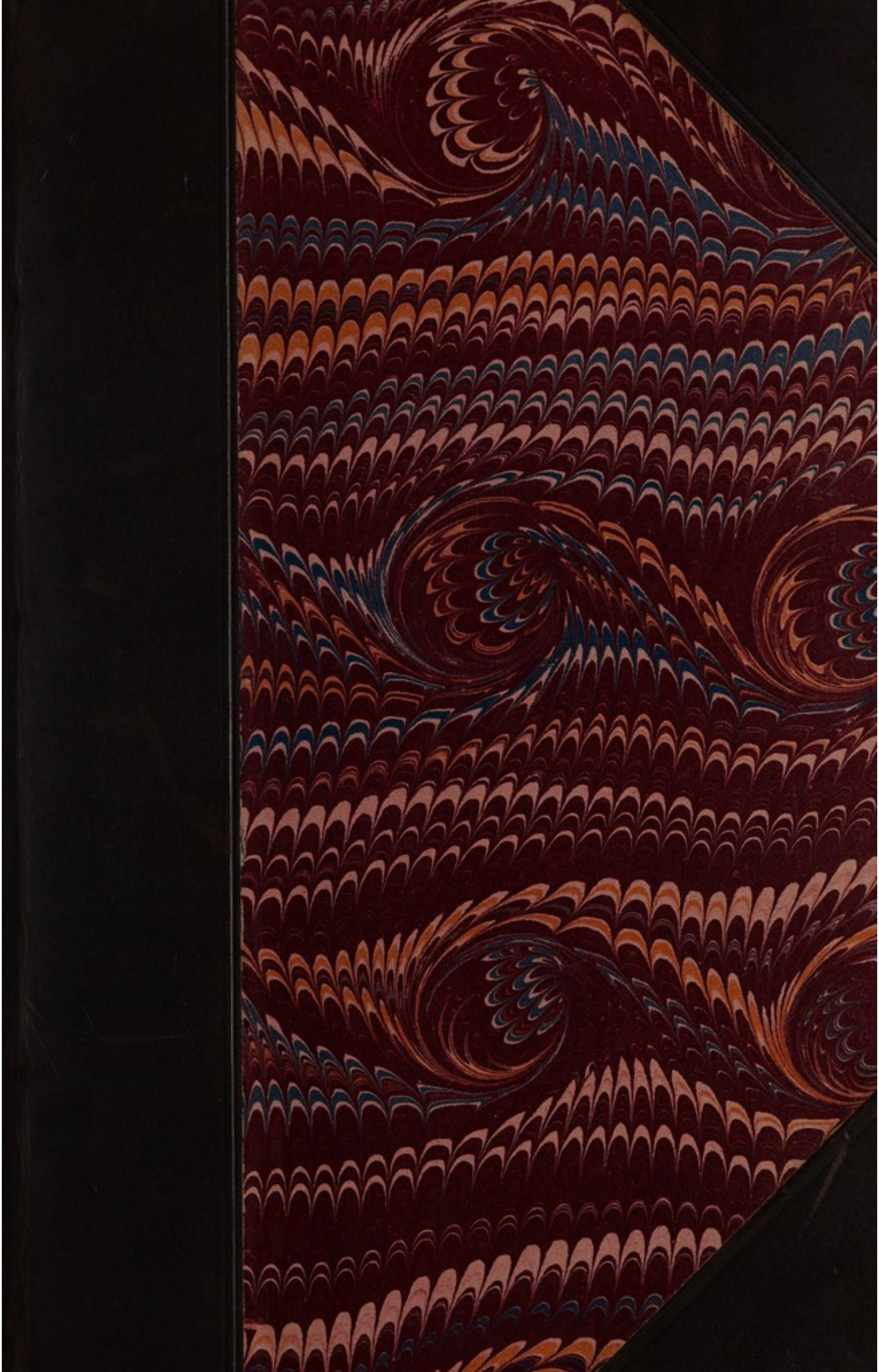
A dissertation on the theory and cure of the cataract: in which the practice of extraction is supported; and that operation, in its present improved state, is particularly described / By Jonathan Wathen.



