at others, an evaporating spirituous wash with goulard, applied to the eye-lids.

It is common for this disease, even under the most judicious treatment, to require one, two, or even several months for its

removal; and I have known it, in several instances, protracted for two or three years, with occasional periods of freedom from inflammation, and yet the patients have ultimately retained their sight.

The sclerotica is subject to scrofulous inflammation and ulceration, which in most cases may easily be distinguished by its being accompanied with symptoms of the disease existing in other parts of the body: as tumours in the breast, enlargements of the glands behind the ears, of the neck, jaw, affections of the joints, or abscesses.

The inflammatory stage of this disease is not very painful, and when it advances to ulceration, fissures or deep sores, with yellowish sloughy edges, without granulations, may be observed on the sclerotica. These ulcers are extremely indolent and insensible.

The constitutional treatment of this disease should be precisely the same as that described under scrofulous ophthalmy. The ulcers should be touched once or twice daily with a solution of nitrate of silver, in the proportion of gr. vi. ad gr. viij. in aqua distillat. ℥i.

Vel ung. hydr. nitrat. dilut.
Vel ung. hydr. nitrat. rubr.

This disease is also one of long duration, and in several instances I have found sea air and bathing of service.

The sclerotica is not unfrequently in arthritic constitutions, particularly in elderly people, the seat of gout. This disease may be confined to the sclerotica, but I have frequently observed it accompanied with cataract.

In the case of an elderly lady who was subject to gout, the paroxysms in the eye and temples were very severe during the night. In this case it was combined with cataract; red vessels, traversing the sclerotica, were distinctly visible, and small white spots, presenting the appearance of earthy deposit, were observed; the pupil was contracted, and the iris adhered to the capsule of the lens; a red vessel crossed the centre of the capsule.

I need not observe that an operation on such a case would be highly imprudent.

All irritating applications should be avoided. The topical applications should be of the soothing and sedative kind, as tepid fomentations, warm liniments to the temples and forehead, containing opium and camphor.

The constitutional treatment should be the usual one under this disease.

When the attack is violent, threatening the destruction of sight, more active remedies should be employed.

OF SCLEROTIC STAPHYLOMA.

STAPHYLOMA is nothing more than a dilatation or protuberance of the sclerotica; the colour of which will vary according to the tenuity of the sclerotica, or nature of the parts included in the staphyloma. Thus, if the sclerotica is very thin, the staphyloma will have a darker shade from the nearer approach of the choroid, *et vice versâ*.

It may be either idiophatic, arising from a tenuity of the sclerotica, or symptomatic of disease existing in some other structure of the eye. Thus a fungous tumour arising from the choroid, by producing absorption of a portion of the sclerotic coat, may occasion staphyloma. It may also arise from wounds or blows on the sclerotica.

The choroid coat is also subject to staphyloma, but no difficulty can arise in distinguishing this, as it may be always recognised by its dark and peculiar colour. It is sometimes situated near the junction of the cornea with the sclerotica.

WOUNDS OF THE SCLEROTICA.

These wounds, if they are large, and have penetrated deeply, are frequently destructive to sight, by injuring some of the structures more immediately concerned in vision.

The last disease for my consideration, is fungous tumours growing from the sclerotica. These are situated beneath the conjunctiva, and if large, the latter membrane may be perceived stretched over them. In removing them, the patient's eye should be fixed, and the conjunctiva covering them should be divided, and the tumours dissected off with a fine knife. If it is suspected that the disease may be regenerated, the surface of the wound should be slightly touched with argent. nitrat.

The sclerotica is subject to cancer, in which case, the eye and the whole contents of the orbit should be early removed.

OF THE CHOROID COAT.

The choroid coat commences at the entrance of the optic nerve, and extends to the edge of the flattened surface of the vitreous humour, nearly to the crystalline lens, and terminates with the retina at the ligamentum ciliare. It is situated between the retina and sclerotica, and is connected with the latter by vessels and nerves, which pass from one coat to the other: it is also connected by cellular substance of a brown colour, which tints the inner surface of the sclerotica: it adheres firmly to the sclerotica around the optic nerve, and at the ligamentum ciliare.

The ligamentum ciliare is a white ring, supposed to consist of cellular substance, connecting the root or external margin of the iris, and the anterior or fore part of the choroid to the sclerotica.

The inner surface of the choroid is villous, and has been described by Ruysch as a distinct membrane or lamina: some

anatomists retain the name tunica ruschiana; though Haller and Zinn demonstrate this coat to consist of only one lamina: the former, however, uses the term to describe the pigmentum nigrum. The inner surface of the choroid is covered with a brownish-black pigment, which lies immediately over the retina. This pigment is more abundant and darker at the fore-part of the choroid; towards the posterior part it is less abundant and thinner: near the optic nerve there is no pigment. It is generally supposed to be secreted by the vessels of the choroid; and, although cells cannot be distinguished by the microscope, it is probable that it is secreted in cells, since it does not stain the retina, which would be the case if it was otherwise. This pigment decreases in quantity, or changes in quality, in old age, and becomes either thinner or lighter in colour. It is sometimes, in diseased states of the membrane, detached; and in some cases, where operations have been performed on the iris, it may be observed floating in the aqueous humour.

The choroid may be said to be one of the

most vascular parts of the body ; indeed it appears almost entirely composed of vessels, as Somærings, Zinns, and other eminent anatomists' plates beautifully demonstrate.

The choroid coat, with its dark paint, serves to absorb the rays of light which pass through the retina, so that they cannot be reflected, and produce a second image; and thus a distinct one is formed at the bottom of the eye.

In the horse, cat, sheep, and in almost all graminivorous animals and beasts of prey, this pigment is of a bright colour, and acts as a mirror to reflect light, and thus conveys a second image on the retina.

The ciliary nerves which come from the ophthalmic ganglion, formed by the third and fifth pairs, run in parallel lines, at equal distances on the choroid. They penetrate the posterior part of the sclerotic coat around the optic nerve, and are plainly to be distinguished running on the surface of the choroid in their way to the iris.

The long ciliary arteries, which are derived from the ophthalmic artery, also penetrate the sclerotica, and are situated on

each side of the globe, in its centre, and pass on to form with the anterior ciliary arteries and the arteriæ ciliares breves, the inner or zona major, and the anterior or zona minor, arches which are situated, one at the basis of the iris, the other about midway between the basis and the pupil: from this latter zone branches are sent off to the edge of the pupil.

Beneath the ciliary arteries are situated the veins commonly denominated the vasa vorticosa, from the circular arrangement which their course describes: they run in whirls, not unlike the pendant branches of the weeping willow. These veins return the blood from the iris and ciliary processes; collect it in three or four branches, which penetrate the sclerotica, and convey it to the trunk of the ophthalmic vein.

The arteriæ ciliares breves pursue a course under the ciliary veins to the inner surface of the choroid, and, uniting at the fore-part of the globe with the anterior ciliary arteries, form a network on its internal surface. This is beautifully displayed by Zinn in a magnified drawing.

At the fore-part of the choroid coat, and opposite to the ciliary circle, there is a radiated black ring, called corpus ciliare. It is broader on the temporal than the nasal side: the choroid and retina adjoin its greater, and the cornea and iris its smaller circumference. In the posterior portion of the corpus ciliare, there are numerous pale, radiated ciliary striæ, covered with the pigmentum nigrum: near the connexion of the corpus ciliare with the root of the iris, these striæ become broader and more elevated, and form plicæ, or folds, between sixty and seventy in number, termed processus ciliares; the intervals of which are covered with pigmentum nigrum. The processus ciliares are each formed of two or more striæ, are not all of an equal size, and many of them are forked. The processes advance a little anterior to the circumference of the lens; they float in the aqueous humour in the posterior chamber of the eye, at the inner side of the root of the iris, and may be readily turned back towards the edge of the lens to which they are contiguous, but do not adhere. Viewed

through a microscope, the figure of each plica is triangular; one angle of which embraces the circumference of the crystalline lens, another terminates in the choroid, and the third is inserted in the iris at its root. The edges of the plicæ adhere to the duplicature of the vitreous capsule *.

* Zinn gives a magnified drawing of the vessels of the plicæ, which inosculate at their apices.

OF THE IRIS.

The iris is the only coat of the eye that possesses motion. It derives its name from being of different colours in different individuals, or as some suppose, from its resemblance to the chorion.

It is situated at a little distance from the cornea; commences a small way behind the junction of the cornea with the sclerotica, and running across, it forms a partition a little convex anteriorly, which is perforated in the middle by the pupil. It is divided into a ciliary and pupilary portion, and is attached to the extremities of the plicæ choroideæ at the inner margin of the annulus ciliaris.

Upon the back part of the iris, there is a dark-coloured pigment, formerly considered as a posterior layer, and called by the ancients, uvea. When this paint is removed, the iris exhibits two sets of fibres, each observing a different direction; one set runs in the form of radii, and com-

mences from the annulus ciliaris: from this the pupilary portion may be distinguished by its circular fibres, and darker shade of colour. These fibres surround the inner edge of the iris, and are considered as constituting the sphinctor muscle of the pupil*. The iris diminishes in thickness at its pupilary portion, the edge of which is extremely thin and defined.

It is abundantly supplied with blood-vessels and nerves. It undulates, or floats in the aqueous humour, and its expression beautifully harmonizes, or answers to the degree of light, or situation of an object;

* Dr. Jacobs describes the vessels of the iris as observing a serpentine course; and the iris itself composed of convex masses from which masses a number of elevated lines proceed towards the pupil.

He also describes the posterior surface of the iris covered by a thin membrane, which he believes to be a part of the membrane of the aqueous humour.

That the iris is muscular I am satisfied, from having frequently divided it after death with scissars, when it retracted considerably.

My work was written some time before Dr. Jacobs's correct and valuable remarks on the structure of the eye appeared in the *Med. Ch. Trans.* Vol. XII.

for instance, if an eye is engaged looking at a distant object, the diameter of the pupil is enlarged, *et vice versâ*. The action of the iris is supposed to be excited by the sensibility of the retina, and the body of light falling on it.

The iris regulates the quantity of light sent to the interior or bottom of the eye.

OF THE MEMBRANA PUPILLARIS.

THE pupil is occupied in the fœtus by a vascular membrane called membrana pupillaris. This is supplied with vessels from the iris, and these unite in the centre of it. This membrane is generally absorbed between the seventh and ninth month of uterogestation *.

Though I have never seen a case, it is probable that this membrane may be found unabsorbed.

* Dr. Jacobs observes, that it is not absorbed till the ninth month, and he has detected it perfect after birth.

OF THE DISEASES OF THE CHOROID COAT AND IRIS.

THERE are two kinds of inflammation of the choroid, the one primary, and arising from the immediate vessels of the choroid; the other secondary, and arising from the communication of the vessels of the choroid and iris with those of the external tunics of the eye: the latter is the effect of protracted inflammation of the conjunctiva.

The sclerotica which covers the choroid is so situated, as to deprive us of observing the changes produced by inflammation on this coat; but the peculiarity of the symptoms, and the subsequent condition of the contiguous membrane, the iris, furnishes us with such strong circumstantial evidence, as to amount to a positive conclusion, when the choroid is under the influence of inflammation. These symptoms are a sense of constriction or tightness of the globe, accompanied by so great a degree of tenderness, that the slightest pressure pro-

duces the greatest agony, and occasions a spasmodic affection of the muscles of the globe. The pain about the region of the orbit, forehead, and temples is very severe, and a thrilling or pulsatile throbbing, corresponding to each injection of the ophthalmic artery with blood, is felt in the globe along the course of the ciliary arteries. The pupil is contracted, and its edge turned inwards.

If the disease be not arrested at this stage, the iris, from its contiguous situation, and in consequence of its deriving its blood-vessels and nerves from the same source, speedily participates in the inflammation. The two zones or arches, formed by the anastomosis of the ciliary arteries on the face of the iris, become injected with blood, and more conspicuous: though the colour of these inflamed vessels is in some measure rendered less distinct in consequence of the pigmentum nigrum. There is also great intolerance of light.

The secondary choroiditis, or that arising from the communication of the inflamed vessels of the conjunctiva with those of the

iris and choroid, may be distinguished from the preceding or primary choroiditis, by a previous history of the case, as the secondary succeeds protracted inflammation of the outer tunics of the eye.

The cornea will appear cloudy; and a rose-coloured zone, situated at the edge of the sclerotica, will point out that the iris and choroid have partaken of the inflammation.

The inflammatory diseases of the choroid and iris, from their structure and situation, are so intimately blended with each other, that it is almost impossible to describe them separately: I shall therefore proceed to give an account of iritis, with those varieties that it occasionally presents.

Iritis must also be divided into primary and secondary: primary, as arising from its own immediate vessels; secondary, as arising from those of the conjunctiva by anastomosis.

In order to distinguish these two kinds of inflammation from each other, it is ne-

cessary that we should revert to our minute anatomy of the vessels of the choroid. Let us bear in mind, that the vessels of the choroid, namely, the ciliary arteries, principally supply the iris with blood, forming arches on its surface. Reasoning, then, from our knowledge of the anatomy of the part, should we not expect, in primary iritis, to meet with the first changes or symptoms of inflammation on its own immediate surface? and this is the case: for, at the commencement, the inflammation and its ravages, the effects, are for a long time confined to the iris. In order to elucidate this matter, let us enumerate a few of the primary appearances.

The two zones or arches, the one formed at the root, the other near the lesser circle of the iris, are injected with blood, and are conspicuous: (in some cases the action of the vessels is so great, that blood is extravasated between its fibres.) The body or substance of the iris itself appears thickened, from the effusion of coagulable lymph having agglutinated its fibres. The pupil is contracted, and the papillary margin of the

iris is thickened, turned inwards, and frequently angular. There is great intolerance of light; and not unfrequently globules of effused lymph are situated on the anterior surface of the iris; though, generally speaking, when this has happened, the capsule of the lens has partaken of the inflammation. The iris is also changed in colour; if of a brown colour, it becomes dirty red; if blue, it assumes a greenish tint. Hitherto then the disease is confined exclusively to the iris.

Now let us contrast these appearances with those wherein secondary iritis is the consequence of protracted inflammation of the conjunctiva, and we shall find symptoms in one, which are not to be met with in the other.

It is reasonable to suppose that the conjunctiva, corneal conjunctiva, and sclerotica, will suffer first: and this is the case, for ulceration will be met with on the sclerotic conjunctiva; the corneal conjunctiva will be found vascular and cloudy, and lymph deposited between its lamina and at the edge of the sclerotica.

During this process, which generally occupies a considerable time, the iris remains perfectly free from disease.—At length it participates in the inflammation.

The symptoms of primary iritis are almost precisely the same as those accompanying choroiditis, namely, pain in the forehead, temples, orbit, and head; a general tenderness and sense of constriction of the globe: the zones or arches, formed by the ciliary arteries on the greater and lesser circles of the iris, become conspicuous, and it is by no means uncommon to find blood extravasated by the violent action of the vessels in the body or surface of this membrane.

The pupillary margin of the iris loses its thin edge, it becomes inverted, angular, and permanently contracted, and it does not admit of dilatation from the application of belladonna. The secretion of the pigmentum on its posterior surface is checked; the fibres of the iris also undergo a change;

they become thickened and agglutinated by the effusion of coagulable lymph, which has the effect of restraining their motion, and produces a sluggishness of action, occasioning a species of paralysis. This effusion of coagulable lymph takes place to such extent on the posterior surface of the iris or uvea, as to produce an adhesion of its posterior surface and the anterior surface of the capsule of the lens, and this adhesion rendering the pupil permanently contracted, the posterior chamber becomes completely annihilated.

In many instances, masses or globules of lymph may be observed situated on the anterior surface of the iris, and dropping into the anterior chamber. Small sacs of matter may also be observed in the body of the iris, which, bursting into the anterior chamber, sink to the inferior margin of the iris, and thus constitute hypopion. The capsule of the lens becomes opaque, and adheres to the pupilary margin: the pupil becomes partially or entirely blocked up with lymph, the aqueous humour becomes

turbid, and the sight entirely destroyed: the globe of the eye occasionally suppurates *.

The pain is generally so severe as to deprive the patient of rest, though it is not always in proportion to the appearance or extent of the disease.

* Amongst the occasional effects of choroiditis and iritis, may be enumerated palsy of the ciliary nerves, deposit on the retina, a varicose state of the vessels of the choroid, fungous growths, adhesions between the iris and cornea, and protrusions of the choroid, from the sclerotica giving way.

OF SYPHILITIC IRITIS.

THE iris is also subject to a species of inflammation which has been denominated venereal.

This disease frequently succeeds syphilis, and it is not by any means uncommon to meet with it connected with syphilitic sores or eruptions.

It is attended with a dull heavy aching pain in the head, temples, and orbit: the sclerotica appears of a rose-pink hue near its union with the cornea, and the vascular zones or arches on the iris are extremely distinct: the pupil becomes angular and contracted; masses of yellow lymph are thrown out, either partially or entirely blocking it up, and the disease, if unchecked, rapidly goes on, to the destruction of sight. These symptoms are so different from those of secondary iritis, that it is almost impossible to confound the two diseases.

OF THE TREATMENT OF THESE DISEASES.

The first object in the treatment of primary iritis, or choroiditis, should be the reduction of the system; since it is in this manner only that the undue action of the ophthalmic artery which is a branch of the internal carotid can be influenced. But in doing this a due regard must be had to the strength and constitution of the patient, otherwise, by injudicious depletion, that state of the system will be produced which is so ably described by Dr. Latham in his paper on the effects of improper venesection, to which I refer my reader. The strength of the pulse therefore, and the urgency of the symptoms, should direct the practitioner in repeating the bleeding; and I would not have him pursue it when, with the assistance of other remedies, the pulse is reduced to its natural softness and frequency; this effect being produced, every subsequent bleeding will not only be unnecessary, but injurious.

Some degree of consideration is also necessary in the choice of remedies, since those should be selected which will effect the object in question with the least expense to the constitution: hence one good and full bleeding from the arm will frequently effect at once what several smaller bleedings, amounting to a far greater quantity of blood, will not. I cannot speak in too high terms of the abstraction of blood from the temporal artery; for the instances in my practice are almost innumerable, where this has succeeded, when every other mode of depletion has failed. This is, indeed, a painful remedy, and I seldom have recourse to it, till I find depletion carried to a reasonable extent by every other method ineffectual.

In order that some idea may be conveyed to my readers of the experience I have had of the effects of division of the temporal artery, I shall observe, that for years I have been in the habit of opening this vessel when the cases required it; which enables me to contradict some erroneous notions on the effect of a partial or

entire division of it. It has been observed, that its entire division, after the abstraction of blood from it will cause it to stop: this is not the case, for when the artery has been large, I have always been obliged to make use of a ligature, which I invariably prefer to secure it. The advantages of the ligature over pressure are too obvious to need enumeration; the patient is much more comfortable, and the surgeon is under no apprehension of secondary hæmorrhage; which is very common in those cases where pressure has been adopted, particularly when the heart has recovered its influence. The artery will almost invariably be found small in elderly persons, and will not bleed much; therefore in them venesection should be preferred. An exception may be made to men who have been employed in laborious bodily exercise; in them the artery will be found of considerable size.

Opening the jugular vein will also be found frequently efficacious.

During the height of the inflammatory stage, the diet should correspond with the other remedies; it should be of the most

sparing kind, and consist of light broths, &c.

The action of the heart and arteries should be moderated through the medium of the stomach, by the production of nausea and perspiration, and for this purpose, I must acknowledge the superiority of James's powder, or tart. antim. over every other remedy. Whatever the opinions of other medical men may be of this valuable remedy, I conceive we are not perfectly acquainted with its composition. I have administered it in cases of violent inflammation of the eyes for years, and by its use have so controlled the action of the heart and arteries, as to supersede the necessity for such frequent application of the lancet.

The dose I generally commence with is ten or twelve grains, which is repeated every six hours; if nausea is not produced, the quantity is increased, till this effect is obtained, which is generally accompanied by profuse perspiration. This nausea and perspiration should be encouraged for several hours, and the medicine repeated, and assisted by tea or weak broths. When

this plan has been persevered in for forty-eight hours, the frequency of the pulse will be found reduced, and it will have acquired its natural softness. I have generally found that, as the nausea and perspiration proceeded, the pain in the eyes, which was previously very severe, became comparatively trifling.

In the intervals the patient should be refreshed by saline draughts made of kali and lemon-juice.

The medicine which approaches nearest in its effects to James's powder is the antim. tart., and this I am in the constant habit of substituting for my poorer patients, who are incapable of procuring this medicine on account of the expense. Of this an adult may take a quarter of a grain three times daily, and in some instances they will take half a grain at a dose, before nausea is produced. It is not so certain in its operation as James's powder, to which I have frequently been obliged to have recourse when the antim. tart. has failed.

Should the inflammation still continue, the abstraction of blood from the temples,

by cupping, will be proper, as it will be useful as an adjunct to general bleeding. Leeches to the temples and on the angular vein may be used with benefit, provided they are sufficient in number: if used on the lids, they will occasion them to swell, and should therefore be avoided.

Blisters are safe applications, and towards the decline of the inflammation will sometimes give relief.

They should be applied on the temples or forehead, and should not approach too near the external angle of the eye or orbit, as they may occasion swelling of the eyelids. But most of these remedies may be considered uncertain, as they will be situated very remote from the immediate seat of the disease.

With regard to topical applications, those of a soothing nature, possessing the power of promoting secretion, and allaying irritation, invariably give the greatest ease; such as plain or medicated fomentations, repeated and continued during the severe paroxysms of pain; all stimulating ointments or washes invariably aggravate this disease.

The violence and urgency of the inflammatory symptoms being arrested, I shall next consider the treatment proper for its effects, *videlicet*, injury of the iris, effusion of lymph, contracted pupil, and opaque capsule.

There is no remedy that can be more relied on for restoring the transparency of opaque structures, and promoting the absorption of effused lymph, than mercury exhibited judiciously, and in small doses. I have given it in the form of blue pill night and morning; and when it was difficult to make the constitution feel its influence, I have directed half a drachm of the ung. hydr. fort. to be rubbed in every night, and this with the happiest result. It has generally happened that, on the system feeling its influence, the patient has experienced a corresponding improvement in sight; and on examination of the eyes, the transparency of the opaque structures has been improved. The iris, after the use of mercury, sometimes recovers a trifling degree of motion, but the pupil rarely admits of its natural degree of dilatation.

But it is in the venereal iritis, that the good effects of mercury are most strongly marked. In this, it is not only beneficial, but absolutely, and I may add, indispensably necessary: small doses will not answer the purpose; the constitution must feel its influence. I have been in the habit of directing a five-grain blue pill night and morning, and half a drachm of the strong mercurial ointment, to be used by friction every night, and I have not objected to a slight degree of plyalism; but I would observe by way of caution, that a distinction should be made between weakly and delicate constitutions and those of more robust stamina, and the quantity proportioned accordingly *.

Mercury, used in this manner, will seldom fail of producing the absorption of those masses of coagulable lymph, which almost invariably attend this disease, and with which the pupil is either partially or entirely blocked up. Though I would observe, on the other hand, that it is ne-

* In every species of iritic inflammation, the extract of belladonna should be applied to the eye-brow.

cessary to watch the progress of the disease, lest the mercury should have a tendency, which it sometimes has, to accelerate or produce suppuration, and occasion a disorganization of the globe; when this effect is threatened, its exhibition should be immediately arrested.

There is a species of choroiditis or iritis, which is of a truly scrofulous nature, and mercury used in this disease would be highly prejudicial, so much so, that a mistake of this nature would, in all probability, terminate in loss of sight, or disorganization of the globe. These cases may be easily distinguished by their being generally accompanied by other symptoms of scrofula, and by being unattended with pain.

Lastly, in the treatment of secondary choroiditis or iritis, the attention should be principally directed to the seat of the original disease; as, on the subjugation of this, the inflammation, which is merely sympathetic, will gradually cease; but as I have already treated of the increased vascularity of the sclerotic and corneal conjunctiva, I shall not repeat it.

ON DISEASES OF THE CHOROID COAT, (OF RARE OCCURRENCE.)

THE following diseases have been noticed by Mr. Wardrop and other authors, who have written on the morbid anatomy of the eye.

The choroid has been found ossified, and a thin plate of bone situated beneath it.

Water has been discovered situated between the choroid and retina, in which case, the retina and vitreous humour were displaced by the morbid collection; the vitreous humour was absorbed, and the retina shrivelled up, and lying in the centre of the globe.

Ware found a yellow fluid situated between the choroid and retina; and water has been found between the choroid and sclerotica.

Wardrop, Scarpa, Haller, Morgagni, and several other eminent anatomists, mention the existence of a thin cup of bone situated between the sclerotica and retina.

The choroid is frequently the seat of fungus hæmatoides; and cases are on record, where the choroid coat of the eye was entirely wanting.

OF TREMULOUS IRIS.

A TREMULOUS state of the iris is by no means uncommon, and I have generally observed it accompanied with an optical defect in the organ. The eyes of individuals affected with this disease are extremely soft to the touch.

On some occasions, it is produced by a rupture, or breaking down of the cells of the vitreous humour, after depression of the cataract. I have observed it in congenital cataract.

By some authors, it is attributed to palsy of the iris, and others consider it as arising from too great an accumulation of aqueous humour in the posterior chamber. I ascribe it to a laxness of its muscular fibres.

TUMOURS OF THE IRIS.

Several authors, and amongst them Mr. Wardrop, in his valuable book on the *Morbid Anatomy of the Eye*, have taken notice of the existence of fleshy tumors growing from the body of the iris; these have been found to bleed very profusely into the anterior chamber. These tumors are more frequently met with in the horse than in the human species.

PROLAPSUS IRIDIS FROM ULCERS.

This frequently occurs from ulcers, or after operations. In these cases, the edges of the ulcer should be slightly touched with a solution of nitrate of silver, in the proportion of seven grains to one ounce of distilled water. If a prolapsus of the iris takes place after an operation, it should be gently replaced.

WOUNDS OF THE IRIS.

These happen frequently among labouring people; from the point of a reaping-hook, or other sharp instrument. The capsule of the lens is generally punctured in these cases, and the lens itself becomes opaque.

In several instances, I have observed that the instrument has formed a complete artificial pupil.

OF THE

MEMBRANA PUPILLARIS.

This delicate little membrane, which I have already described as being extremely vascular, and occupying or filling up the opening forming the pupil, previous to birth, and which is absorbed between the seventh and ninth month of utero-gestation, now and then remains unabsorbed, and occasions blindness. I shall therefore, by way of distinction, call it cataracta membranæ iridis.

It will be difficult to confound this with common cataract, as it will represent a fine vascular membrane, on the same plane as the iris, occupying the centre of the pupil. Its anterior situation to the lens will render the anterior chamber narrower than usual, so that it cannot be mistaken for capsular cataract.

Amongst the cases we have on record of

this membrane being found imperforate, is one of a boy ten years of age, operated on by Cheselden: another is mentioned by Wenzel, but in one eye only.

The operation should consist in introducing a fine straight spear-pointed needle (rather stronger than the one used by the late Mr. Saunders) through the cornea, near to its junction with the sclerotica: the point of the needle should then be carried in an horizontal line till it reaches the centre of the pupil or membrane, which should then be punctured or ruptured, care being taken that the point of the instrument does not dip so far into the posterior chamber as to puncture the capsule of the lens, which lies almost immediately behind it; for should the capsule of the lens be punctured, the lens itself will become opaque, and the infant or patient will be compelled to have the lens removed, which will render the sight very imperfect.

It is by no means improbable that, by merely rending this membrane, its entire absorption might take place; at all events, this operation might be repeated,

and thus the interior and more important optical structures of the organ would not be endangered or impaired.

The posterior operation should certainly be avoided, as its performance would necessarily sacrifice the crystalline lens.

OF THE

OPTIC NERVE AND RETINA.

THE optic nerve passes through a cribriform portion of the sclerotic coat, at the back part of the globe of the eye*. It does not penetrate this coat exactly in the axis of the globe, but a little nearer to the nasal side: immediately on its ingress it expands to form the retina, so called, from its supposed reticular or net-work appearance. The retina is situated between the choroid coat and the membrana hyaloidea, or capsule of the vitreous humour, to the former of which it is slightly connected: a small quantity of slimy mucus is secreted between the under surface of the retina and the membrana hyaloidea, so as to prevent their union, except in a slight degree, by cellular substance: the retina advances between these two membranes nearly to the edge of

* Loder gives a plate of this circulus cribriformis in Oculo Vitulino.

the circumference of the capsule of the crystalline lens. It appears to adhere to the corpus ciliare, and is connected at its anterior extremity to the edge of the membrana hyaloidea: at its anterior border it bears the impression of the corpus ciliare and pigmentum nigrum *. On the temporal side of the optic nerve there is a yellowish foramen, around which the arteria and vena centralis describe a vascular corona. This appearance was first described by Sœmmering, under the term macula lutea. This foramen, or spot, has been found altered in colour: its functions are unknown †. The retina presents throughout

* Dr. Jacobs describes the retina as terminating anteriorly to the canal of Petit and ciliary processes of the vitreous humour, about a quarter of an inch from the circumference of the lens.

† Dr. Jacobs, in the *Philosophical Transactions* for 1819, page 300, has noticed that the retina, on its external surface, is covered by a delicate transparent membrane, united to it by cellular substance and vessels, apparently of the same nature as that which lines serous cavities. His mode of displaying this membrane consists of removing the posterior half of the sclerotica, and fixing the cornea with wax to the bottom of a vessel; by which the eye may be secured under water. With a pair

an uniform thickness and consistency; is of a dullish gray colour, and of a pulpy texture. It is the absolute seat of vision, all the other structures of the organ being subservient to it.

of dissecting forceps in each hand, the choroid coat should be gently torn open and turned down: if the exposed surface be now carefully examined, an uniform villous structure, more or less tinged by the black pigment, presents itself: if a breach is made in it, a membrane of great delicacy may be separated and turned down in folds over the choroid coat, presenting the most beautiful specimen of a delicate tissue which the human body affords. If a small opening be made in the membrane, and the blunt end of a probe introduced beneath, it may be separated throughout, remaining loose over the retina: it covers the retina from the optic nerve to the ciliary processes, and its separation leaves the macula lutea of Sœmmering more conspicuous. This membrane is sometimes separated from the retina by an effused fluid, and, in a healthy state, is attached to the choroid by cellular substance and vessels. Dr. Jacobs also observes that the choroid is connected to this membrane, the membrane to the retina, and the retina to the vitreous humour; so that the previous received opinion, that the retina is extended between the vitreous humour and the choroid, from the optic nerve to the ciliary processes, without any connexion, is erroneous. This I have frequently observed in the eyes of animals.

OF THE

DISEASES OF THE RETINA.

THE first disease for my consideration is retinitis, or inflammation of the retina; and fortunately this disease is not very common, since its symptoms are extremely distressing. Retinitis may be divided into idiopathic and symptomatic. The symptoms of idiopathic retinitis are, great intolerance of light, so much so, that the patient not only seeks the darkest chamber, but closes his eye-lids, and retains them constantly so; he dreads the minutest pencil or ray of light, and complains of vivid red flashes constantly passing before his eyes: a pulsatile throbbing is felt at the back part of the globe, and the pain in the bottom of the orbit, head, forehead, and temples, is very distressing: the eye cannot endure inspection; if it does, the pupil is found obstinately contracted to shield the retina from light, but neither the cornea, sclerotica, nor choroid, exhibit any increased vas-

cularity. The retina is also subject to a species of chronic inflammation, in which there exists a morbid sensibility to light, so that the patients experience considerable inconvenience and pain from the light during the day.

Some years ago a lady, labouring under this affection, consulted me: she was extremely delicate, the mother of several children, and had suffered from this complaint for several years: her sight was extremely perfect, but the exercise of it even for a few minutes was so painful, that she was obliged to desist: the light was so oppressive to her that she constantly wore yellowish-green spectacles. She remained at Oxford under my care nearly two months, and eventually recovered.

The treatment of acute retinitis should be that of inflammation generally.

Symptomatic retinitis is frequently connected with, and attendant on, phrenitis; and in violent ophthalmia, the retina, in some measure, participates in the derangement, which is indicated by the great intolerance of light.

OF SOME OF THE MORBID SENSIBILITIES OF THE RETINA, PRODUCED BY EXTREME DARKNESS OR INORDINATE DEGREES OF LIGHT.

The human eye evidently possesses the power of accommodating itself, to a certain extent, to different degrees of light. We have an example of this on going into the air on a very dark night; at first we can distinguish nothing, but gradually the largest and most prominent objects become conspicuous; and there are cases on record where persons confined even in the darkest dungeons have gradually acquired the power of beholding tolerably minute objects. Vide a case quoted by Wardrop, in which an individual confined in a dark dungeon could see the mice which infested his abode.

It is admitted that the sudden exposure of the eyes of persons, who have been confined in darkness, to a bright light or open day, is extremely dangerous; and we ac-

knowledge the caution required after the operation of extracting the opaque lens.

Travellers observe that an inordinate degree of light produces an increased sensibility of the retina; thus, near the northern poles it is found necessary to protect the eyes from the injurious effects of the wide expanse of snow with which they are surrounded. During particular seasons of the year, in crossing the deserts of Arabia, we are informed that the eyes of travellers suffer very severely from the combined influence of the excessive heat of the sun, winds, and sand.

OF NUCTALOPIA.

This is an affection of the eyes in which patients see very well during the night, but are quite blind, or nearly so, during the day. Instances are on record of individuals being able even to read during the night; but as these cases are mentioned principally by the ancients, we must rely entirely on their veracity. Hippocrates, Galen, Paulus Ægineta, Celsus, Pliny, and numerous other Grecian and Roman physicians, take notice of this peculiar morbid affection of the retina; but there appears a great discrepancy of opinions amongst them: for further information on this subject, the reader will do well to consult their works. Boerhaave gives an account of a man confined in a dark dungeon, who gradually acquired the power of seeing objects in the dark; he also slightly alludes to the cases of Tiberius, Nero, and Alexander, who seemed to possess the same faculty. Mangetus also gives a full account of nuctalopia and heme-

ralopia: he relates two cases, the one a servant, the other a divine; both were cured by ox liver. Gooch also relates an interesting case of nuctalopia. By some writers this morbid sensibility is attributed to a deficiency of the pigmentum nigrum, thus rendering the retina too susceptible to light during the day: it certainly is a disease involved in great obscurity.

OF HEMERALOPIA.

INDIVIDUALS suffering under this disease can see during the day, but become perfectly blind, or nearly so, during the night, or the instant the sun sinks below the horizon. Boerhaave observes that the sight of these persons becomes gradually more imperfect as the day declines, and they are conscious of the sun having set, by being subject to perfect darkness. This morbid insensibility of the retina, we are informed, is by no means uncommon in southern climates.

I was consulted some years ago by a young woman, who then lived at Watlington, who for sixteen years had laboured under this complaint: the instant the sun set she became totally dark, her sight not returning till daybreak. She was a delicate female, and as I saw her but once, I had no further opportunity of learning more of her case. Scarpa has noticed this morbid insensibility of the retina; and Wardrop makes mention

of coloured vision, wherein every object appeared blue, or green.

Of the organic changes which take place in the substance of the retina, at present little is understood; but it appears not at all improbable that those remarkable spectra (which are described by patients as appearing before their eyes, amongst which may be included muscæ volitantes) arise either from deposit in the substance of the retina, or from some inequality in the circulation of the fluids in its vessels, and perhaps from both.

Morgagni, in his 52d Letter, article 30 and 31, mentions the case of a beggar, in whose eye the retina was found ossified; and, in his 13th Letter, article 9 and 10, he mentions finding the situation of the retina occupied by a thin plate of bone. Haller, in his *Opuscula Pathologia*, Obs. 65, notices the retina in solidam materiam mutata: Zinn found it ossified; and St. Yves separated from the choroid by a fluid.

OF STRABISMUS, OR SQUINTING.