A

DISSERTATION

ON THE

THEORY AND CURE

OF THE

CATARACT:

IN WHICH THE PRACTICE OF

EXTRACTION

IS SUPPORTED;

And that OPERATION, in its preſent improved State, is particularly deſcribed:

By JONATHAN WATHEN, SURGEON.

Radicitus tollit.

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ON THE

CATARACT.

INTRODUCTION.

THE diſorder of the eye, diſtinguiſhed by the name of the Cataract, has been always underſtood to ariſe from ſome opake ſubſtance, intercepting the rays of light in their paſſage to the immediate faculty of viſion.* This is admitted by all writers on the ſubject;

* Suffuſio quoque, quam Græci υποχυσιν nominant, interdum oculi pupillæ, qua cernit, ſe opponit.

Celſus de Suffuſ. Oculor. lib. 6. chap. 6. pag. 367.

Suffuſio latinis, υπόχυμα Græcis, vulgo cataracta dicitur, ſumpta, uti opinor, denominatione ab illis portis quæ in oppidis, et caſtris, ſuperna deorſum cadunt, et omnem prohibent tranſitum.

Fab. ab Aquepend. pag. 57.

and is, indeed, apparent on a bare inſpection of the eye that is thus affected. But what this obſtructing medium is, or how formed, is a point concerning which very different opinions have been advanced. Of the chief of theſe I ſhall now take ſome notice, in a brief view of the diſcoveries that have been progreſſively made as to the nature of the Cataract, from the earlieſt inveſtigation of it down to the preſent time.

SECT. I.

On the Nature of the Cataract.

Galen, and the greater number of the antients, conſidered the opake ſubſtance as produced by a white ſkin or pellicle, congealed and hardened in the poſterior chamber of the aqueous humour *. They were led into this notion by a perſuaſion,

* Galen de uſu partium, lib. x. cap. 1.

that

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Price THREE SHILLINGS ſewed.

that the cryſtalline lens was the proper ſeat of viſion: inferring hence, and with reaſon, if they had been right in this their firſt idea, that the opake ſubſtance, by which the light was obſtructed, muſt of courſe be ſeated before that humour. And what ſerved very much to confirm them in this hypotheſis, was, that ſome perſons had been reſtored to ſight by a depreſſion of the cataract. This operation, they concluded, could not have anſwered its ſalutary purpoſe, but on the ſuppoſition that the ſeat of the cataract was not in the cryſtalline humour itſelf, but in ſome intervening ſubſtance formed before it: becauſe, otherwiſe, the faculty of viſion, as they conceived of it, muſt, by ſuch a proceſs, have been removed from its place. Some among them, having doubts as to the poſſibility of ſuch a ſubſtance or membrane being formed out of the aqueous humour, were rather of opinion that it was occaſioned by a kind of film, or perhaps by a lamen, ſeparated

from the ſurface of the cryſtalline; which, becoming opake, expanded itſelf before the ſight. But, in oppoſition to the whole of that antient theory; we now know with certainty, that the cryſtalline lens, being contained within a ſmooth and tenſe membrane, muſt itſelf be prevented from throwing off any layer; and that the tunic, in which it is included, cannot, from its very nature, admit of ſuch a ſeparation. In the year 1604, Kepler proved, that the cryſtalline was unable to retain the rays of light, on account of its tranſparency; and that this humour was in fact no more than a convex lens, ſo diſpoſed for the purpoſe of refracting theſe rays in their paſſage through it to the retina*. By thus diſpoſſeſſing the cryſtalline of the attribute of viſion, he greatly aſſiſted in promoting a right idea of the diſorder we are conſidering. Yet ſo great was the attach-

* Vid. Kepl. Paralipomena ad Vitellionem.

ment to the long eſtabliſhed opinion of the cataract's being a pellicle in the aqueous humour, that it continued to prevail even in the beginning of the preſent century; though the contrary was clearly ſhewn, by many experiments made by Maitre Jan, in 1707, by Briſſeau in 1709, and by M. Heiſter in 1711. The laſt named celebrated Anatomiſt, in the preſence of a great number of the faculty, diſſected the cataractous eye of a ſoldier, who died of a wound received in battle; and demonſtrated, that the cryſtalline lens itſelf was opake, to the entire ſatisfaction of his audience. This obſervation, with another to the ſame purpoſe, being ſoon afterwards publiſhed in the Ephem. Nat. Cur. Cent. 1, 2. he was ſpeedily engaged in a warm controverſy with ſome of the faculty, who were ſtrongly attached to the old ſyſtem. Nor did the conteſt ſubſide, till he had publiſhed ſucceſſively, his Tractatus de Cataracta in lente cryſtalline, 1711 — De