This is occasioned by the axis of the eyes being turned in opposite directions to each other, and is produced by a variety of causes. It frequently arises from an optical defect in the organ; that is, the one is a perfect, the other an optically imperfect eye; and a non-association of the axis of each eye is absolutely necessary for a correct perception of an object; and it may be remarked, in this place, that children who squint, frequently see double with the imperfect eye. Sometimes it arises from a non-association of the irises, as in these cases the focal distance of each eye is different. I had an opportunity of observing this circumstance lately in a gentleman who had one pupil dilated, while the other was contracted, but he could see to read with either eye at different distances. Squinting is sometimes the effect of habit; thus, children will learn to squint from imitating individuals who squint, and who constantly live with them:

confinement for years to a particular posture will occasion squinting, particularly if an object placed in one situation attracts the attention of an individual; it is not uncommon in children who have worms, or affections of the primæ viæ; it is also symptomatic of diseases in the brain, as hydrocephalus, tumors, *&c.* Wounds of the supra and infra orbitar nerves are now and then followed by strabismus*, and children born with cataracts generally squint. The direction of the squinting eye is either to the nasal or temporal angle.

* Some opacities of the cornea will occasion strabismus.

OF DISEASES OF THE BRAIN AND OPTIC NERVES, PRODUCING BLINDNESS; AND OF AMAUROSIS.

NOTWITHSTANDING much has been written on the nature and causes of amaurosis, still this disease remains involved in obscurity. It may be divided into two kinds; the one being situated in the brain, or optic nerves, previous to their exit from the cranium; the other being confined solely to the retina.

The diseases of the brain, producing amaurosis, from pressure on the optic thalami and on the optic nerves, are hydrocephalus, scrofulous and steatomatous tumors, hydatids, aneurisms, effusions of blood from apoplectic seizures, exostosis from the sella tursica, and various other circumstances producing an interruption of their functions. The symptoms of most of these diseases are excessive pain in the head and in the substance of the brain, a paralytic

affection of some part or organ, fits or convulsions, accompanied by temporary blindness or squinting; and in children suffering from hydrocephalus, the head becomes of a prodigious size; the pupils are generally dilated, insensible to the impressions of light, and the eyes lose their expression. The state of dilated pupil does not always exist, and I have dissected several cases wherein the pupil was obstinately contracted. I cannot better elucidate this matter than by relating the dissection of several cases which lately were the subject of my attention. The first is that of a tumour in the brain which produced blindness.

Jane Davis, ætat. 30, had been subject to fits eleven years back; the fits had left her for several years, but soon after she was attacked with fever, in which the brain was the organ where the symptoms were most distressing; on her recovery she observed that her sight was materially impaired, and eventually she became blind: it was not till this period of her complaint that I was consulted. I found her still complaining dreadfully of the pain in her head, with a

pulse between 90 and a 100, which evidently indicated that disease was still going on: perfectly blind, and with the pupils of her eyes monstrously dilated. I considered the case so hopeless, that I merely directed her bowels to be kept open, and, when the symptoms were violent, to lose a small quantity of blood, which always gave her temporary relief. Towards the conclusion of her illness her pulse became remarkably slow, even as low as 50, and her fits were frequent till she died.

DISSECTION OF THE BRAIN.

The interior of the skull was remarkably rough and pointed, so much so, that I never met with it to such a degree before: the brain on its surface appeared yellow and harder than natural; the left hemisphere was perfectly free from disease; the ventricle contained a rather larger quantity of serum than natural. In the right hemisphere, and near its lower portion, was situated a tumour about the size of an orange; it was with difficulty that the knife made any impression on it, and it was between

the consistence of cartilage and brain: the brain appeared pulpy, and broken down over the optic nerves; little or no fluid was observed on the right side, and the tumour destroyed all traces of the ventricle: the optic nerves were rather inflamed, but not all enlarged, and both eyes, which were examined, were perfectly natural. The patient lost the sight of her right eye a considerable time before the left.

But every tumour in the brain will not produce permanent blindness, and water in the ventricles, even in considerable quantity, will not always occasion it, of which the dissection of the following case is an example.

—— Capel, ætat. 12, or thereabouts, had been admitted into the hospital several times for scrofulous affections of the joints, and at length symptoms of the same disease in the brain appeared; his head became large, and he was subject to fits; during the latter part of his illness the fits produced temporary blindness, but his sight always returned, and continued perfect till he died; the pupils of his eyes were generally dilated, but answered to the impressions of light.

DISSECTION OF THE BRAIN.

On the right side of the brain, immediately in contact, but beneath the dura mater, a large yellowish scrofulous tumour was situated, which was with difficulty divided with the knife; and, on opening the ventricle, a pint of water at least escaped. On the left side were two other tumours, nearly of the same size, one of which was situated a little behind the optic thalami: a glary scrofulous lymph covered the optic nerves, which were slightly inflamed and greatly enlarged.

The next case is that of a boy, who was brought into the hospital for an injury of his head; a fold-stake had been thrown at him, which fractured his skull and entered the right hemisphere of the brain: he lived for a week, and his sight was perfect to the last; his left side was paralyzed before he died.

DISSECTION OF THE BRAIN.

The fold-stake had penetrated nearly through the right hemisphere of the brain posterior to the optic thalami; the brain

was greatly broken down, and had suppurated; the left hemisphere was perfectly sound. This case supports the opinion, that if the injury is on one side of the brain, the palsy is on the opposite side of the body.

A case of extensive extravasation of blood in the optic thalami, producing blindness.

—— Carter, ætat. 40, or thereabouts, became suddenly blind from a fit; his pulse was remarkably slow, and his pupils obstinately contracted; he became very deaf, soporose, and in three days he died: I bled him several times during this period.

DISSECTION OF THE BRAIN.

Four ounces, at least, of fluid and congealed blood were situated upon the optic nerves and in the thalami; the brain was much broken down by the grumous blood.

The result of my dissections of diseases of the brain producing blindness is, that the pupil will generally be found dilated in hydrocephalus and tumours, and that it will be more frequently contracted when the blindness is occasioned by the effusion of

blood; but this must be received as a general observation, since there are exceptions.

A case of blindness supposed to be occasioned by a fracture of the basis of the skull.

Stephen Hulcup, a postboy, ætat 25, was thrown from a horse and dragged along the ground by the stirrup; when taken up he was perfectly senseless, and the blood flowed profusely from his ears: he was not conveyed to the infirmary till three days after the accident: when I saw him, the pupils of his eyes were greatly dilated, and he was perfectly blind: no other part of his body was paralyzed. Several months have elapsed since the receipt of the injury, and his sight is so far recovered with the right eye, as to enable him to distinguish large objects, but the left is little improved.

The following remarkable cases are noticed by Bonetus in his *Sepulchretum*.

Cæcitas inducta a tumore steatomatica, cerebri.

Amaurosis a contortione nervorum opticorum producta.

Cæcitas a nervis opticis crassifactis et fragilibus.

He also takes notice of an hydatid, containing half a pint of serum, pressing on the optic nerves; likewise of calcareous matter situated on the optic nerves, and producing blindness.

Mangetus, in his *Bibliotheca Medicopractica*, mentions privation of sight produced by extreme cold, and relates an instance of blindness occasioned by epilepsy during parturition*.

* It would be an act of injustice not to mention that Mangetus was in the habit of recommending the excision of the superfluous granulations when escharoticks failed; his words are, "Si his aut similibus no absumatur, caro est operatione chirurgica auferenda;" and his experiments prove that he was acquainted with the reproduction of the aqueous humour.

OF DISEASES OF THE RETINA PRODUCING AMAUROSIS.

These are, acute or chronic inflammation of the retina, terminating in its disorganization; a varicose state of its vessels, and deposits on its surface, *&c.*

Some of these affections are attended with considerable pain in the head, in consequence of the continuity of the retina with the brain, and it is by no means uncommon for this pain to cease altogether on the entire destruction of sight; and in these cases I have considered the disease as entirely confined to the retina, for it is not probable that the disease would be arrested if seated in the brain.

The retina, as I have described before, has been found converted into a shell of bone; and the diseases of the choroid, vitreous humour, and membrana hyaloidea, will occasion organic disease in the retina. It is rarely that an opportunity offers of dissecting the eyes of an amaurotic person,

wherein the disease has been confined to the retina; but I am inclined to think that the diseases of the vitreous humour and choroid are more frequently the cause of amaurosis than is generally suspected. The retina, in common with other structures, is subject to fungous hæmatoides and cancer, and a morbid collection of serum has been observed between it and the hyaloid membrane.

The treatment of amaurosis should vary according to the cause which produces it, and it is this that has occasioned such discrepancy of opinions as to its mode of treatment; for instance, if the disease is occasioned by the effusion of blood in the brain, the principle should be to promote its absorption by bleeding, an abstemious diet, diaphoreticks, and keeping the bowels regular. This species of amaurosis is more frequent in elderly people, who are most subject to apoplexy. The period of recovery will vary exceedingly, and depend on the quantity and situation of the effused blood, as well as on the rapidity of its absorption. When people are very old, the power of the

absorbents is so weak, that they seldom recover their sight. I have met with repeated instances of patients recovering, but the practitioner should give a guarded prognosis. When amaurosis is occasioned by hydrocephalus, or tumours in the brain, the prognosis should always be unfavourable, since these diseases, in all probability, must have advanced far beyond the bounds of human relief when they have occasioned blindness; and the dissection of the previous-mentioned cases justify this conclusion. If amaurosis is produced by disease of the choroid coat, of the vitreous humour, or from retinitis, deposit on the retina, or a varicose state of the vessels, then these diseases should be the immediate object of our attention.

OF THE STRUCTURE OF THE VITREOUS HUMOUR AND ITS DISEASES.

THE vitreous humour, so called from its resemblance to melted glass, commences at the entrance of the optic nerve into the globe, and extends to the edge and posterior surface of the crystalline lens: its figure is convex posteriorly and on its sides, but anteriorly it is flattened, and a little concave, corresponding to the convexity of the posterior surface of the lens which it receives: it occupies the posterior cavity of the globe, between the retina and crystalline lens, and is beautifully transparent in the adult, but of a reddish colour in the fœtus: it resembles, in consistency, very thin transparent mucus, which is contained in cells, and is rather salt to the taste. The whole of the vitreous humour is contained in a transparent capsule, termed membrana hyaloidea, aranea, et tunica vitrea. This membrane is situated beneath the retina,

but does not adhere to it: the capsule sends down processes from its under surface into the substance of the humour, which form cells, and communicate with each other. In order to shew the communication of these cells, the humour should be exposed, suspended, and punctured, when the whole contents will drip gradually out at the opening. Beneath the corpus ciliare the capsule sends off a fine lamina, which is inserted into the anterior capsule of the crystalline lens, a little anterior to its edge, which thus connects the vitreous humour with the lens. The capsule of the vitreous humour also passes behind the posterior proper capsule of the lens, from which it is with difficulty separated, except in disease. The canal of Petit is a canal surrounding the lens a little anterior to its edge, and is formed by the previous-described lamina which is sent off from the vitreous capsule: this canal is perfectly empty, and is intersected by cellular matter, so that on inflation its intersections become visible.

The vitreous humour is nourished by an artery sent off from the arteria centralis re-

tinæ, which in the fœtus is distinctly visible, penetrating the centre of the humour, and distributing its branches on the posterior capsule of the crystalline lens. These vessels are beautifully demonstrated by Loder, Sœmmering, Dumoirs, *&c.*

The use of the vitreous humour is to keep the other coats of the eye expanded and supported, and to act as a proper optical medium for the transmission of objects to the retina.

OF THE DISEASES OF THE VITREOUS HUMOUR.

The cells of the vitreous humour are frequently absorbed or broken down, and the humour itself is often rendered thin and of a red colour after the operation of couching: this state of the humour may also be occasioned by inflammation of the choroid or any of the deep-seated structures. In glaucoma the humour has undergone a change of colour, and is of a sea-green. It frequently becomes absorbed or diminished in quantity, from the pressure of tumours or other adventitious growths which have arisen from the choroid or sclerotica: on some occasions it is increased in quantity, constituting hydropthalmia. I recollect seeing a gentleman who had been couched, and who some years afterwards had an attack of anasarca; his eyes partook of the general dropsy, and were of a prodigious size.

When the needle is used very freely in the operation of couching, the capsule and cells of the humour are very apt to become opaque, and thus render all future operations useless. I have seen a case where the humour was converted into a substance resembling curd. Morgagni relates an instance of its being thick and ropy, drawing out into threads; vide Letter 58, art. 16. Bonetus mentions a case where the humours were converted into a sebaceous substance, and relates an instance of blindness occasioned by putridity of the vitreous humour, wherein a worm was discovered. Mallcarne, Blazius, Gunzius, Morand, and Walter, take notice of calcareous matter which was situated in the centre of the globe; and Scarpa, Morgagni, and Wardrop met with ossification of the capsule of the humour. Hopkinson, in the *Transactions of the Society of Philadelphia*, Vol. II, No. 18, and Morgan, in Vol. II. No. 48, notice worms being found in the eye; but this circumstance is more frequent in the horse.

The vitreous humour is frequently reproduced after its entire evacuation, instances of which I have observed in my practice. Larrey, in his relation of the expedition of the army of L'Orient, notices the restitution of the vitreous humour.

OF THE

STRUCTURE OF THE CRYSTALLINE LENS AND ITS CAPSULE.

THE crystalline lens, so called from its resemblance to a common lens, or magnifying glass, has always been described as one of the humours of the eye. It is situated opposite the pupil, behind the aqueous humour, and is received in a bed or concavity on the anterior surface of the vitreous humour: its figure is convex anteriorly and posteriorly; the former surface describing the segment of a larger circle than the latter. The substance of the lens is composed of concentric layers or lamina, which are connected by thin transparent cellular tissue, and which may be easily separated in the lenses of the largest animals. It is very probable that, in many cases of cataract, the disease commences by a loss of transparency in this cellular matter, and that when the lens is converted into a milky

fluid, these cells are broken down or absorbed: the cellular matter is best seen by drying and afterwards separating the laminæ. The laminæ encircle each other like the layers of an onion, and become more condensed as they approach the centre or nucleus of the lens: some authors notice serum being situated between these laminæ; but if there is any, it is not to be readily detected.

The lens, if macerated in water, will separate vertically into triangular portions, the sides of which are unequal, and the acute apices of the triangles meet in the centre of the lens. The convexity of the lens varies according to the age of the individual, and this observation applies to its colour and consistency. In the fœtus it is globular, extremely soft, and very vascular: in the adult it is less globular, firmer, and perfectly transparent: after thirty it decreases still more in convexity; and in old age it becomes very flat, hard, and compact, and not unfrequently of a yellow or amber colour. During the whole of these periods the magnifying power of the lens corre-

sponds to its degree of convexity. But the lens does not always undergo a diminution of its convexity, for we now and then meet with instances of elderly persons being able to see minute objects without the assistance of glasses. A recollection that the consistency of the lens corresponds to the age of an individual, has afforded me great assistance in prognosticating whether a cataract was hard or soft. As a general rule (of course subject to some exceptions), I will observe, that in infants, with congenital cataract, the lens will be found very soft; at twenty, not quite so soft; between twenty and forty, of middling consistency; and from this period to old age, it will become gradually harder: thus, in elderly people, it is generally small, but very hard. To those who advocate the operation of couching, these observations may be of some importance, since they will inform them in which cases they may expect absorption: (as, for example, in a soft lens, and in which the lens seldom will become absorbed, as in a hard lens:) they teach them that they cannot expect to depress the lens at a cer-

tain time of life, whilst they may effect it without difficulty at another.

A small quantity of serum is secreted between the surface of the capsule and the lens, and when this is increased in quantity, and altered in quality or colour, it constitutes what has been termed cataract of the liquor Morgagni.

The lens is surrounded and enclosed by a distinct and proper capsule, which is connected with the vitreous capsule, but perfectly distinct and independent of it. The capsule is thicker on the anterior than on the posterior surface, and in the sheep it is very elastic, tough, thick, and brittle; whereas on its posterior surface it is very thin, and is with difficulty separated from the vitreous capsule: the posterior surface may be shown by removing a portion of the sclerotica, when the vitreous humour and its capsule will fall out, leaving the lens enclosed in its proper capsule. Surgeons frequently speak of the depression of the lens and its capsule altogether; but this, in my humble opinion, is a very rare occurrence; for the connexion of the vitreous

capsule with the lenticular capsule renders such a separation extremely difficult; and in those cases where they have thought the capsule has been depressed with the lens, I think they have been deceived by the capsule retaining its transparency: the difficulty will be apparent in attempting it on the dead subject.

The lens is nourished by an artery sent off from the arteria centralis retinæ, which penetrates the centre of the vitreous humour, and is distributed on the posterior surface of the lens: this artery was pointed out by Albinus, and a beautiful drawing of it is given by Loder, Sœmmering, Zinn, and others: it is also nourished by vessels sent off from the ciliary processes: these vessels are best demonstrated by a minute injection of the fœtal eye, or of the eye of a calf.

OF THE

DISEASES OF THE CRYSTALLINE LENS AND ITS CAPSULE.

The crystalline lens undergoes, from disease, a variety of changes, both in colour and consistency, which are in most instances gradual. The colour or opacity of the lens varies exceedingly, and it may be either blue, white, yellow, brown, striated, or purulent: its consistency likewise varies, being found soft, hard, caseous, fluid or milky, and flocculent; and its bulk, in most instances, depends somewhat on its consistency. These are the most common deviations from transparency and consistency, but there are others less frequently met with. I once performed the operation for artificial pupil, and found the lens converted into a substance resembling lime in colour and consistence. Walter, page 54, takes notice of the following case: (Vir excellentissimus Pallas) in concrementum

terrestre durum permutatum conservat. Wardrop, in his valuable book on the *Morbid Structures of the Eye*, relates a case of ossification of the lens, which, when sawn through, was of a brown colour, dark, and hard in the centre. Pechlin notices the lens being deformed; Heister its being converted into a stony matter; and Haller its being ossified: sometimes it has been found double. The lens varies also in degrees of transparency: the nucleus of the lens is frequently opaque, and its circumference transparent: these cases generally remain stationary, and as the patients enjoy tolerably distinct vision, they should not be operated on. I have seen the lens striated with alternate streaks of transparency and opacity: in elderly people I have observed the edges opaque, and the centre perfectly transparent; the sight in these cases, although defective, is tolerably good. The liquor Morgagni is frequently increased in quantity, and altered in quality or transparency.

OF THE

DISEASES OF THE CAPSULE OF THE LENS.

THE capsule of the lens is subject to most of those diseases which are incidental to transparent structures, and amongst the foremost of these may be enumerated opacity of it. This may either be partial or total, and it may observe all the different shades or gradations of colour, from a light-blue tint to a pearly whiteness: no age is exempt from it. A partial opacity of it is frequently met with in infants, in the form of a small white spot, about the size of a pin's head, which occupies the centre of the pupil: the transparent cornea reflects it, and gives the appearance that it is situated in the body of the lens: this disease does not much obstruct vision, is generally stationary, and therefore should never be operated on. This partial opacity is frequently met with, presenting almost every

form that the imagination can suggest, sometimes beautifully spotted, at others presenting alternate spots, waves, or streaks, with transparent intermediate spaces: these, in some instances, are perceptible even to the individual himself; and I recollect a patient sketching on paper a representation of what he saw, which exactly corresponded to the appearance which the capsule exhibited when the eye was under the influence of belladonna. The propriety of an operation under these circumstances should depend on the degree of transparency and the perfectness of vision. Let it be kept in mind, that if an operation should be determined on, the lens, although transparent, would be inevitably destroyed; therefore, in a case like this, it would be prudent to compare the disadvantages arising from the loss of the lens, with the partial opacity of the capsule; what I mean is, would the sight be more perfect after the extraction of the lens and its opaque capsule, than it would if no such operation had been performed? For my own part, if the sight was tolerably perfect, I should

certainly avoid an operation; but if the opacity was so extensive as to deprive the patient of a degree of sight sufficient for the common purposes of life, I should then recommend one.

OF VASCULAR OR INFLAMED CAPSULE.

THE capsule of the lens is frequently the seat of inflammation and its effects, opacity and deposit. In these cases the pupil is generally contracted and adherent, and delicate red vessels, which proceed from the margin or body of the iris, may be seen traversing the surface of the capsule. This state of membrane is a common consequence of primary, secondary, and venereal iritis or choroiditis, to which complaints I must refer my reader. It frequently succeeds unfortunate attempts at depressing the opaque lens, and is occasioned by the inflammation excited in the choroid and iris being communicated to the capsule of the lens, and thus obliterating the pupil. The old operation of couching fails more from this circumstance than from any other, which is only to be remedied by the formation of an artificial pupil at some subsequent period. I need not observe that the bare contemplation of an opera-

tion on an eye, under these circumstances, should be discarded, and a more favourable opportunity selected, when all disease has subsided, and the organ has become perfectly quiet. This state of vascular capsule I have also observed in gouty subjects, and it occasionally happens after the operation of extraction. Mercury, judiciously exhibited, is the best remedy for it.

In cases of congenital cataract, it has been ascertained, that the lens is almost always removed by spontaneous absorption, and that the anterior layer of the opaque capsule recedes on its posterior surface, so that in most cases of congenital cataract, when the operation is not performed soon after birth, the opaque capsule is all that the operator has to deal with, which should always be destroyed in its centre. The whole anterior portion of the capsule of the crystalline frequently becomes opaque, and it varies in its degree of opacity; in these cases, the imperfection of vision corresponds to the opacity; thus when the capsule has assumed merely the first shade from perfect transparency, the sight of the

individual will not be materially impaired; and it is not at all uncommon to meet with instances, where the capsule has assumed a deepish blue colour, and still the patients *continue* to enjoy tolerable sight; they describe all objects appearing of a blue colour, as if they were viewing them through a coloured glass, or medium. Should even this degree of opacity remain stationary, in my opinion no operation should be performed. Where the whole anterior portion of the capsule of the lens is opaque, and of a pearly whiteness, which state must necessarily be attended with blindness, no doubt can possibly exist of the propriety of an operation; and as the removal of the capsule, as I have observed before, will be followed by opacity, and destruction of the lens itself, the operation most to be depended on in middle aged, or elderly subjects, will be extraction of the opaque capsule, and the contained lens. In infants or children, the anterior or posterior operation should be performed.

Wardrop, Dumoirs, and several authors, take notice of a conical deposit on the cap-

sule of the lens, which projected into the pupil; the base was situated on the capsule, the apex turned towards the pupil. Wardrop observes, that the several portions of the capsule, that is, the posterior portion of the capsule of the lens, will separate in disease from the vitreous capsule, and thus the lens contained in its proper capsule will float about in the eye, constituting what has been termed floating cataract. Lastly, the capsule is now and then the seat of ossific and calcareous deposit, which may be either partial or entire.

OF THE AQUEOUS HUMOUR, AND ITS MEMBRANE.

The membrane of the aqueous humour is taken notice of by Loder, and a partial dissection of it is given in Table 56, Fig. 12, of his work, but he merely describes it as lining the inner surface of the cornea, whereas it is reflected over the anterior surface of the iris, and, passing over its pupillary edge, lines the posterior surface of this membrane, or uvea, and is then continued over the front of the crystalline lens, forming the anterior or pupillary portion of the capsule.

Wardrop, in his *Morbid Anatomy of the Eye*, has given a very accurate description of this membrane, which partakes of the character of a serous membrane, whose office is to secrete the aqueous humour, in the same manner as the pleura, peritonæum, and pericardium secrete a fluid in their cavities: it is subject to the same diseases, namely, inflammation, suppuration, change

of structure, effusion of lymph, and loss of transparency, adhesions, and even ossification. During high excitement, red vessels may frequently be observed traversing its corneal and pupillary surface; the former attends inflammation of its corneal surface, the latter more frequently accompanies iritis. If the corneal surface is inflamed, it appears cloudy, with partial spots of opacity in it; if it suppurates, it ulcerates internally, and thus constitutes hypopion. Change of structure, loss of transparency, and adhesions, are frequently produced in it by the effusion of coagulable lymph or albumen, which may be situated on its corneal surface, or capsule of the lens, or on the surfaces of the capsule and edge of the pupil, and produce by their union obliterated pupil; or an adhesion may exist between its corneal surface and that of the iris, in the same manner as between the pleura costalis and pulmonalis: flakes of lymph are also frequently effused from its surface into the aqueous humour, in the same manner as from the surfaces of the pleura, pericardium, or peritonæum, which

in most instances become absorbed. Lastly, its corneal surface has been found converted into a shell of bone, and ossific deposit has been frequently observed on its pupillary surface.

The aqueous humour is secreted in the space between the cornea and capsule of the lens: this space is divided into two portions, called chambers: the anterior of which is situated between the cornea and iris, and is the largest of the two; the posterior is situated between the iris and capsule of the lens: the humour is as transparent as water, rather viscid or tenaceous, contains a little salt, and is about five drops in quantity: in the fœtus it is red and turbid; its use is to defend the more important parts of the organ, as the iris and lens, and to facilitate their motions, whilst it serves to keep the cornea distended, and by its transparency and form collects and transmits the rays of light to the interior of the eye. When evacuated by puncture, it is quickly regenerated, for the cornea will be found re-distended in the course of forty-eight hours: from this circumstance we may in-

fer, that the membrane of the aqueous humour has, in common with all other serous membranes, a secreting and absorbing surface, so that a constant mutation of the fluid is going on; thus, that which it secretes to-day is absorbed in a given time, and re-supplied by a fresh secretion; so that it is absolutely necessary for the perfection of the organ, that the secreting and absorbing powers should be duly balanced. It is this mutation of the fluid that appears to me to have given rise to the prevailing opinion of the great solvent properties of the aqueous humour, though it may possess this quality in addition, since instances are on record of portions of steel, from accident, breaking into the anterior chamber, and becoming absorbed. The aqueous humour in these cases was observed to become turbid, or of a rusty colour, and gradually to recover its transparency. When a foreign body, as a portion of lens, or any other substance, is projected into the cavity of the aqueous membrane, it immediately acts as a stimulus to the absorbents, which instantly commence, and progressively effect,

its removal: sometimes its presence produces a high degree of excitement in the aqueous membrane, which may occasion lymph to be thrown out, which may form an adventitious capsule around it, but even in this case it will be frequently removed. When the exhaling and absorbing powers are not duly poised, dropsy in the aqueous cavity will be the consequence; how far conical cornea is a disease of this description, I am hardly at present prepared to say; I am inclined to think that this disease arises from a tenuity of this coat. Blood is frequently effused into the aqueous cavity from blows on the eye, or wounds of the iris, but this becomes rapidly absorbed. Finally, the aqueous humour will become turbid from disease of its membrane, or from the effect of disease in some other structures of the organ; hence it is common in ophthalmia, iritis, fungus hæmatoides, *&c.*

OF THE OPERATIONS ON THE EYE.

HAVING treated of the principal diseases of the organ, I shall now proceed to point out the cases of cataract proper to be operated on. The operation may be expected to succeed when the patient can perfectly distinguish light from darkness; when he has not been afflicted with distressing headachs, accompanied with inflammation in his eyes; when the form and motions of the pupil are perfectly natural, and the globe of the eye is sound, and free from blemish or disorganization. Whereas the operation is almost inadmissible, when the patient has been long troubled with obstinate and continued headach, accompanied by severe pain and inflammation of his eyes, and with great intolerance of light, and more especially if this condition has existed for some time; when the diseased eye is preternaturally large, or hydropick; or on the contrary, unnaturally small or atrophick;

when the cataract is combined with amaurosis, or when it is accompanied with disease of the vitreous humour, as in glaucoma*.

The operation is attended with some difficulty and uncertainty, when the patient distinguishes light from darkness in an indistinct manner, or not at all; when the cataract is very adherent to the iris, and the pupil is obliterated; when it has been attended with violent headach and severe ophthalmia, when the patient is of a cachectick, or bad habit of body; or when a considerable portion of the cornea is opaque with varicose vessels.

* Hard drinkers are unfavourable subjects for extraction or depression, as the subsequent inflammation is frequently violent. On such patients the greatest delicacy is required in the use of instruments.

OF THE

TREATMENT PREVIOUS TO AN OPERATION.

For two or three days previous to an operation, the patient should adopt a less nutritious diet than usual; he should carefully avoid costiveness, or whatever may occasion irritation or disturbance in the alimentary canal: if he should be of a plethoric habit, and has accustomed himself to be bled, a vein should be opened a few days previous to the operation; (some surgeons recommend cupping on the shoulders or neck); the bowels should be well cleansed from feculent matter by a gentle purgative, and when the patient is bilious, a mercurial preparation should be preferred. I have observed, that all those tedious preparations, which some surgeons make use of, previous to an operation, in order to prevent the inflammation which follows it, are not only useless, but, in many cases, pre-

judicial. If the patient is timid, a few drops of laudanum should be given him, but all unnecessary preparations and parade should be avoided.

OF THE

IMPROPRIETY OF SPECULA.

THE use of specula has occasioned more mischief, and created more failures in the operation of extraction, than any other instrument with which I am acquainted, and it is my intention to dwell longer on this subject, in order to convince my readers that those surgeons who make use of them in the operation of extraction will generally fail. The most eminent oculists seldom, if ever, use them; whilst others, who are not in the frequent habit of operating on the eye, from a want of confidence in themselves, constantly adopt them. I shall presently shew, that the fingers alone of the operator are adequate to command every motion of the globe. The evils arising from the use of specula may be enumerated in the following order: they render the eye irritable, and occasion a spasmodic action of the palpebral muscles and those of

the globe; the cornea knife is thus introduced into the eye under the most unfavourable circumstances, for the organ cannot be too quiet.

A speculum prevents in various ways the accurate punctuation of the cornea, and if perchance the cornea knife should not be made extremely correct, it will occasion the aqueous humour to escape before the opposite punctuation is completed, that is, before the knife pierces the opposite circumference of the cornea; the iris losing its support, instantly advances before the edge of the knife, and is inevitably wounded: it frequently causes the patient to roll his eye rapidly towards his nose, and to turn it under the orbit, thus obscuring the upper portion of the cornea from view, and requiring the punctuation to be completed in the dark; this is extremely hazardous and distressing, for the surgeon cannot tell where the knife is going. The pressure produced by it during the passage of the knife will frequently occasion the rupture of the capsule of the lens; the lens being set at liberty, immediately bulges into the

pupil, carries before it the iris, which falls under the edge of the knife, and I have actually witnessed a portion of the inferior pupillar border cut away, and escape at the wound in the cornea; in these cases, the opaque lens absolutely rushes out through the opening.

If the speculum is retained in the eye whilst completing the section of the cornea downwards, the iris will be generally wounded, therefore if it is used, it should be removed the instant the knife penetrates the opposite side of the cornea, and the section downwards completed without it, for the knife will be found to command every motion of the globe. The pressure of it will often occasion a rupture of the vitreous capsule and the escape of its humour; so that on every attempt to examine the eye after the extraction of the lens, in order to ascertain if any opaque portions remain behind the pupil, particles of the vitreous humour will escape at the wound; this tendency to the escape of the vitreous humour I have noticed, till the wound in the cornea had entirely healed.

I have observed, that when a speculum has been used, the wound in the cornea has not so readily healed, and the lips of it do not so accurately approximate, but gape asunder; by making use of it the surgeon is deprived of one hand, which is a circumstance of material importance, since his left hand is not at liberty to correct any accidental circumstance that may occur during the operation; for instance, should the iris be involved under the edge of the knife, he has not his left hand at liberty to disengage it. When the iris is very convex, and the anterior chamber in consequence very narrow, it is hardly possible to use a speculum without wounding it, and if it should so happen that the vitreous humour from disease is rendered thin, and its cells broken down, the greater part of it will be evacuated, and the globe will sink in the orbit. Lastly, I have remarked, that from its use the subsequent inflammation of the organ is more violent, the wound in the cornea does not heal so readily, the cicatrix is frequently irregular, and the globe of the eye is

bruised. If, notwithstanding what I have said on the subject, a speculum should be preferred, the silver one of Pellier is the best and most manageable.

OF THE CORNEA KNIVES.

An operator, however dexterous and successful, should never despise examining the instruments which his head and hands are to direct. The knife should be of proper length and breadth, and correspond to the diameter of the cornea: it should increase in thickness gradually and almost imperceptibly, so as to fill up completely the opening as it advances, and thus prevent the escape of the aqueous humour: its point should be sharp, accurate, and free from rust; and there should be knives of various sizes, so that the surgeon may accommodate himself according to the different diameters of corneas.

Respecting the preference of one knife to another, I will observe, that Wenzel's, Richter's, and Ware's knives are very good ones, all well adapted to the object in question: the broadness of Richter's knife enables its edge to pass below the margin of

the pupil before it punctures the opposite side of the cornea, a circumstance of importance, as it thus avoids wounding the iris. Professor Beer's knife, which is of a triangular shape, and much advocated, I have also frequently successfully used; but the shape of this knife requires it to be used in a different manner from either of the former; and I shall show that the form of this knife prevents it from executing the section of the cornea with the same mathematical precision as either of the former: the knife being triangular, of course cannot make a semicircular incision, so that it is objectionable on account of not making that form of aperture which is most desirable. The intention of the triangular shape is, that the knife may make the section downwards in its passage across the cornea. I sometimes make use of a knife, the breadth of which corresponds to the semi-diameter of the cornea; it has a cutting edge below, and at its back, for half the length of the blade: this knife, by cutting upwards as well as downwards, makes, what is so very desirable, a large opening in the cornea for

the ready escape of the lens. The point of the knife, when once introduced, should never be withdrawn, as this would occasion a want of correspondence between the opening and the knife (blocking it up), and the aqueous humour would immediately escape; this would render the cornea flaccid, and oblige the operator to postpone the operation till some future period, or to enlarge the wound with the scissors or knife, Should the operator persist after this accident, the iris will certainly be wounded.

OF THE

POSITION OF THE PATIENT.

If the left eye is to be operated on, the patient should be seated on a low chair, with his head turned obliquely towards the window; the assistant, whose office it is to elevate the upper eye-lid, should support and steady the patient's head on his breast. The operator should be seated in front on a higher chair, and his right foot placed on a footstool, so that his knee may support and steady his elbow and arm. If the right eye is to be operated on, (as few surgeons are ambidexter) the patient should be seated on a hassock or ottoman, and the operator seated behind on a high chair or stool, his foot resting on a footstool, as previously described: the operator, in this instance, may support the upper eye-lid, and command the motions of the globe himself, if he should prefer it: if an assistant elevates the lid, he should stand on the oppo-

site side. Another position, extremely favourable and convenient for the operation, is, placing the patient on his back on a table, his head lying on a pillow: the operator, in this position, seats himself behind the patient: by this method I have frequently operated on each eye with my right and left hand, without moving my patient.

A surgeon will acquire great dexterity in the management of the globe, who constantly accustoms himself to remove all extraneous substances sticking into and imbedded in the cornea, without the assistance of a speculum.

OF THE

MANAGEMENT OF THE GLOBE.

If the left eye is to be operated on, the assistant standing behind and on the opposite* side, is to draw up the skin of the forehead and elevate the upper lid with two of his fingers, allowing the points or extremities of them to graze or dwell gently on the sclerotic conjunctiva, one finger being situated about the centre, the other a little more laterally on the nasal angle of the eye: the surgeon seated on a high chair, with his fore and middle fingers gently depresses the inferior lid a little below the inferior border of the cornea, and places his third finger gently on the sclerotic conjunctiva at the inner and inferior side of the globe. The whole of the cornea is thus exposed

* In summer I generally prefer the temperate soft light of the evening for performing the operation, as afterwards the patients are apt to fall asleep, which prevents the eye from being disturbed.

to view, and the eye is now in a state for the introduction of the knife. The operator is now gently and steadily to introduce its point through the cornea about half a line from its junction with the sclerotica, considerably above its transverse diameter; I have made use of the word considerably, because I attribute the greater proportion of failures in this operation to a parsimonious opening. The operation will generally fail when the opening is made too small, but I never yet saw an instance of failure from the opposite extreme, and in this particular it exactly corresponds to the operation of lythotomy. In order to impress this observation strongly on the minds of young operators, I will remark, that the mischief arising from wounding the iris is absolutely trifling in comparison to the disadvantages and disasters which will inevitably arise from a small opening in the cornea. I have seen, as I have before remarked, a piece of the pupilary margin of the iris absolutely sliced out, and yet the patient has recovered her sight; but do not suppose I mean to advocate wounding

the iris, I tell it you merely that you should not be too much alarmed at the accident.