Glaucomate and Amauroſi, 1713 — and his Vindiciæ againſt Woolhouſe, 1719— by which publications he may be ſaid to have obtained a compleat victory. I am not unapprized, that this true idea of the cataract was delivered in lectures, and then publiſhed, by Rohault, Borelli, and others, near eighty years before this period. But as that opinion, however true, was chiefly, if not entirely, founded upon ſpeculation; it had little or no influence, and ſeems to have been forgotten; till the ſubject was revived by Maitre Jan, and afterwards fully explained by M. Heiſter. The latter writer obſerves, that few or none, before his time, took the pains to diſſect any eyes that had been affected with this diſorder*. From this period, it has been univerſally admitted, that a true cataract implies an opacity of the cryſtalline lens: and that when this opacity is partial only, the ſight is depraved; but, when quite transfuſed over

* Heiſter's Surgery, part 2. page 402.

the lens, is then entirely deſtroyed by it. There are, however, beſides this true and genuine cataract, two appearances greatly reſembling it; and which are very ſimilar to each other: though they are in reality, as they are commonly denominated, only ſpurious cataracts; and, on account of their ſituation, which is alſo behind the iris, may eaſily be miſtaken for the true one. Of theſe two ſpurious cataracts, one is an opake adventitious membrane, expanding itſelf acroſs the poſterior chamber of the aqueous humour, between the cryſtalline and the pupil; in exact agreement with the idea which the antients entertained of the true cataract. The other ſpurious cataract is alſo of the membranous kind; and is cauſed by an opacity of the capſula of the cryſtalline lens. This laſt diſtemper of the eye was not perfectly known before the extraction of the cryſtalline by Daviel; by whom it was accurately deſcribed, as well as operated upon with

ſucceſs. But of both theſe ſpurious cataracts, as alſo of a third ſpecies, which is not membranous; I propoſe to treat hereafter diſtinctly.

SECT. II.

On the Cauſes of the Cataract.

Maitre Jan was of opinion, that an acid ſeroſity, forming itſelf ſometimes ſuddenly by fluxion, and at others ſlowly by congeſtion, gave riſe to the cataract*. This acid he ſuppoſed to act firſt upon the ſuperficies of the cryſtalline; and gradually to inſinuate itſelf further and further into its ſubſtance, till at length the whole body of that humour was hardened and rendered opake by it: but that the acid acted in a different manner upon the membrane containing the cryſ-

* Vid. Traité des Maladies de L'Oeil par Maitre Jan.

talline;

talline; and, instead of hardening, softened, and at length totally consumed it.

St. Yves says, that the cataract arises from an obstruction in those vessels which supply the crystalline with nourishment; and supposes it to be owing to this, that the fluids in the inside of its capsula stagnate, grow acrid, and ferment; in consequence of which, a total dissolution of the substance of the crystalline first ensues; but that this humour afterwards returns into an harder consistence: and, as it grows solid, advances towards the hole of the pupil *.

These opinions of Maitre Jan and St. Yves, so contrary to each other, and erroneous in themselves, would scarcely deserve recital; were it not for the practical influence they appear to have had upon the operation of couching. But by

* Traité des Maladies des Yeux, par M. St. Yves, chap. 14.

late

late diſcoveries, made in extracting the opake cryſtalline, theſe, together with ſome other miſtakes concerning the conſiſtency of the cataract in its different ſtages, are made very apparent.

Maitre Jan ſuppoſed the cauſe of obſtruction firſt to form upon the ſurface; but the operation laſt mentioned ſhews, that it generally commences in the center of the cryſtalline: ſpreading and encreaſing outwardly, till the whole becomes opake. And in reſpect to the deſtruction of the capſula, which, he ſays, takes place before the opacity of the cryſtalline begins; there is no one, who performs the operation of extracting the cataract, but knows, that the capſula always exiſts, and that the puncture of it, is neceſſary to give an eaſy paſſage to the cryſtalline.