The cornea knife having penetrated the anterior chamber, is to be passed steadily and firmly onwards on a parallel plane with the iris till its point reaches the opposite side of the cornea, which it is to penetrate at the point corresponding to the one at which it entered*: should the patient roll his eye towards the nose before the point of the knife reaches the opposite side of the cornea, let the blade dwell, and direct him to look outwards; in this manner you will effect the opposite punctuation of the cornea with the greatest accuracy and facility.

The instant the point of the knife has penetrated the inner border of the cornea, the management of the globe should be intrusted entirely to the knife; all pressure should be removed, and the section of the

* Some operators find a difficulty in executing this part of the operation correctly; but if they direct their eye to that part of the cornea where the inner punctuation should be made, the point of the knife will be sure to follow. Boxers and sportsmen are well acquainted with this circumstance.

cornea downwards completed either by pressing the blade of the knife gently and steadily downwards, or by drawing it backwards, and thus executing the section by a clean back stroke*.

It occasionally happens that on the escape of the aqueous humour, the iris, from losing its support, falls before the edge of the knife, and can only escape being wounded by giving it artificial support; the point of one finger or more of the operator, when this accident happens, should be placed on the cornea over the blade of the knife, and the section downwards completed whilst in this situation, or the iris may be disengaged by gentle friction of the cornea with the finger. In passing the outer border of the pupil, care should be taken that the point of the knife does not dip into the posterior chamber and puncture the capsule of the lens, for if it should, the lens would be set

* I am in the habit of giving the point of the knife a slight inclination upwards in its passage, so that the inner punctuation of the cornea is situated higher than the outer; by this manœuvre the wound in the cornea is rendered larger for the more ready egress of the cataract.

at liberty, and bulging into the anterior chamber, would carry the iris with it, and thus occasion its being incised. Baron Wenzel advocates the puncture of the capsule in this manner, but the practice tends to no good, may be productive of much mischief, and will embarrass many operators.

A narrowness of the section in the cornea may be produced in various ways; first, the point of the knife may slip between the laminæ of the cornea, and thus not enter the anterior chamber near its junction with the sclerotica: this is occasioned by the point of the knife being directed too forward. Secondly, it may be occasioned by the point of the knife piercing the inner border of the cornea lower than the point at which it entered, hence there will be a smaller segment of a circle. Thirdly, the dimensions of the incision will be considerably reduced by giving the edge of the blade too great an inclination forwards in the section downwards: this is sometimes practised by young surgeons from a fear of wounding the iris, but should be avoided,

since it places the cicatrix nearer the pupil, and is thus injurious to vision. Care should be taken that the inner punctuation of the cornea, and the section downwards does not verge on the sclerotica, as in either case the ligamentum ciliare or choroid would be wounded, and a prolapsus of these parts produced.

The section of the cornea being completed, a napkin is to be lightly placed over the eyes, and the patient allowed to recover from the fright of the operation; in a minute or two the lower eyelid is to be gently depressed, and the gold needle or point of the curette cautiously introduced under the flap of the cornea; the centre of the capsule of the lens should then be punctured, when the opaque lens being set at liberty, will almost spontaneously escape, provided the opening in the cornea be of sufficient size*: if it does not readily follow, it may be gently assisted by a slight degree of pressure on the inferior eyelid,

* In puncturing the capsule of the lens, the operator should carefully avoid wounding the capsule of the vitreous humour.

which assists in raising its edge above the inferior border of the pupil. Sometimes the opaque lens will sink into the vitreous humour below the inferior border of the pupil: in this case one or two fingers of the operator should press gently on the inferior portion of the globe, so as to elevate the lens above the margin of the pupil; it is then to be laid hold of with a fine cataract hook, and extracted: this is more likely to happen when the vitreous humour is dissolved.

The cataract being removed, and the wound in the cornea properly adjusted: if one eye only is operated on, I generally cover it, wait a few minutes and again examine it, in order to ascertain if any opaque matter remains behind the pupil: if the other eye is to be operated on, I proceed to do this, and finally examine them both before the dressings are adjusted. After the section of the cornea is completed, I cautiously avoid elevating the upper eyelid as much as possible, as this causes the wound in the cornea to gape, and gives it a disposition to do so after the operation.

OF THE

MODE OF ENLARGING THE WOUND IN THE CORNEA WHEN IT IS TOO NARROW.

This is a very unpleasant accident, and the wound in the cornea should be enlarged either with a pair of fine blunt-pointed scissars, or with a small thin knife with a probe-point; either of which should be introduced at the outer border of the wound; or the opening, if preferred, may be enlarged on either side, special care being taken to avoid wounding the iris: I prefer the curved scissars, as they are more manageable.

The collapsed state of the cornea renders caution necessary, in order to complete the section without wounding the iris, which in these cases is often forced by the cataract between the lips of the wound:

the vitreous capsule is also subject to be ruptured by this accident, so that portions of its humour escape, and occasion the lens to sink below the pupil.

OF THE

ADJUSTMENT OF THE CORNEA, AND DRESSINGS AFTER THE OPERATION.

THE inferior eye-lid should be gently depressed, and the wound in the cornea examined, in order to ascertain if its edges are accurately in contact; if not, they are to be adjusted either with the finger or the blunt end of the curette, and as the agglutination of the cilia is apt to occasion confinement of the tears and matter, and to give considerable pain in opening the eye, when fresh dressings are to be applied I make use of a small quantity of oil to prevent it: the dressings cannot be too light and easy, and pressure on the globe should be avoided; both for the comfort of the patient and convenience of the operator: in fact, you may undo all by an improper application of the dressings and bandage. I generally make use of a piece of lint about four fin-

gers' breadth, and a finger's length; the upper portion of this is moistened in water and applied on the forehead just above the eyebrow, the lower dry portion falls lightly over the globe: over this the bandage is applied, which consists of a fold of linen, a hand's breadth and a half wide, and a hand and a half long: to the upper surface of this a roller of moderate breadth is sewn, so that the pressure of the roller falls on the forehead, and the linen lies loosely over the globe, and thus admits of being thrown back at any time for the application of dressings, or fomentations.

OF THE

CONSEQUENCES WHICH MAY OCCUR FROM WOUNDING THE IRIS.

When the iris is wounded it is generally followed by effusion of blood into the anterior chamber; this effusion is sometimes in such quantity as to occasion the wound in the cornea to gape, but in the course of a few hours this is absorbed, and thus rectifies itself.

The iris, when wounded, now and then becomes staphylomatous, and adheres to the wound in the cornea; the pupil is then irregular, and does not possess the power of contraction and dilatation.

The accident most to be apprehended from the iris being injured is, the capsule of the lens becoming opaque, which now and then happens, and which is occasioned

by the inflammation of the iris being continued to the capsule: the pupil also sometimes becomes obliterated from a wound of the iris.

OF THE

TREATMENT OF THE PATIENT AFTER THE OPERATION.

THE patient should lie on his back the first few days; his diet should be of the most slender kind, and consist of liquid nourishment, given him through a convenient medium, in order to prevent the slightest motion of the face and eyelids, which might disturb the wound in the cornea.

Should the eyes ache much a few hours after the operation, a full bleeding should on no account be omitted, and repeated early if it should continue; but I would have the operator inquire if fainting or vomiting is apt to be occasioned by bleeding from the arm, if so, leeches should be preferred. The operator should inquire occasionally if there appears to be any thing in the eye, as the answer in the affirmative will infer that the edges of the cornea are displaced, or that the iris has protruded be-

tween the lips of the wound, either of which accidents should be immediately remedied. No application relieves the aching, soreness, tenderness, and stiffness of the globe and lids, and contributes so much to the healing of the wound, as tepid fomentations of warm water in the winter, and cooling applications in the summer, but during their application the lids should be closed, and pressure carefully avoided. On the second or third day the bowels should be well opened by a saline purgative. The dressings should be renewed every day, taking care to depress the lower eyelid, and to avoid elevating the upper one. The chamber of the patient should be kept cool, and the light properly regulated; it should not be too dark, but rather a subdued light; the surgeon from eager curiosity should not expose the eyes too early. The healing of the wound in the cornea is accomplished by the vessels of the conjunctiva, and the proper vessels of the cornea, which at this period carry red blood for the purpose, so that the eyes must be expected to be irritable till the wound is healed; when this object is effected, they

contract to their natural size. The healing takes place by coagulable lymph being secreted at the edges of the wound; that which is superfluous is removed by the absorbents, so that the cicatrix represents a mere line, unless a portion of the cornea has been destroyed by sloughing, when the opacity is more extensive. The time required for the healing of the cornea varies in different individuals, and will depend on a variety of circumstances, amongst which should be enumerated the adroitness or non-adroitness of the surgeon in executing the operation.

It will frequently be healed on or soon after the fifth day, and rarely exceeds a fortnight or three weeks. I make it a point never to expose the eyes, until the wound is healed, on the principle that the organ is not in a state to be exercised, as it is still under the influence of derangement. When the eyes are first exposed, the soft light of the evening should be preferred; the patient should be provided with a shade lined with yellowish green silk. If the wound in the cornea does not heal kindly, it may be as-

sisted by pencilling it with a weak solution of nitrate of silver daily; but for my own part, I never found even this necessary, and would caution the surgeon against all irritating applications, as being dangerous in the extreme. I am aware that they are much advocated in protrusions of the iris, and in these cases I sometimes use the solution above mentioned; but it should be done cautiously, lest it occasion inflammation of the iris, and opacity of the capsule of the lens, which I think it is apt to do. Lastly, the patient should be provided with a pair of suitable convex glasses, but they should not be used till the eyes are quite recovered; it sometimes happens, when the patient is young, and the eye very convex, that artificial lenses are not required.

I have selected a few out of the numerous cases I have operated on during an extensive practice of ten years, the narration of which may not be unacceptable to my readers.

Case I.

In 1815, I was consulted by Mrs. Reed, an elderly lady of Winchendon, Bucks, who

had been blind several years; the lens of each eye was opaque. I removed them in the manner previously described, and she recovered her sight: with her glasses, she had no difficulty in reading her newspaper.

Case II.

On January 11th, 1818, John Akers of Windrush, ætat. 14, was admitted into the Radcliffe Infirmary, being blind from cataracts. I performed the operation on both eyes, and on April the 2nd he was discharged cured.

Case III.

On the 19th of April, 1818, Sarah Lines of Winston, ætat. 28, who had been blind from cataracts eight months, was operated on by me, and on May the 28th she returned home, having recovered her sight.

Case IV.

In 1820, I was consulted by Elizabeth Hollister of Clifton Foliat, ætat. 36, who had been blind one year; the lens of each

eye was opaque; these I removed, and she returned to her usual occupations.

Case V.

In 1822, I was consulted by Mr. Loughton, who lived in the neighbourhood of Reading, and who had been blind a considerable time from cataract in each eye: he was anxious to have the operation performed at home, I therefore complied with his request; extracted the opaque lenses, and remained with him till the following morning: about three months afterwards, he drove himself down in his gig to thank me for the benefit he had received, and to inform me how well he could see.

Case VI.

In August, 1823, Mary Garlick, of Cholsley, ætat. 21, was admitted into the Radcliffe Infirmary under my care, being afflicted with blindness from opaque lenses. I extracted them both in the presence of Dr. Williams, and on the 13th of November she was discharged, being able to read.

Case VII.

In 1818, I was consulted by Mrs. Dell of Speen farm, near West Wycomb, who had been blind twenty years, and was the mother of several children, the two last of which she had never seen. I removed the opaque lenses a few days afterwards, and she recovered her sight so completely as to be able to read her Bible.

OF

SMALL OR QUARTER SECTIONS OF THE CORNEA, WHICH HAVE BEEN RECOMMENDED FOR SOFT CATARACTS.

This operation consists of introducing the cornea knife, as in the operation of extraction, and bringing it out so as to make a smaller or quarter section of the circumference of the cornea. It was, I believe, first suggested by that eminent and distinguished surgeon Mr. Travers, who, in my humble opinion, has written the best modern work on ophthalmic surgery. The operation is founded on the power of discriminating between soft and hard cataracts. The section in the cornea being made, the opaque lens is to be broken down, and its evacuation solicited at the opening, by the point of the curette. I am much afraid that even a soft cataract will not escape at so small an opening, without materially disturbing the organ; and, for the reasons before mentioned, I always prefer the entire section, as previously described.

AN

INQUIRY INTO HOW FAR THE VIEWS OF THE OPERATOR ARE ASSISTED OR NOT, BY THE USE OF BELLADONNA IN THE OPERATION OF EXTRACTION.

The dilatation of the pupil certainly exposes the whole field of the cataract to view, and enables the operator to trace the course of his knife in its passage through the cornea more correctly; but after making the opposite punctuation, the iris contracts, and is apt to be wounded in the section of the cornea downwards: it is very probable that in this contraction the iris is more likely to fall before the edge of the knife than in its natural state.

The unsupported state of the lens, also somewhat disposes to this accident; for by the action of the muscles of the globe, its capsule may be ruptured, and the lens being set at liberty, may occasion, by its protrusion, a wound of the iris. I, therefore,

prefer operating without it. When the iris is very convex, and the anterior chamber consequently very narrow, I have thought it useful*.

* It certainly should not be omitted after the operations of extraction, depression, solution, or for artificial pupil, as in the event of lymph being subsequently thrown out, a permanently dilated pupil is preferable to a contracted one. In some instances, when I have not wished to disturb the eye after an operation, I have given it internally, and with good effect, but caution is required in administering it.

OF

ADHERENT CATARACT WITH CONTRACTED OR OBLITERATED PUPIL.

THE section of the cornea should be made, as in the operation of extraction; the point of the curette or needle should then be introduced, and an attempt made to free the iris from its adhesions to the capsule of the lens: if these should be of long standing, they can seldom be broken down; if the operator succeeds in breaking them down, the lens will advance through the pupil, and escape at the wound in the cornea: the eye should then be examined, and if opaque portions, either of lens or capsule, remain behind the pupil, they should be removed. If the iris should not act so as to leave a full and open pupil, I would recommend the division of its fibres. The operator will so rarely succeed in breaking down the adhesions, that, in most instances, it will be better, when the section of the cornea is completed, to introduce one blade of Mau-

noir's pointed scissars through the fibres of the iris, about a line from its root, (that is close to its corneal circumference,) the point of the scissars should then be pushed gently onwards, and the diameter of the iris gradually divided: the lens thus being set at liberty, will instantly escape; if it does not, the point of the curette or cataract hook will accomplish it: if on this division the pupil does not gape open, a division of the iris should be made at right angles with the first, or a portion of it may be removed.

In executing this operation, perseverance is sometimes necessary, but I would recommend the operator never to hurry himself, nor to be satisfied until he has accomplished the object of the operation, namely, a full and open black pupil.

OF THE

OPERATION FOR THE CATARACT, WHEN THE LOWER HALF OF THE CORNEA IS OPAQUE.

In this case the section of the cornea should be made in the opaque semi-circumference of it, and the opaque lens being removed, the fibres of the iris should be divided with the scissars, at the part corresponding to the remaining transparent circumference of the cornea. If this division of the iris is not made, the field of the pupil will not be large enough to admit of useful vision.

If the opacity should be in the upper semi-circumference of the cornea, then the section of the cornea should be made there, and the division of the fibres of the iris should correspond to the lower transparent portion: but this division of the fibres of the iris should never be made when the opacity of the cornea does not encroach much on the field of the pupil; the opaqueness of the cornea will not prevent the healing of the wound.

ON THE

EXTRACTION OF THE CATARACT, WHEN THE VITREOUS HUMOUR IS DISSOLVED.

In operating on these cases, which may be known by their being generally attended with an undulating iris, the surgeon should scrupulously avoid the slightest pressure on the globe, even during the passage of the knife through the cornea, lest the capsule of the lens and vitreous humour should be ruptured.

When the section in the cornea is completed, in puncturing the capsule of the lens, he should take care that the point of the curette does not pass deep enough to wound the posterior capsule of the lens and vitreous humour, and thus occasion the humour to escape. Some oculists prefer depression of the lens when the humour is dissolved.

OF THE

IMPROPRIETY OF WAITING TILL THE CATARACT BECOMES WHAT IS TERMED COMPLETE.

THERE can hardly be a stronger instance of the effect of prejudice than the inconsistency of waiting till the lens is completely opaque in each eye, before an operation is recommended: this advice is frequently given by men who are considered eminent in their profession, and I have known it advocated even by hospital surgeons.

A part of the eye, naturally transparent, is becoming opaque; the opacity has commenced in its centre, and is proceeding gradually to its circumference; the body or nucleus of the lens is already diseased, then why wait till the circumference becomes diseased also: if the lens was in a better state for the operation, then this advice might be recommended; but the fact is otherwise, for the circumference of the lens is apt to become harder, and this will

not facilitate the operation of extraction. Again, when the lens in one eye becomes opaque several years before the other, the capsule of it is apt to contract adhesions to the iris, and thus render the operation doubtful. For my own part, I am convinced that the earlier a cataractous eye is operated on the better, and I will confirm this opinion by illustrating it with the relation of a case or two.

Case I.

In 1824, I was consulted by Mr. Wm. Timbrell of Cheltenham, who was blind with his right eye from cataract: he was anxious to have the operation performed the day he arrived: I therefore extracted the opaque lens, and he returned home at the expiration of a week, being able to read: in his left eye the disease had just commenced.

Case II.

In 1824, I extracted the opaque lenses for a poor woman. With one eye she had been blind twelve years, and in this the

operation did not succeed, but with the other she could see to read: this case points out the propriety of an early operation.

Case III.

In 1824, a poor man was admitted, from Mr. Morrel's recommendation, into the Radcliffe Infirmary, under my care for a cataract in one of his eyes; this I extracted, and he recovered his sight; in the other the disease had only commenced.

OF THE

EXTRACTION OF THE CATARACT, THROUGH A SECTION IN THE UPPER SEMI-CIRCUMFERENCE OF THE CORNEA.

In this case, the cutting edge of the cornea knife should be turned upwards, instead of downwards, but in other respects the operation does not differ from the section downwards and outwards; this operation is easy of execution, and one advantage arising from it is that the wound is entirely covered by the upper eye-lid; it has been thought advantageous, where the cataract is large, the vitreous humour dissolved, or, where the cataract floats about, resembling an hydatid.

OF THE FLUID OR MILKY CATARACT.

This may generally be distinguished, previous to an operation, by the parts possessing different shades of opacity, and changing their situation according to the position of the patient's head, or motion of the globe; likewise from this effect being produced by pressure with the finger on the cornea; the capsule of the lens is, in most of these cases, opaque, and therefore should be removed. The section of the cornea being made in the usual way, the instant the capsule is ruptured, the opaque fluid will flow out, and temporary obscure the iris, till it makes its escape at the wound in the cornea; if, on its evacuation, the pupil does not appear black and clear, the capsule should be removed in the manner I shall presently describe.

OF OPERATIONS ON THE OPAQUE CAPSULE OF THE LENS.

These may be divided into those which comprehend its complete removal, or so much of it as is sufficient for useful vision; and those which effect merely its rupture or laceration in the centre, without removal. It must be obvious that the first is a certain, the second a fortuitous or uncertain, operation, in regard to vision.

The extraction of the opaque capsule is effected by making a section of the cornea, as in the operation of extracting the lens, and then removing the capsule, either with a pair of delicate forceps, or with a fine cataract-hook: for this purpose the operator should be provided with several pairs of forceps, the points of which should be accurately adjusted, and the shape of them should vary, so that if one pair will not seize it, another may. Some degree of adroitness is necessary in extracting the capsule, as it is apt to snap or tear from the

hold of the forceps or hook. The operator, having seized it with one of these instruments, should, by a circular manœuvre of his wrist, endeavour to tear it from its base; he may also assist its separation by a sharp-pointed needle, but this should be used with caution: when it is combined with opacity of the lens, it is easier to remove it before the lens is extracted. As this is rather a difficult operation, I would recommend the young surgeon to acquire dexterity in performing it, by practising it frequently on the eye of the sheep.

The operation of rending or lacerating the capsule I have frequently performed in the following manner:—

A half section of the semicircumference of the cornea has been first made, and the capsule rent in the centre by Scarpa's curved needle introduced at the opening: this opening will also be found equal to its removal, which should be preferred. It may be lacerated by introducing a strong straight sharp-pointed needle through the cornea, about a line from its junction with the sclerotica, and then dipping its point

into the pupil, and freely destroying the centre of the capsule. The opaque capsule may also be lacerated, by performing what is termed the posterior operation, and which consists of introducing Scarpa's needle through the sclerotica, about a line from its junction with the cornea, bringing it forwards into the pupil, and freely lacerating the centre of the opaque capsule. All that can be said in favour of this method is, that the operator has greater power with the needle from its position in the eye; but this is more than counterbalanced by the uncertainty of the operation, and by its being attended with much more inflammation than either of the anterior operations.

OF THE

OPERATION FOR CONGENITAL CATARACT.

It is evident that Cheselden occasionally operated on children born blind, but we are certainly indebted to Mr. Saunders for bringing the operation into general notice. The capsule, as well as the lens itself, is generally opaque in these cases, and therefore the object of the operator should be to make a central opening in the former membrane. For this purpose Mr. Saunders devised two operations, which he distinguished by the situation at which the instrument entered the eye; thus, one he nominated the anterior, from the instrument entering the cornea before the sclerotica, and the other the posterior, from its entering the sclerotica behind the cornea. Mr. Pott was evidently acquainted with the solvent properties of the aqueous humour, and it is on this that the principle of Mr. Saunders's

operation is founded. The efficacy of belladonna in dilating the pupil of the eye, although known before the time of Mr. Saunders, had never been applied as a co-adjutant in performing surgical operations on the organ, and therefore the credit of novelty and invention is due to him. The pupil of the eye to be operated on being first dilated by the application of the extract of belladonna to the eyebrow, an hour or two before the operation*, or diluted and applied between the eyelids, the point of a fine needle should be introduced (in the anterior operation) through the cornea, about a line from its union with the sclerotica, and having penetrated the anterior chamber, its point should be carried on a parallel plane with the iris, till it reaches the centre of the pupil: the operator should then work with its point on the capsule of the lens, till so much of it is destroyed, in its centre, as will correspond to the size of

* In order to prevent inconvenience, I generally direct the belladonna to be applied the night previous to, or the morning of an operation; the only treatment required before the operation is a brisk purgative.

the natural pupil: this being effected, he should gently sink his needle into the body of the lens, in order more readily to subject it to the solvent power of the aqueous humour, but he should cautiously avoid dislocating it, either by removing too much of the base of the capsule, or by using the body of the lens too roughly: the needle should then be withdrawn, and the lens left to the action of the absorbents, and the solvent power of the aqueous humour. If the first operation does not succeed, which it rarely does, it may be repeated at the expiration of a month or six weeks, and then the operator may make more freely both with the capsule and the lens; or he may, if he pleases, prefer the posterior operation which I am about to describe; but before I do this, I shall make a few remarks on the anterior operation.

The needle employed by Mr. Saunders is too slender to make an useful impression on the capsule of the lens, which is extremely tough; the consequence is, that it has been found necessary to repeat the operation six, eight, or even ten times, before the object

of it has been accomplished. I therefore prefer a needle stronger and sharper at its point. Again, Mr. Saunders studiously avoided removing the lens from its situation. All that I have to observe on this point is, that the lens in infants is so extremely soft, that I never experienced any inflammation or inconvenience from particles of it being projected into the anterior chamber for solution, but I always scrupulously avoid rupturing the capsule of the vitreous humour. Unless a large permanent central opening is effected in the capsule, it is impossible that one operation can succeed; but I think this may generally be done by using the instrument I have recommended.

In the posterior operation, the pupil should be dilated by belladonna, as previously described: the point of the straight needle should then be introduced through the sclerotica, about two lines from its junction with the cornea, and a little below the centre of the globe; it should then be brought forward into the centre of the pupil, and in this situation the operator should endeavour to effect a large, permanent, cen-

tral opening in the opaque capsule of the lens: small portions of the lens should be occasionally thrown into the anterior chamber, for the purpose of solution.

The operator certainly possesses greater power over the opaque capsule and the lens in the posterior operation, but he must take care not to abuse this power, since the structures of the eye, which are involved and injured in this operation, are more prone to inflame, and when once inflamed, the consequences are extremely injurious to vision. Let him avoid keeping the instrument too long in the eye, and stirring up the organ, if I may be allowed this expression, too violently, for if he does not, the inflammation will run so high as to occasion obliterated pupil, and thus disappoint his present hopes, and deprive him of the opportunity of repeating this operation at any future period: let him rather at first be satisfied with freely rupturing the centre of the capsule by a few gentle evolutions of the point of the needle, and projecting a few scales of the lens into the anterior chamber for solution. By adopting

this mode I have frequently succeeded at one operation, and without the risk of a destructive inflammation.

The needle which I prefer is a strong curved one, in length about the diameter of the globe, convex on one side, and flat on the other; its blade is very narrow, but the convexity gives it strength: this double-edged needle enters the eye with the greatest facility, and is introduced with its convex face forwards. I also frequently make use of Scarpa's needle with great success in this operation, but made with a more acute point than usual.

OF THE

MANAGEMENT OF SMALL FRÆNA, OR BRIDLES OF CAPSULE, INTERSECTING THE PUPIL.

It occasionally happens, when an operation or two has been performed on the same eye, that a small bridle of the capsule has remained intersecting the pupil, both extremities of which adhered to the edge of the iris: this bridle of capsule is now and then so strong that I have seen the needle, entangled in it for its rupture, absolutely bring the edges of the pupil in contact; in this case care should be taken not to use such violence as to detach it from the ligamentum ciliare. The operator should, in these cases, perform the posterior operation, because it would give him the greatest power; and, by executing a variety of manœuvres, should cautiously endeavour to divide it in its centre. I have frequently succeeded by twirling the handle

of the needle between my fingers, and have thus entangled it in the point, and shortened its attachments, till it snapped; at other times I have pierced it with the point of the needle, and snapped it in the centre: a curved needle is best for this operation.

The earlier an operation is performed, in cases of congenital cataract, the better. First, because the younger the infant, the more manageable. Secondly, the organ will probably be more perfect as an optical instrument. Thirdly, the infant will possess greater command over the voluntary muscles of the eye, and thus be enabled to fix the globe more steadily on an object. Fourthly, it will be a better judge of distance and the perception of objects, and will have an earlier knowledge of their nature *; for if a man born blind recovers his sight, his perception only of objects will not at first enable him to distinguish them; he knows them only by touch, and has to learn them by perception, which will occupy him

* Infants, after this operation, should be early taught to exercise their vision, by placing a variety of objects before them.

a considerable time *. Fifthly, and perhaps as important as any, the education of the child will not be impeded. Sixthly, the longer the operation is deferred, the thicker and tougher the capsule becomes; for the lens is generally nearly or entirely absorbed, (though I shall presently relate a case to the contrary,) and the anterior layer of the capsule recedes on the posterior.

The capsule of the lens, in these cases, is generally opaque; and as it is obvious that the principal object is to effect a permanent central opening in it, the thinner it is, the less difficult will be the operation, and vice versâ.

Mary Ryeman, ætat. 14, or thereabout, who died from diseased brain, and the dissection of whose case I have previously given, was born with cataracts. I saw her eight years before she died, and her parents declined having an operation performed on her: I removed her eyes after death, and

* I have seen this circumstance exemplified in a gentleman, on whom the operation had been performed so late in life, that the advantages arising from it were comparatively trifling.

found, on examination, the capsule of each lens tough and opaque, and the lenses entire.

As it is not often that we can obtain the eyes of children born blind, I made preparations of them.

CASES OF INFANTS BORN BLIND WHOSE SIGHT WERE RECOVERED.

Case I.

In April, 1815, I operated on the infant of Mrs. Kirby, of Fritwell, near Somerton: the infant was twenty-one weeks old when I performed the operation, and the cataracts were soft, with opaque capsules. The pupils being dilated by the application of belladonna the night previous, I introduced a fine strong needle through the cornea, about a line from its junction with the sclerotica, into the anterior chamber, and passed it on a parallel plane with the iris till its point reached the centre of the pupil; I now dipped its point into the centre of the capsule, and worked at it till there was a large central opening in it; I then sunk it gently into the substance of the lens, and sliced off a portion or two, which I projected into the anterior chamber for solu-

tion. The other eye was operated on in the same way, but I did not make so free with the lens; the infant was in a state to return home in a week. At the expiration of three months I again saw the child, and it could see well with the eye in which the lens was made free with, but a small portion of capsule remained in the pupil of the other, which I now took an opportunity of dividing, and in another week the infant returned, and could see well with both eyes: the after-treatment of these cases should be the same as in extraction or depression of the lens.

Case II.

In 1817, I operated on a young man of the name of Stephens, about twenty years of age, who was then living at Witney: he had a congenital cataract in each eye; and had undergone an operation in London, which, not succeeding, he returned disappointed. In this case I performed the posterior operation on each eye, which succeeded, and the man was extremely thankful for what I had done for him.

Case III.

An infant, three months old, was brought to me from Sparsholt, for my opinion: the disease proved to be congenital cataract*. A few days after, I performed the posterior operation by introducing my curved needle through the sclerotica about two lines from its junction with the cornea, and bringing its point into the anterior chamber, worked gently on the capsule of the lens till I had effected a large central opening in it, and lastly projected a few of the fragments of the lens into the anterior chamber for solution; both eyes were operated on in the same way; no inflammation followed the operations, and in a fortnight the infant and its parents returned home. I saw it again a few months afterwards; the pupil of each eye was very clear, and the operation had completely succeeded.

Case IV.

This child, whose name I almost forget,

* The child's name was Mary Woolridge.

came from the same place as the preceding one, but I believe he was a year or two old. The posterior operation was performed in the same manner: it was followed by some degree of inflammation, but not of a violent nature, and the child returned home in a month. I have since seen him, and his sight is very good.

Cases V and VI.

These cases consist of two infants born blind, and from the same parents.

Elizabeth Snow, the second child of a poor woman living at Headington, near this city, was brought for my opinion on its eyes. The infant had a congenital cataract in each eye, or more properly speaking, both lenses were opaque. I performed the posterior operation on both eyes, at five months old; and on one eye I had occasion to repeat the operation. The child at three years old can see to pick up a pin, and larger objects distinctly, at several yards' distance.

Ann Snow, the third child, was born

about three years afterwards, and in this infant also the lenses were opaque. On this I performed the posterior operation at two months old in my usual manner, with my right and left hand: the operations succeeded, and did not require a repetition.

Numerous cases are on record of all the children from the same parents being born blind from this disease.

Case VII.

This child* was brought to me out of Huntingdonshire, having congenital cataracts. The lenses were extremely white, and it was the opinion of those medical men who had seen it, that it could not be operated on till it was older. I performed the operation upon it a few days after its arrival. In this case I introduced Scarpa's needle through the sclerotica, two lines behind the cornea, and a little below the centre of the globe: on bringing its point towards the anterior chamber, in order to freely lacerate the centre of the capsule, I

* Mary Lord, nine months old.

found the opaque lens very bulky, I therefore made a large central opening in the capsule, and projected some of the fragments of the lens into the anterior chamber. The left eye I operated on in the same manner with my left hand. The infant returned home in eight days.

I did not see it for nearly nine months afterwards, when the pupils were extremely clear, and the mother informed me the child could see very well.

Case VIII.

——— Taylor, a boy three years old, whose father was afflicted with cataracts, which I extracted the same day, was born blind from the same disease.

I performed the posterior operation upon him with Scarpa's needle. One eye was considerably inflamed for a day or two after the operation, and this I entirely attributed to using the needle rather freely; the other was not at all inflamed. The father and son returned home in a fortnight.

The child, some months since the opera-

tion, could distinguish minute objects: the father recovered his sight previous to his leaving Oxford.

It would weary the reader to relate more cases of this description, particularly as they are very similar.

This operation on infants may be performed either with or without a speculum; I would have the operator accustom himself to perform all operations on the eye without a speculum, as this will give him great dexterity and adroitness: if a speculum is used, Pellier's is the best; which is to be held with the operator's left hand, if the right eye is to be operated on, and with his right, if the left is the subject of the operation. The mode of fixing the infant is as follows:—It is to be laid on a table with a pillow under its head, the hand of an assistant should prevent the motion of the head upon the breast by receiving it under the angle of the jaw between his thumb and fore finger, whilst another assistant fixes the vertex of the head with his hands crossing each other. The operator should be seated on a chair behind, which

position will enable him to operate on each eye (supposing him to be ambidexter) without altering the position of the patient. The eye not the subject of the operation should be covered during its performance, and this applies both to extraction and depression.

OF

OPERATIONS TO BE PERFORMED AFTER ATTACKS OF INFLAMMATION WHICH HAVE DESTROYED THE SIGHT, AND OF CONSECUTIVE OPERATIONS.

Choroiditis and Iritis, primary, secondary, and syphilitic, as well as the different kinds of acute ophthalmy, will frequently, by producing obliterated pupil, occasion loss of sight. The time the organ requires for recovering from over-excitement, varies in different constitutions: accordingly it is impossible to state the exact periods at which operations should be performed, with every prospect of success. But take it as a general rule, no operation should be undertaken till the organ has become perfectly quiet, that is, till every symptom or vestige of continuing excitement has ceased, and there is not the least disposition to disease in the organ. Hence it would be highly

imprudent to perform an operation for artificial pupil on an eye lately recovered from an attack of inflammation which has rendered the operation necessary; as the introduction of an instrument into the eye under such circumstances, would reproduce excitement in those very vessels which were but recently the subject of it, and thus the object of the operation would be defeated: whereas by waiting a year or two, more or less, as the case demands, that is, till the organ has become perfectly quiet, the object of the operation, namely, the recovery of the patient's sight, would be with more certainty ensured. These observations apply also to consecutive operations, by which I mean operations undertaken after previous operations have failed: for example, when an attempt has been made to depress a cataract, and a great degree of inflammation has followed it, so that eventually it has terminated in obliterated pupil; the operation for an artificial one should not be performed for two or three years afterwards. But the time should vary according to the effects of the operation: thus, if the opera-

tion of depression should be performed and merely fail, without being followed by inflammation which has affected the pupil, the operation of extraction may be undertaken earlier without any danger.

I lately extracted a cataract from an eye on which two attempts had been made to depress it, three months after the last operation, with perfect success, and without its being followed by the least inflammation.

The same observations should extend to failures in the operation of extraction; thus, should the capsule of the lens become opaque, it may generally be removed at an early period, since the inflammation which follows the anterior operations is seldom so violent as the posterior.

OF THE

OPERATION OF FORMING AN ARTIFICIAL PUPIL.

I HAVE already noticed that Cheselden invented this operation, and that it has been revived by several modern surgeons. It consisted in introducing a thin knife with a cutting edge on one side, through the sclerotica, about a line from its union with the cornea, and passing its point through the fibres of the iris, near its junction with the cornea, into the anterior chamber, and then dividing the fibres throughout its diameter. When the disease was combined with cataract, he directed the incision through the iris to be made above the situation of the natural pupil. This operation was generally unsuccessful, and this opinion is supported by Sharp, whose words are, "This operation, by what I have seen, has answered best in adhesions of the crystalline humour, but, to speak truly, very

seldom even there. As I would not mislead any one who shall practise an operation not yet much known in the world, I do confess that either the danger of the iris separating from the ligamentum ciliare, or of the wound not enlarging sufficiently, do upon the whole make the event very doubtful. I once performed it with tolerable success, and a few months after, the very orifice I had made contracted, and brought on blindness again."