The ſuppoſed diſſolution of the cryſtalline by St. Yves, and its ſubſequent in-

ſpiſſation,

ſpiſſation, which laſt is an effect very ſimilar to the ultimate hardneſs deſcribed by Maitre Jan, have, without doubt, both together contributed to the general, but falſe, idea, that this diſorder paſſes through certain regular ſtages, before it arrives to a ſtate of maturity. By maturity they always meant hardneſs, or ſolidity; as a quality, which they deemed eſſential to a ſucceſsful depreſſion of it. But we find, on the contrary, by extraction, that many recent cataracts are as firm as the cryſtalline in its natural ſtate; whilſt others of long ſtanding are ſoft and fluid: and vice verſa. In ſhort, there is nothing more variable and uncertain, than the conſiſtence of the cryſtalline when cataractous; and, conſequently, that circumſtance never could at all determine the proper time of depreſſing it. From what has been ſaid, it appears, that the internal cauſes of the cataract, as well as the nature of its progreſs, are both very obſcure and uncertain.

An opacity of the cryſtalline lens is often cauſed by external violence. But when it is thus occaſioned, other parts of the eye, beſides that which is the immediate ſeat of this diſorder, uſually receive ſome injury at the ſame time. Hence it naturally ariſes, that, in theſe caſes, the cataract is leſs ſimple, or more complicated, than when it proceeds from an internal cauſe only: to which, however, there are ſome exceptions.

It has alſo been obſerved, that ſudden expoſures of the eye, from extreme darkneſs to intenſe light, and the alternatives of cold and heat,* have been the means of bringing on a cataract.

This diſorder is certainly moſt incident to perſons who are advanced in years;

* I have ſometimes thought that Blackſmiths, and all Mechanicks, who work near large fires, are more ſubject to cataracts than other perſons; and I have had two patients, who were inſtantly ſeized with them, at the very time they were thus employed.

though

though there is no period of life, at which it has not been known to take place. Many children have been born with this complaint; and many young, or middle aged perſons, have been either ſuddenly or gradually taken with it. And though, in the latter inſtances, ſome known imprudences may have contributed as cauſes, to bring it on: ſuch as, drinking cold water, or plunging the feet in it, when the body was more than ordinarily heated; it may yet take place, where nothing of that kind has been done; and does ariſe in numberleſs inſtances, where no particular cauſe can be aſſigned for it. It is not very uncommon for a cataract to come in one eye, without the patients diſcovering it, for ſome conſiderable time after its formation.

SECT.

SECT. III.

On the Symptoms of the Cataract.

This diſorder, which, as was before obſerved, generally begins in the center of the cryſtalline lens, is firſt perceived, ſome way behind the iris and poſterior chamber of the aqueous humour. As the opacity increaſes, the cryſtalline, becoming every way proportionally more affected with the ſame appearance of whiteneſs, which it firſt ſhewed only in its center, the anterior part of it, or that which lies nearer to the pupil, is of courſe rendered more conſpicuous. Hence the antients ſpeak of the cataract as approaching, or moving forward, towards the pupil; as if it really underwent a change of ſituation. Whereas, the truth of the caſe is, its ſituation is no otherwiſe altered, than that the opacity has ſpread further; and in that part too which being

being neareſt the pupil, is alſo neareſt to the ſurface, and lies more open to the eye of the beholder. From theſe viſible ſymptoms of a cataract, and which may therefore be called external ſymptoms; I now paſs on to ſpecify thoſe occult ones, of which the patient alone is ſenſible, and which may, on this account, properly be diſtinguiſhed by the name of internal. The firſt internal ſymptom of the beginning of a cataract is, the influence it has on the objects of ſight; by cauſing the more minute ones to appear to the eye of the patient, as if they were covered with a miſt; or, as the patients themſelves ſometimes deſcribe it, as ſeen through horn. This ſeeming miſt, or obſcurity of the object, never goes off; but always encreaſes, either more rapidly or gradually, as the opacity ſpreads. By the fixedneſs of the miſt, the incipient cataract may, in general, be diſtinguiſhed from many temporary adumbrations of the ſight; as well as from thoſe viſual ſenſations which

are

are occaſioned by the Gutta Serena: ſuch as, the appearance of duſt, cobwebs, flies, &c. &c. floating in the air before the eye. St. Yves and others, indeed, conſider all the ſymptoms laſt mentioned, as equally attendant on the cataract and the gutta ſerena*: but from all I have yet been able to aſcertain, they have not the leaſt neceſſary connection with the former, though they are inſeparable from the latter †.