I shall now shew why it is an unsuccessful operation. First, because it is difficult to execute, and of this I have treated in another place. Secondly, the inflammation occasioned by it is generally so violent as to destroy, by the effusion of coagulable lymph, the newly-formed pupil, or to produce adhesion of the divided fibres. Thirdly, it leaves the opaque lens behind, provided it has not been removed by a previous operation.

The structure of the organ supports the opinion, that all the posterior operations will be necessarily attended with more inflammation than the anterior, and this is

particularly exemplified in the posterior operation for artificial pupil. The agony that most of the patients endure, who have undergone this operation, exceeds description: the inflammation is so violent, that they cannot rest night or day; the lancet is in constant requisition to give them temporary relief, and even this at last fails; but I have spoken of this so fully in another place that I shall not here repeat it.

I grant that the operation now and then succeeds, and I have related instances of its success, but it is more frequently otherwise: it is not so certain as the following, which I prefer.

The cornea knife should be introduced as in the operation of extraction, and a section equally large should be effected; the point of Maunoir's scissors should then be introduced through the fibres of the iris, nearly close to its junction with the cornea, and the fibres of the membrane divided throughout its diameter: the lens will then escape, and leave a full, fair, and open pupil, provided the capsule is not opaque, which if it is, should be removed. If on perform-

ing a perpendicular or transverse division, the fibres of the iris should not contract, so as to form a clear and open pupil, another incision at right angles with the first should be made, or a portion of the iris, in figure like the letter V inverted, should be removed: this operation never disappointed me. Maunoir thinks it practicable to divide the fibres of the iris, when the lens and its capsule remain transparent, without disturbing these parts; but this I have never found so, as the lens generally escapes during the division of the iris.

It will be manifest, if Cheselden's operation should be performed, that the opaque lens would remain to be absorbed, which in elderly people, as I have already observed, would seldom happen, whilst in the latter operation it would be effectually removed.

Contrast the two operations, and the superiority of one over the other will be evident. In Cheselden's, the division of the fibres of the iris will be more difficult: the inflammation will frequently run so

high as to defeat the operation; and the opaque lens will remain behind, requiring some months for its absorption, and in elderly people it will be seldom absorbed: lastly, this operation more frequently fails than otherwise.

In Maunoir's operation, the division of the fibres of the iris will be easily executed, and to any extent the operator wishes: the opaque lens or its capsule may be with absolute certainty removed, and the inflammation attending it will not be near so violent: the patient will recover his sight in a much shorter period. Let me again caution the surgeon against hurry in this operation: if he should find, that his first incision with the scissors has not made a sufficient opening, let him wait a minute, softly wipe away any effused fluid, and enlarge the opening by their re-application, till he has completely effected the object of the operation.

In making the section in the cornea, the operator may if he pleases dip the point of the cornea knife through the iris, and hav-

ing formed the pupil, bring its point out on the opposite side of the cornea.

When a portion of the cornea is opaque, I invariably prefer making this portion the seat of the incision, and I have always found it heal favourably: by doing this, I secure for the artificial pupil the whole of the transparent portion. It may be imagined that an old opaque cornea will not readily heal, its organization having been changed; but experience shows this not to be the case: thus, when a portion of the cornea has been disorganized by lime, it has readily healed after being the subject of an operation.

Another mode of forming an artificial pupil, is by making a section in the cornea, sufficient to allow the iris to prolapse, or if it does not, gently to draw it out at the wound with a hook, and then cut away the included portion of the membrane: this I believe is Mr. Gibson's operation, and is advantageous in some cases.

An artificial pupil may also be made in the following manner: when the point of the cornea knife has penetrated the cornea,

let it be passed on through the iris, about a line from its ciliary attachment; then let it cross the diameter of the pupil, and penetrate the opposite side of the cornea, as in the operation of extraction; the flap of the iris is then to be removed with the scissors: the aperture in the iris or the newly-formed pupil will be nearly as large as the section in the cornea, and it will represent a crescent: the lens and its capsule should be treated as previously described.

I have lately formed an artificial pupil on infants with great success in the following manner. I have introduced a delicate bistoury, having a back as thin as the cornea knife, through the cornea and iris, a line or two from their circumference; I have then directed the blade across its diameter, so as to divide the iris from side to side: this opening has allowed the lens to escape, and has occasioned a good and useful pupil *. I have never known this operation followed by violent inflammation, and on children I prefer it to Cheselden's on

* The knife is so extremely fine, that the cicatrix is scarcely perceptible.

this account: there are, however, cases in which his operation is the only one admissible.

There are now and then cases where Scarpa's operation of detaching the iris from the ligamentum ciliare, and thus forming an artificial pupil, may be serviceable, but I have not a very high opinion of it: if a small portion of the sclerotic circumference only of the cornea remains transparent, the detachment of the iris from the ligamentum ciliare might be beneficial, but the iris is apt to recover its situation, and for this reason I seldom perform it.

The immediate effect of a division of the iris, will be effusion of blood into the anterior chamber, but this is of no consequence, since it will become rapidly absorbed, and the inflammation that follows a simple division of it, unconnected with the other structures of the eye, will be comparatively trifling. The treatment and dressings after these operations should be the same as after extraction.

The circumstance most to be apprehended after all operations for artificial

pupil, is the effusion of coagulable lymph from inflammation, and for this mercury is the best remedy, but it should be resorted to the instant inflammation commences, otherwise the lymph will be organized, and then it will be useless.

OF

THE OPERATION OF COUCHING.

I HAD almost purposely omitted to describe the common operation of couching, because I disapprove of it, but I shall describe it, in order to offer a few remarks, to prevent those evils which are apt to result from an injudicious mode of performing it.

Scarpa's is the best needle for executing this operation, but its concave face should be made rather flatter and broader than usual. The operator should bear in mind that all instruments when introduced into the eye for this purpose should be used as levers.

The point of the needle, having its concave face turned backwards, should be introduced through the sclerotica about two lines from its junction with the cornea, and a little below the centre of the globe, in order to avoid the long ciliary artery; it should then be carried forward in the direc-

tion of the superior margin of the pupil; as soon as it is observed emerging from behind the iris, its concave face should be turned downwards: if these movements should be properly executed, the needle will now be resting on the edge of the lens, between it and the iris: the handle of the instrument should then be elevated by a movement of the wrist, which will depress its point, and thus sink the lens into the body of the vitreous humour: the point of the needle should then be cautiously elevated, when, if the lens remains depressed, it should be removed from the eye in the same manner in which it entered: should the lens accompany the elevation of the needle, it should be again gently depressed till it remains below the border of the pupil. The operator should avoid striking his needle into the body of the lens, as in this case he would have more difficulty in depressing the lens, or disengaging his instrument. Should the lens be soft, he will not be able to depress it, and therefore he should withdraw his needle with the intention of extracting it at some future period;

for if he should persist in his endeavours to depress it, the violence done to the capsule would occasion opacity of it, and thus render the subsequent operation of extraction more complicated.

Case I.

A gentleman attempted to depress a soft opaque lens for an elderly lady, and used his needle very freely; the operation failed, and the capsule became opaque: I subsequently extracted both the lens and its capsule, and she recovered her sight.

Should the needle be used very freely, the inflammation may run so high as to occasion obliterated pupil.

Case II.

An elderly gentleman underwent the operation of depression in the country on both his eyes: the operations failed; in one eye the inflammation that succeeded obliterated the pupil, and the months of agony that this poor man endured exceeded

description *; this eye was irrecoverably lost; from the other I extracted the lens a year afterwards, and he recovered his sight.

These two cases point out the propriety of using instruments in this operation very delicately.

There is another species of depression which has been termed reclination, from the flat surface of the lens being depressed horizontally into the substance of the vitreous humour.

In order to effect this, when the needle has penetrated the sclerotica, its point should be directed to the temporal margin of the pupil, it should then be carried across the pupil to the opposite edge of the lens; the handle of the instrument should then be directed forwards, which will give its point an inclination backwards, and carry with it the lens, which should then, by a slight circulatory motion of the wrist,

* The best remedy in such cases is depletion, with mercury given to such extent as slightly to affect the system.

be depressed horizontally into the substance of the vitreous humour.

The operation has no advantage over the one previously described, and it certainly disturbs the vitreous humour more *. A frequent repetition of couching is apt to injure the structures of the organ, and to unfit it for consecutive operations.

The needle operation may be performed with advantage, when combined with cataract, the field of the pupil has been diminished by inflammation, from adhesions of the iris to the opaque capsule, which is frequently the effect of gout and iritis.

The pupil should first be dilated with belladonna to its greatest extent, which will enable the operator to remark the points of adhesion; the lens should next be cautiously depressed, and then a central opening effected in the opaque capsule. As these opacities are the product of inflammation, the needle cannot be used too delicately, and I would recommend the operator, should he not be able to effect his purpose

* Depression has been performed through the cornea, but there is no advantage in this.

without making too free with the globe, to prefer repeating his operation at a future period.

After these operations the Pil. Hydrarg. should be given every night, and if the mouth should be slightly affected so much the better: if the patient be of a gouty habit, the Vin. Colchici may be given with advantage.

Should the capsule become opaque after extraction or depression of the opaque lens, then also the needle may be advantageously used.

When the vitreous humour is dissolved, which is often the effect of repeated and long-continued inflammation in the interior of the organ, then the needle should be resorted to: (the iris is often tremulous in these cases,) such a state of the organ is extremely unfavourable for any operation, but as every oculist will be occasionally called upon to operate on doubtful cases, I would recommend him to state the case candidly and honestly to his patient, and then whatever may be the result he will have acquitted himself with honour: the

operation, performed with delicacy, is not a painful one, and therefore, whenever there is a possibility of success, I think it should be performed. You cannot make the matter worse, and you certainly gain a considerable point, if a few out of these doubtful cases succeed; and I have known several.

It has been thought prudent to prefer the needle when the iris is very convex, and the anterior chamber very narrow, but I have frequently extracted the lens successfully in these cases, and without injuring the iris: the pupil should first be dilated with belladonna, which will remove the iris from the edge of the knife, and enable the operator to direct his instrument with greater precision.

I will anticipate the advocates for depression, by observing, that I could enumerate abundant instances of its efficacy, (but applied generally, the number of failures considerably more than counterbalance the successful cases,) and I by no means wish to condemn it altogether, since in certain cases it has its advantages, but let

me again beg of those who adopt it to use the needle with the greatest delicacy. No one operation is adapted to all cases, and that surgeon will succeed best, whose judgment and experience enables him to discriminate which is the most proper: as a general rule, there will and have been, the most eminent who have given the preference to extraction, and this is the best argument that can be adduced on the subject in its favour; but it certainly requires more judgment than any operation in surgery, but like every thing else, when once acquired, the difficulty ceases.

OF THE DEFECTIVE SIGHT OF LITERARY CHARACTERS.

THE effect of intense application, or exercise of any organ, is a greater determina- of blood to it. During digestion, the exercise of the intellectual faculties, and the secretion of bile, a greater quantity of blood is sent to the respective organs, in order to enable them to perform their different functions with due vigour.

If this excess of action was continued without intermission, that is, if the organic structures enjoyed no repose, disease would be the consequence.

This is exemplified in the defective sight of literary characters and compositors, which is occasioned, as I shall subsequently show, by over-excitement of the vessels of the organ, produced by intense exercise of them; so that what was at first occasional or temporary, eventually becomes permanent or habitual. But all literary charac-

ters are not near-sighted, which merely implies that there is a state of the organ predisposing to it.

During intense and long-continued reading, particularly if the print should be small, or in the deciphering of old parliamentary or other manuscripts, which have been rendered almost illegible by time, a greater quantity of blood is injected, through the medium of the ophthalmic artery, to the choroid and other coats of the eye, so that the organ may be said to endure a constant straining. The effect of this constant determination of blood to the organ, will be an increase of secretion in some, and perhaps in most of the humours of the eye, for the organ perceptibly becomes more globular, and the cornea more prominent or convex, indicating that the aqueous or vitreous humour is increased in quantity.

The effect of this will be to cause the rays from the object to converge to a focus too soon, so that the focal distance will be shortened and fall in the vitreous humour

before the retina; and this fully accounts for the near and short-sighted vision to which these individuals are subject.

This inconvenience should be remedied, by placing a concave glass before the eye, which by causing the rays to diverge between the object and the eye, will lengthen the focal distance, so that the rays will unite at the retina, and form a correct image upon it.

When this optical defect is the consequence of over-exercise of the organ, the patient should abstain from the exciting cause. As the eyes of individuals afflicted with this defect are frequently painful, irritable, and vascular, the bowels should be kept regular, and blood should be occasionally taken from the temples or region of the eye-lids by leeches, cupping, &c., and when the symptoms are very severe, a little blood may be drawn from the arm with advantage.

It is very common for myopic vision to be constitutional or hereditary. We frequently meet with families, where from one of the parents being near-sighted, the whole

or one-half of the children have been born myopic: this is occasioned by too great convexity of the lens, and as the lens generally decreases in convexity as we advance in years, this defect will in some measure remedy itself, but this will not always be the case.

In elderly people, the crystalline lens is generally decreased in convexity, so that the focal distance is lengthened, and vision rendered indistinct. In this case, those rays which flow from the object, and pass through the humours of the eye, do not converge soon enough, and fall behind the retina. This should be remedied by using a convex lens, which will occasion the rays to converge earlier, and thus imprint the image correctly on the retina.

Those individuals who have the humours of the proper degree of convexity, cannot see any object distinctly at a less distance than six inches.

Every oculist should be provided with a set of adaptation glasses, concave and convex, for correcting optical defects in the organ: they should also be provided

with coloured glasses, which are serviceable in morbid sensibilities of the retina. Dr. Brewster, in his experiments on light, observes, that glasses of a yellowish green colour are to be preferred.

OF THE

TREATMENT OF THE GLOBE, WHEN IT HAS SUPPURATED, AND THE SIGHT IS DESTROYED.

When the globe has suppurated, and the choroid and iris are involved in the inflammation, so that it is utterly impracticable to preserve the patient's sight, it is needless to prolong his sufferings. The tightness, toughness, and elasticity of the external tunic of the eye prevents the matter from readily approaching the surface, so as to burst and gain egress. The pain that the patient endures during the confinement of this matter is so great that it exceeds description; night after night passes without a moment's rest; he is almost distracted with the pain in his head and temples, which in some instances is so severe as to produce delirium. But all these urgent symptoms may be immediately relieved by evacuating the whole contents of

the globe; which will be best effected by introducing a cornea knife through the sclerotica, as far back as possible, at least, considerably behind the cornea, and bringing its point out on the opposite side, so that a large and free opening may be made, at which the whole contents of the globe, with a very little assistance, will readily escape. If the operator from fear, or a futile attempt to save the eye, merely punctures the cornea, the object of his operation will not be effected, and his patient will be disappointed, for he will reap no relief. Another mode of effecting this object, is by plunging a sharp pointed bistoury through the sclerotica, and bringing its point out on the opposite side, and then dividing the interspace. The globe should then be fomented with warm water several times in the day, as it will seldom bear a poultice: it should be dressed as simply as possible, kept clean, and the bowels regulated.

I have frequently known instances of individuals who have not enjoyed any rest for weeks, go home and sleep soundly the

first night after the operation; so instant is the relief afforded.

The eye will not invariably sink after this operation, as the aqueous humour will still be secreted, and the vitreous will to a certain extent be regenerated. A year or two afterwards an artificial eye may be adopted.

OF FUNGUS HÆMATODES OF THE EYE.

The appearance of this disease will depend on the structure of the part it commences in; should it commence in the cornea or sclerotica, it will represent a fungus of an intractable nature, which will gradually involve the surrounding structures; no application has any influence over it, and as it advances, there is frequently hemorrhage, which can only be stopped by pressure. Should it commence in the choroid coat, or in the centre of the globe, the pupil will become inordinately dilated, and the capsule and body of the lens will represent a beautiful pinkish or reddish blush: the eyes will express a hideous stare, and will appear to bear more than usual proportion to the size of the body; at length the cornea will give way, when the disease will proceed in the manner previously described. It does not always attack both eyes, and is generally connected with a similar diseased state of the brain.

Children are more subject to it than adults: the removal of the globe answers no purpose, for whether removed or not it is always fatal.

Four instances have lately fallen under my notice, all of which were connected with a disease of the brain, and terminated fatally. One of them was mistaken by a practitioner in the country for cataract, and narrowly escaped being operated on as such.

The diseased globe on examination represents a disorganized mass, having the appearance of blood and brain; its structures are no longer cognizable.

OF THE REMOVAL OF THE GLOBE OF THE EYE.

When from cancer, or any other malignant disease of the globe or its appendages, it should be thought prudent to remove the eye, it should be effected in the following manner.

The conjunctiva should first be divided with a thin sharp-pointed knife, and next all the muscles inserted into the globe: this being done, the point of the knife should be carried cautiously backwards to the posterior part of the orbit, and the optic nerve divided: the nerve will be more easily divided, by directing the knife backwards into the orbit on the nasal side of the globe, as the optic foramen is situated nearer on this side from the centre of the orbit. The operator should be careful not to injure the thin orbitar plate of the frontal bone, otherwise the brain may be injured, and in dividing the nerve, he should avoid stretching it. When the diseased globe

is prodigiously large, some authors recommend dividing the integument at the external commissure of the eye-lid; but in this case I should prefer letting out the contents of the globe: the operation may be assisted by introducing a double hook into the cornea, and drawing the eye gently forwards as the parts are divided. Very little hæmorrhage succeeds this operation, unless the vessels are diseased, when it may be restrained by pressure: the dressings should be as simple as possible.

OF ARTIFICIAL EYES.

Of these I will merely observe, that they are now brought to such perfection that they are not readily to be distinguished from the natural eye: the best are made of enamel, and the French particularly excel in manufacturing them: they are used when the organ has been destroyed by suppuration or by accident, but should never be employed till all inflammation and tenderness has subsided. The more that remains of the natural eye the better will be the deception, since the muscles of the natural globe will communicate their motions to the artificial eye: in the event of accidental inflammation in the orbit, the individual should remove it till this has subsided.

Persons should be provided with more than one artificial eye in case of an accident: it should be removed every night and cleaned, and the orbit should be

washed with warm or cold water night and morning.

I placed one in for a young man who was waiter at an inn; the deception was so good that his friends hardly knew him, and several absolutely mistook the sound eye for the artificial one.

OF SOME OF THE DISEASES OF THE LACRYMAL APPENDAGES.

WANT of time and leisure will not permit me to describe the anatomy of these parts, or to enter into their diseases so fully as I could wish; I shall, therefore, merely point out those measures which from experience I have found beneficial.

OF

FISTULA LACRYMALIS, OR STRICTURE IN THE NASAL DUCT.

This is simply nothing more than a stricture or obstruction in a mucous canal, analogous to stricture in the urethra, and the treatment should be the same in both, namely, to overcome the obstruction, and render the canal permanent. Its existence may be known by the mucus, or matter collecting in the lacrymal sac, distending it, and on pressure at the internal angle of the eye passing back again through the canaliculà, and discharging itself from the puncta over the globe; and from the tears dripping over the cheek, instead of pursuing their natural channel down into the nose. The obstruction may exist in the canaliculæ, in the sac, or in that part of the duct which is termed the nasal canal, or the puncta themselves may be impervious. The treatment should of course vary according

to the situation of the obstruction: thus it would be useless to perform the common operation of opening the sac, and introducing a style into the nose when the obstruction was in the canaliculæ: but this may be easily distinguished, for the tears and mucus would not enter the sac, and the same would apply to the puncta being impervious.

I have now and then found the introduction of a probe (fixed in a handle,) through one of the puncta, and passed down into the nose, beneficial in removing recent obstructions; but I never saw the least benefit derived from injecting the canal with Anel's syringe, or from any other mode of injecting the duct; indeed it would be as rational to expect to overcome strictures in the urethra with injections.

When I find the obstruction confirmed, and situated in the sac or nasal canal, I invariably proceed to the operation of removing it, which I generally effect by means of a probe and lancet: the integument covering the sac should never be permitted to ulcerate, but opened, and the operation if

necessary immediately or subsequently performed.

Another instrument that I make use of for performing this operation, and which I find extremely convenient, consists of a small trocar made of the same length as the style to be introduced, but one degree larger in circumference; like the style it has a head, and its point is set-out, as in the modern trocars, which occasions it to pass and repass the more readily. The integument and sac being divided with a sharp pointed bistoury or knife, below the tendon of the orbicularis muscle, this instrument, when introduced, will glide with the smallest force imaginable along the course of the nasal canal into the nose: it should then be immediately withdrawn, and the style instantly introduced: the operation in this manner rarely exceeds a few seconds.

I was induced to suggest this instrument from observing an operator very much foiled in performing this operation: he had opened the sac, and had penetrated with a sharp-pointed instrument the os unguis, but on attempting to follow it with the

style, he could not find the opening that he had made, and after searching for it nearly a quarter of an hour he was absolutely compelled to make a fresh one, before he could finish the operation.

The eye should be fomented with warm water several times during the day, and the bowels kept regular with a saline purgative.

In the course of a few days the style should be gently moved, and after the first fortnight it should be occasionally removed, cleaned, and replaced: after the patient has worn it constantly for six months, I generally entirely remove it; teach him to pass a common probe along the nasal canal into the nose, which I direct him to do every morning: this is invariably preferred, being more comfortable, and productive of less pain, uneasiness, and inflammation than the constant wearing of a style. After pursuing this plan for six months longer, the canal generally becomes permanent, and seldom requires any further surgical assistance.

Sometimes I prefer introducing a golden tube; and then an instrument I have found

extremely serviceable, is a very fine trocar, to which is adapted a delicate tube of the same length and circumference as the common style, and the top of which terminates in a small cavity not larger than the head of a style; just above this cavity or head, the shaft of the stilette increases in circumference, so that the tube cannot slip upwards in its introduction into the nasal canal; the shaft and handle of the stilette are considerably longer than the tube, in order to facilitate its introduction. On the opening being made into the sac, the trocar and tube should be passed along the course of the nasal canal into the nose; the edge of the nail of the operator should then be pressed against the head of the tube, and the stilette should be withdrawn, leaving the tube in the canal.

The mucous membrane of the canaliculæ and nasal canal is subject to inflammation, in which case the mucus becomes increased in quantity and altered in quality, and a temporary obstruction to the tears is occasioned by the swelling or villousness of the membrane. This should be treated as com-

mon inflammation, by soothing and sedative topical applications and saline aperients.

An inordinate accumulation of fluid, partly limpid, partly purulent, sometimes collects in the lacrymal sac, distending it to a prodigious size: this has been denominated dropsy of the lacrymal sac. The fluid will neither pass downwards nor backwards: in this case an obstruction exists both at the sacular extremities of the canaliculæ and the nasal canal, and the fluid collected is the natural secretion from the sac, become morbid from confinement. The treatment should consist of opening it, and re-establishing the canal.

The puncta lacrymalia occasionally become dilated and pulpy, and may be restored to their natural state by a solution of nitrate of silver, or sulphate of copper, or other astringent application, applied with a camel-hair pencil twice a day. In wounds of the cartilages of the lids situated near the puncta, and in the neighbourhood of the canaliculæ, particular attention should be paid to prevent their obstruction. The membrane of the lacrymal canal being

a mucous membrane, is, in addition, subject to all those diseases peculiar to such structures.

The lacrymal caruncle is a small gland situated between the lids, at the internal angle of the eye; it is oblong and of a conical shape, and is composed of mucous follicles united by cellular tissue, and covered by the conjunctiva: on minute inspection, fine hairs may be detected growing from its surface.

Its office is to secrete a mucus, and to separate the puncta lacrymalia, so that the tears may pass when the lids are closed during sleep: in some individuals it is of a rose-pink colour, in others of a florid red.

The caruncle now and then becomes enlarged, so as to project between the eyelids and prevent their closure: when this is the case, the superfluous portion should be removed, either with the knife or scissors: some prefer caustic, but this will produce a high degree of inflammation, and particular caution is required in using it, to protect the transparent parts of the eye. Sometimes deep scarifications of it, so as to cause

it to bleed profusely, will reduce it to its natural limits: a weak solution of nitrate of silver, or sulphate of copper may be subsequently applied.

I always prefer excision: the eyelids being separated in order to prevent their being injured, the portion to be removed should be seized with a fine hook, and removed by one stroke of a thin knife.

Sometimes a morbid mucus is secreted by the gland, of the consistence of bird-lime, which is accompanied with a troublesome itching: this may be removed by the application of the Ung. Hydr. Nitr. Rubr. Op., or a solution of sulphate of copper or nitrate of silver, in the proportion of four grains of the former and five of the latter in aqua distillata ʒ.: this should be applied with a pencil brush once or twice a day, care being taken not to interfere with the other parts of the organ. Sometimes the fine hairs which grow from the surface of the gland become very long and strong, and turn inwards on the cornea; these should be removed with a pair of forceps. The caruncle is occasionally the seat of cancer.

The valvula semilunaris is nothing more than a duplicature of the conjunctiva, situated between the caruncle and the globe, at the internal angle of the eye: it resembles a crescent, the horns of which are turned towards the puncta lacrymalia, and its office is to assist in conveying the tears to the puncta: a fleshy or membranous pterygium now and then grows from it, which should be removed with the knife.

OF

SOME OF THE DISEASES OF THE LIDS AND THEIR APPENDAGES.

Of Ptosis.—This consists of an inability to raise the upper eyelid, and may arise from a superabundance of integument covering the globe, and is common in elderly people; or from a paralytic state of the levator palpebræ muscle, or from a rigidity or spasmodic affection of the orbicularis muscle, in which case the lid is kept obstinately closed.

When arising from the first cause, it may be cured by the removal of a portion of the superabundant integument: the portion intended to be removed should be pinched up, or included in a pair of forceps, like the hare-lip forceps, and removed by a sweep of the knife; the lips of the wound should then be simply brought together; there is no necessity for sutures, as the loss of substance will cause contraction suffi-

cient, on the same principle as in loss of substance from burns or scalds. Should the patient be timid and afraid of the knife, a portion of integument may be pinched up, and rubbed with the kali purum till an escar is formed, it should then be fomented or poulticed till the escar separates; the wound will then heal, and in healing it will contract the length of the eyelid, on the same principle as the former operation: this is a more painful process, and is attended with greater inflammation.

When it arises from a paralytic state of the levator muscle, the diet and bowels should be regulated, and stimulating liniments, blisters, electricity, cold effusion, and friction employed.

When from a spasmodic affection of the orbicularis muscle, sedative and warm fomentations repeatedly applied will be serviceable. Ptosis is frequently symptomatic of a paralytic seizure, and should then be treated accordingly.

OF

ECTROPIUM OR EVERSION OF THE EYELIDS.

Ectropium is of two kinds, the one arising from fungous growth, or thickening of the inner membrane, lining the eyelids and producing their eversion, which cases are common, as the effect of acute Egyptian or purulent ophthalmy, or scrofula, small-pox, or measles. The other kind is produced by any circumstance occasioning a loss of substance in the integuments of the eyelids, whereby the lid becomes contracted, drawn down, and everted, as from deep burns or scalds, or when, in removing tumours, the integument of the lid has been cut away. The former kind may be easily remedied by removing the diseased membrane of the lids with the knife or scissors, and if necessary, pencilling the part with argentum nitratum: some surgeons prefer removing it with caustic, but in this case they should take care to protect the globe. The latter kind of ectropium, or that arising from a

loss of substance is more difficult of management, and when the loss of substance is very great, it is impossible to remedy it. The principle of cure consists in opposing one cicatrix to another: thus, if the cicatrix in the integument of the lid is not so great but that the lid, on pressure, may be applied to the centre of the globe; the surgeon may, by removing the internal pulpy lining of the lid, occasion such a degree of counter-contraction as shall draw back the lid nearly to its natural situation, and thus remedy the deformity.

OF TRICHIASIS.

This consists of an inversion of the ciliæ, or eye-lashes, on the globe, which if allowed to continue, produces such irritation as to occasion a varicose state of the vessels, and ultimately ulceration, or opacity of the cornea. There are two kinds of trichiasis, in one the ciliæ take a direction inward, but without any inversion of the tarsus: in the other the tarsus, from a cicatrix of the inner membrane of the eyelid, becomes inverted, and draws the ciliæ inward, and this may be either partial or entire, according to the extent or influence of the cicatrix. Sometimes the ciliæ become inverted from a preternatural laxness of the integument of the eyelid, whereby the tarsus loses its support and falls inward: this frequently follows œdema, produced by inflammation in the lids, and is often met with in elderly persons.

The first kind of trichiasis is with difficulty removed, as the ciliæ have been al-

ways found to return when pulled out, and caustic pencilled on the points of the glands. Nothing will effect a permanent cure, except the excision or removal of the tarsus, in the manner recommended by the late Mr. Saunders; care should be taken not to injure the puncta lacrymalia.

The next kind of trichiasis may be easily remedied by opposing one cicatrix to another; a fold of the integument of the lid should be pinched up, either with the forceps or fingers of the operator, just below the edge of the cartilage, which should then be removed either with the knife or scissors; the edges of the wound should then be brought in contact, but no sutures used, for the reasons previously given. Care should be taken not to remove too great or too small a fold of the integument, as in the former case the lid would be too much shortened and everted, and the globe not covered; in the latter, the object of the operation would not be accomplished: the due proportion may be ascertained, by directing the patient to

open his eye whilst the portion to be removed is raised up.

Sometimes a double or treble row of ciliæ grow from the cartilage, constituting what has been termed dystichiasis. The opacity, ulceration, or varicose state of the vessels, produced from the effect of irritation, should be removed by the usual means.

OF STEATOMATOUS, OR OTHER TUMOURS, SITUATED IN THE LIDS.

THESE, if small, should be removed by dividing the integument freely down to them with a sharp lancet or knife, and then squeezing them out with the thumb and finger: they are contained in a capsule, and require a little force to dislodge them; if the operator fears a return, he may pencil the capsule with argent. nitratum; but this I rarely find necessary. When they are large, they should be cautiously dissected out, but by no means remove any integument, unless it is greatly abundant.

When the lids are cancerous, they should be entirely removed.

Wounds of the lids should have great attention paid them, lest they leave troublesome and unpleasant deformities.

OF THE DISEASES OF THE LACRYMAL GLAND.

THE lacrymal gland is of the conglomerate kind, whose office is to secrete the tears: it is divided into two lobes, is situated in a depression of the frontal bone, at the external angle of the orbit, and is confined in its situation by a ligament: it is convex on its superior, concave on its inferior surface, and opens at its anterior edge, by about seven excretory ducts on the conjunctiva, near the border of the tarsus.

The gland is subject to inflammation, and its consequences, deficiency and increase of secretion, suppuration and enlargement, the treatment of which should vary according to the stage of the complaint. Thus, during the acute stage, sedative and soothing fomentations should be applied and the bowels regulated: when the gland has suppurated, which may be known by the inflamed and œdematous state of the lid, or by introducing the point

of the finger under the angle of the orbit, when the fluctuation of the matter will be perceptible, it should be opened with a fine lancet or bistoury, and afterwards kept clean by tepid fomentations.

The gland sometimes becomes prodigiously enlarged and scirrhous, in which case it should be entirely removed, and some authors go so far as even to recommend the removal of the globe with it, since it is almost impossible to define the exact limits of the disease, and this I think is a prudent measure. The gland has also been known to be the seat of dropsy.

OF THE

DISEASES OF THE FOLLICULÆ MEIBOMII AND GLANDS OF THE CILIÆ.

THE folliculæ meibomii are small glands, situated between the tarsus and tunica conjunctiva: they run in parallel lines vertically, with respect to the tarsus, and their openings terminate at its edge: they are more numerous on the superior than on the inferior eyelid, and their office is to secrete a sebaceous fluid, to prevent the adhesion of the eyelids during sleep.

These glands are subject to inflammation, ulceration, which manifests itself in small white spots, and change of secretion; during the former, tepid fomentations are the most proper applications, and in the latter the Ung. Hydr. Nitrat. Rubr., or a solution of nitrate of silver, or the Ung. Hydr. Nitrat. are beneficial; but the strength of these remedies should be regulated by

the degree of irritability in the lids. The bowels should be kept regular, and the diet, air, and exercise attended to, as these affections are generally of a strumous nature.

OF THE

TREATMENT OF THE EYES DURING THE SMALL-POX AND MEASLES.

These two diseases are extremely destructive to vision, and the number of individuals who have been rendered blind, or their sight impaired by one or other of these diseases, has induced me to notice them.

In the small-pox, the sight is destroyed by one or more of the pustules forming on the cornea, which causes ulceration, and disorganization of it, or involves the iris in the ulceration, and produces obliteration of the pupil. When the cornea sloughs, the lens not unfrequently escapes at the opening.

These individuals will be consigned to irremediable blindness, unless there remains a portion of the cornea transparent, sufficient to form an artificial pupil at some subsequent period.

In the measles, the semilunar papillæ appear on the surface of the cornea and conjunctiva, and render the eyes extremely irritable and weak, and frequently lay the foundation of disease, from which they never entirely recover. This mischief may be prevented, by applying cold applications to the eyelids during the eruptive period of the disorders, which will prevent the pustules from forming on the globe. During the measles, tartarized antimony, nitre, and aperients should be given.

I will conclude this work, by remarking that these observations are the result of several years' very extensive practice on diseases of the eyes; during which period, although I never kept a statement, on a moderate calculation, fifty thousand cases must have presented themselves to my notice; and this I mention, not to sound my own praise, but to convince my readers that the practice I have here recommended may be relied on.

NOTE.

SINCE the completion of this Work, I have been much gratified by the perusal of two of Mr. Lawrence's excellent Lectures (in *The Lancet*) on diseases of the eyes; and feel that I cannot sufficiently compliment this gentleman, as all his surgical opinions are truly valuable. It was my intention to have enumerated about fifty authors who have written on diseases of the eyes, whose works may be read with advantage, (but Mr. L. has pointed out those he thinks necessary;) as I consider it absolutely necessary, that those who profess to treat of, or practise on, so delicate an organ as the eye, should be acquainted with the history and progress of this department of surgery; for it has happened that, from ignorance of the writings of the ancients, some of our modern surgeons have claimed for inventions of their own, what is strictly due to the former.

For a knowledge of Optics, I would recommend the study of Newton and Wood.

LONDON:
PRINTED BY WILLIAM CLOWES,
Northumberland-court.

Lately published,

WITH A PORTRAIT AND MEMOIR,

A FULL ACCOUNT

OF

THE SYSTEM OF FRICTION,

AS ADAPTED AND PURSUED WITH THE GREATEST SUCCESS

IN CASES OF

CONTRACTED JOINTS AND LAMENESS, FROM VARIOUS CAUSES.

BY THE LATE EMINENT SURGEON,

JOHN GROSVENOR, Esq., OF OXFORD.

WITH

OBSERVATIONS

ON THOSE CASES TO WHICH IT IS MOST APPLICABLE,

By WILLIAM CLEOBURY,

MEMBER OF THE ROYAL COLLEGE OF SURGEONS, LONDON, AND ONE OF THE SURGEONS OF THE RADCLIFFE INFIRMARY, OXFORD.

THE THIRD EDITION, CONSIDERABLY ENLARGED.

In this Work the late Mr. Grosvenor's system of treating contracted joints, which he practised for a great number of years, and for which he was so justly celebrated, is simply and accurately described. The management of each contracted joint, both in simple and difficult cases, is so minutely detailed, as to put the practitioner in possession of a faithful

account of a system, by means of which many limbs condemned to the knife have been saved, and their use restored. The author has been anxious to do justice to the late Mr. Grosvenor's memory, and flatters himself that practitioners may now be enabled to employ the remedy with full confidence of being in actual possession of his mode of applying it, and consequently, may reasonably expect the same success that attended his (Mr. G's.) practice. The cases that admit of no relief, and those for which it is improper, are so clearly pointed out, that the author trusts that no medical gentleman, nor even private individual, will be liable to err in its application, as the work is adapted to the capacities of general readers.

Sold by Mr. T. Slatter, Herald Office, Oxford; and by Messrs. T. and G. Underwood, London.