* I have uſed the term Gutta Serena, here and elſewhere, for thoſe numberleſs diſeaſes within the globe of the eye, of which we know very little; and that only of their effects.

† When a cataract ſucceeds, or is accompanied by, ſtrong ſymptoms of the gutta ſerena, there is good reaſon to apprehend, that an eye thus affected would remain blind, even if the cataract itſelf were depreſſed or extracted in the beſt manner. But this is nothing more than what we are taught by antient as well as modern obſervation; and proves only, that a cataract and a gutta ſerena may exiſt at one and the ſame time. And this I here notice, merely as it may afford ſome aſſiſtance in forming a judgment, as to thoſe caſes of the cataract, in which the operation is moſt likely to ſucceed.

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They, who have incipient cataracts, ſee clearer in the duſk of the evening, than in the brighter light of the day. The reaſon of this is, that when the light is leſs, the pupil is then more dilated, and affords ſufficient room for the rays of light to paſs through the yet tranſparent circumference of the cryſtalline to the retina. But when the light is ſtrong, the pupil contracts itſelf, and hides the tranſparent part of the cryſtalline behind the iris; and thus prevents its paſſing, as before, to the bottom of the eye. On the contrary, an eye recently affected by the gutta ſerena is aided by the brighteſt light: for, in that it beſt ſees external objects; and it is then alſo moſt ſenſible of thoſe morbid appearances of flies, &c. before noticed; at leaſt, ſo long as it can ſee at all.

In order to account for this laſt mentioned circumſtance attending the gutta

 ſerena,

ſerena, ſo very different from what was before obſerved of the cataract; we muſt, for the preſent, ſuppoſe the retina—which lines almoſt the whole interior ſurface of the choroides—when in its healthful ſtate, to be the ſeat of viſion; and if diſordered, of the gutta ſerena. The greater this inſenſibility of the retina is, the leſs capable it will be of impreſſion by the rays of light. In conſequence of this, the pupil will dilate itſelf, to admit as large a quantity as poſſible of thoſe rays to the bottom of the eye; without which, it would ſee but little, even for ſome time, before the gutta ſerena was confirmed. The enlargement of the aperture of the pupil, by the repeated efforts of the iris, muſt of courſe diminiſh the ſpace occupied by the latter: and hence it is no uncommon thing, for that membrane, in a fixed gutta ſerena, to be contracted to the appearance of little more than the outer edge or periphery of a circle,

cle, corresponding with the margin of the cornea*.

As the cataract is most common to persons, who are somewhat advanced in years; the affected eye is, in general, presbytal as well as cataractous. Notwithstanding this, the latter may, for a time, like the former, be benefited by the use of a convex glass, which, by magnifying the object, will cause it to be seen through the mist or cloud; though that, as well as

* To these two and most common effects of the presence and absence of light on the iris, in the cataract and gutta serena, there are some few exceptions. In a case of the latter kind, we have seen a moveable iris, and a moderate sized pupil, in a well looking eye, where there was not the smallest degree of sight; and, in one of the former sort, an immoveable iris, and dilated pupil, where the cataract, in an otherwise apparently sound eye, was so large, as not to admit the least ray of light between itself, the iris, and processus ciliares, to the retina. Such instances as these, however rare, ought to put the practitioner upon his guard, in giving an opinion of the state of vision, from a bare inspection of the eyes of a patient.

the object itſelf, will be thereby rendered more viſible to the patient; till by an encreaſe of the opacity, the glaſs becomes no longer uſeful. This cloud or miſt, which intervenes between the object and the ſight, affords a criterion of ſome certainty, whereby an incipient cataract may, in general, be diſtinguiſhed not only from the gutta ſerena *, but alſo from the ſimple preſbitia or long ſight; in which laſt, the object, eſpecially if it be ſmall,

* It is obvious, that theſe marks of diſtinction reſpect only the incipient and progreſſive ſtate of the cataract and gutta ſerena; and that they muſt neceſſarily ceaſe, when either of theſe diſorders are arrived at maturity. But even theſe diſtinctions, which are founded upon repeated obſervation, muſt not invariably be our guides in practice. For, when a cataract comes upon an eye, in which the antecedent ſymptoms of the gutta ſerena were but ſlight, they do not then afford an inſuperable objection either to depreſſion or extraction; as the latter diſorder may never increaſe, while the operation proves an effectual cure to the former. I lately operated, by extraction, on an eye in this ſtate; in conſequence of which, the patient, though the black ſpecks remain, can now ſee to read or work with ſpectacles.

always appears confuſed, but never clouded; and this confuſion is at any time inſtantly removed by a convex glaſs, if the focus is ſuited to the eye affected.

It will caſt ſome light on the ſubject, to enter a little here into the conſtruction of the globe of the eye; of which the following deſcription may ſuffice.

The Eye deſcribed.

The globe of the eye is compoſed of three proper coats—the ſclerotica, choroides, and retina—and contains three tranſparent humours—the aqueous, the cryſtalline, and the vitreous—

The ſclerotica is the outermoſt of theſe tunics. It is of a thick and firm texture: quite opake in its poſterior and far greater part; but in its anterior, tranſ-

 parent;

parent; and takes the name of cornea. The cornea projects conſiderably beyond the ſclerotica, ſo as to form part of a much ſmaller ſphere. It is perfectly circular, where it is connected with the former; making in the whole a circle of about half an inch diameter, it may be a little more or leſs.

The choroides is ſituated within the ſclerotica, between it and the retina. It is a thin opake membrane, ſupplied with a great number of blood veſſels and nerves. Round the margin of the ſclerotica, where the cornea begins, the choroides is ſtrongly attached to it; whence it paſſes forward and becomes viſible through the tranſparency of the cornea. This part of the choroides is called the iris; being of various colours in different perſons, as grey, black, &c. It is perfectly opake in itſelf, but has a round hole in its center, called the pupil, which is the paſſage for the rays of light into

the

the eye. The two orders of muſcular fibres, with which it is furniſhed, enable it to contract or dilate the pupil, according as the degree of light is greater or leſs; ſo that, properly ſpeaking, the hole of the pupil is, in itſelf, of no determinate ſize. The iris is ſupplied with ſo great a number of blood-veſſels and nerves, as to be very ſuſceptible of irritation and inflammation; and the almoſt conſtant effect of the latter is the entire or partial contraction of the pupil, by which the ſight is either wholly loſt, or conſiderably impaired. The inſide of the choroides and iris, particularly the laſt, is lined with a thick, black, pulpy ſubſtance, called nigrum pigmentum: and on the inner and anterior part of the choroides are ſituated a great number of ſmall oblong fibres, called proceſſus ciliares; which alſo are covered with a conſiderable quantity of the nigrum pigmentum. Theſe ciliary fibres run over the fore part of the vitreous

humour; and terminate at the margin of the capſula of the cryſtalline. The uſe, for which they are deſigned, is, to alter the poſition of the cryſtalline, in order to conform the eye to the different objects before it, whether great or ſmall, near or diſtant: beſides which, the pigment on the inſide of them, as in the iris, anſwers the further purpoſe of abſorbing the rays of light; and preventing the reflection of ſuch, as would be an impediment to diſtinct viſion. Though anatomiſts differ ſomewhat in their notions as to the ſtructure of theſe proceſſes; they are yet, in general, agreed with reſpect to their uſes, and that they are thoſe juſt pointed out.

The retina, or innermoſt of theſe tunics, is thought to be an expanſion of the medullary part of the optic nerve. It is white, thin, and of a ſoft and delicate texture. It lies immediately behind the vitreous humour; round which it is continued

tinued to the border of the cryſtalline; and is generally ſuppoſed to be the immediate ſeat of viſion.

The aqueous humour is the moſt fluid of all, nearly as limpid and colourleſs as water; and lies in the anterior part of the eye, ſo as to fill up the whole ſpace between the cornea and cryſtalline. This ſpace, by the intervention of the iris, is divided into two chambers, which are called the anterior and poſterior chambers of the aqueous humour. The anterior chamber is conſiderably larger than the poſterior; as appears from the experiments of Morgagni, Heiſter, and Petit, upon freſh eyes, when the humours were frozen. It was formerly ſuppoſed, that the cryſtaline humour was placed nearer the center of the eye, than it has been ſince found to be; and in conſequence of this, the quantity of aqueous humour was then thought to be much greater than it really is. The weight of the aqueous humour,

mour, as eſtimated by the moſt accurate experiments, is found to be nearly equal to that of the cryſtalline; and in the proportion of one to twenty-five of the vitreous humour.

The cryſtalline lens is placed next to the aqueous humour; and at a ſmall diſtance behind the pupil. In its healthful ſtate, it is equal to the pureſt cryſtal in tranſparency; and though it is not of the ſame conſiſtence throughout, being much firmer in the center than in its circumference; it is yet, upon the whole, abundantly harder than either of the other humours of the eye. Its ſhape is lenticular, or convex on each ſide; and it is contained in a tranſparent capſula, connected with the large circumference of the iris, by means of the ciliary proceſſes. The anterior part of the capſula is much firmer than the poſterior; but the latter is found, by injections, to be moſt vaſcular. There is, however, a great difference in the firmneſs

firmneſs of the capſula, in different eyes; as appears from the much greater comparative eaſe with which it is punctured in ſome than in others *. The capſula of the cryſtalline, in its natural ſtate, is either a continuance of the membrane which includes the vitreous humour; or it is ſo attached to it, that they cannot be ſeparated without laceration: in which ſtate, the ſlighteſt compreſſion on the eye will cauſe a diſcharge of ſome of the vitreous humour. This is generally the caſe, in the cataractous, as well as in the natural, ſtate of the cryſtaline: though there are ſome inſtances, in which this attachment ſeems diſſolved, and the cataract and capſula have been brought away entire by extraction, and with little or no preſſure upon the globe of the eye. In ſuch caſes, the anterior part of the vitreous humour is ſtill retained in its place by its own pro-

* Portio anterior pellucidiſſima quidem, ſed valde elaſtica et ſatis craſſa: eſt cornea fere.—Zinn. deſcript. ſtruct. anat. ocul. human. cap. 5. §. iii. pag. 122. De Capſula Lentis.

per

per capſula. Three cataracts of this ſort are now in my poſſeſſion. The body of the cryſtalline does not appear to have any connection with the capſula that contains it; but to float in a ſmall quantity of watery fluid, which eſcapes as ſoon as the capſula is perforated.

The vitreous is the largeſt of all the humours; and fills the greateſt part of the globe of the eye. It is limpid, gelatinous, and is of a little more conſiſtence than the white of an egg. It is ſurrounded by a ſtrong, tranſparent membrane, called tunica vitrea, which lies immediately in contact with the retina. In the middle of its fore part, it has a ſmall depreſſion, to receive the poſterior portion of the cryſtalline lens.

In the preceding brief account of the ſeveral component parts of the eye, is included all that the ſubject we are conſidering ſeems to require. I ſhall only add,

add, by way of remark upon it, that the general ſtructure of this organ is much the ſame in all other animals, as in man; though it differs in ſome particulars. This being the caſe, I would ſtrongly recommend it to young practitioners, to make frequent experiments on the eyes of brutes; as they can be eaſily procured, and the practiſing on them cannot but be of the greateſt utility in rendering the operator more expert in the buſineſs of the human eye.

I now go on to the chief part of my deſign, which is to treat of the cure of the cataract.

SECT. IV.

General Remarks on the Cure of the Cataract.

Though my principal ſubject here will be the operations, in uſe for the removal of

of this diſorder; it may yet be proper, firſt of all, juſt to notice the medicinal way, in which it has been ſometimes treated.

It is obſerved by M. Heiſter *, that there are not many inſtances of recovery from a cataract, where it has been left to nature only †: and it is no leſs true, that when the cryſtalline lens is become wholly opake, it is then equally incapable of being relieved by any medicine whatſoever;

* Heiſter's Surgery, part 2. page 402.

† There are, however, ſome few caſes of this kind. St. Yves ſaw two ſuch; one in a man, the other in a dog. I am myſelf well aſſured, that two cataracts, one in each eye, after continuing for eighteen years, entirely diſperſed of themſelves; and the patient ſaw perfectly, during the remainder of life, which was not leſs than ſeven years. After an attempt lately made to extract a cataract, the Operator was obliged to deſiſt; as he could not, by his utmoſt endeavours, fix the eye: in about a fortnight from that time, the patient began to ſee a little; and, in ſomewhat more than three weeks, perfectly recovered his ſight.

not-

notwithſtanding the boaſts which have been ſometimes made of cures performed in this way.

If medicines are preſcribed at all; they ſhould certainly be uſed in as early a ſtate of the diſorder as poſſible. It has been ſaid, that calomel, ſublimate, hemlock, bliſters and bleedings on different parts of the head, neck, &c. have been ſerviceable in theſe caſes: but of this I can ſay nothing from my own experience. Both the electric wind, and æther, not only ſeem likely, from their extreme fineneſs and volatility, to penetrate further than moſt other medicines; but I have reaſon to believe, that ſome incipient cataracts have been prevented from increaſe, and that others have been really diminiſhed, by the outward application of them, jointly or ſeparately; and, at the ſame time, taking the æther inwardly. Theſe inſtances of ſucceſs may, perhaps, be a ſufficient warrant for repeating the like

like experiments; though no great dependance ſhould be placed upon them. But, after all, the moſt certain method of curing the cataract is by the removal of it, in one of the two ways of operation commonly uſed for the purpoſe; that is, by couching, or extraction: and I wiſh it to be carefully attended to, that where the ſight is wholly obſtructed, it is not poſſible that it ſhould be reſtored, but by one or other of theſe operations.

The firſt mode of operating upon the cataract, of which we have any knowledge, was by couching. In this way, the opake ſubſtance, which forms the cataract, is diſplaced, and depoſited at the bottom of the eye; ſo that the rays of light have again free acceſs to the retina. This operation is of very early antiquity; and was performed long before the true nature of the diſeaſe itſelf was underſtood: it being mentioned by Celſus, who lived at or about the commence-

ment

ment of the Chriſtian Æra *. In the other method of removing the cataract, called extraction, the opake lens, inſtead of being depreſſed, is taken out of the eye. It is of much later date than the former; and, as will be ſeen hereafter, was not introduced into practice till the middle of the preſent century. It is on this latter mode of operation that I propoſe chiefly to inſiſt; both on account of its great utility, and becauſe ſo little has hitherto been written on the ſubject. But there are ſome other things, to which it is neceſſary that I previouſly direct the attention of the reader.

* Celſ. Id. lib. 7. §. 14. de ſuffuſione.

SECT. V.

How to diſtinguiſh the true Cataract, and its Fitneſs for Operation.

By attending to the natural ſeat of the cryſtalline, and its relative ſituation with reſpect to the iris, pupil, cornea, &c. the true cataract may be certainly diſtinguiſhed from the ſpurious one, called the adventitious membrane, already mentioned. It is not, however, always ſo clearly diſtinguiſhable from the opacity of the capſula cryſtallina, which forms another of the ſpurious kind, termed the ſecondary cataract; owing to the nearneſs of the two diſtinct parts affected, in the genuine cataract, and in caſes of the latter ſpecies. And yet, though no one rule of judging can be laid down, by which to diſtinguiſh the true cataract from the diſorder laſt mentioned; ſtill, a cloſe compariſon of ſeveral circumſtances together will, in general, determine,

termine, with a good degree of certainty, whether it be the one or the other. Some of theſe circumſtances may be collected from the preceding anatomical deſcription; others, from the ſubſequent account of fitneſs and unfitneſs for operation: beſides which, others again may be collected from what will be hereafter ſaid on the two ſpecies of membranous cataracts. I have here nothing more to notice, but that the opake capſula may either exiſt alone, or be accompanied by an opacity of its lens, and by other circumſtances, which will alſo be pointed out.

The fitneſs of the true cataract for operation, as the relief of the patient depends not a little upon it, is alſo a point which ſhould be attended to with the utmoſt care. And, becauſe I look upon this to be ſo very important; I ſhall lay down ſome diſtinct criteria, which determine both its fitneſs and unfitneſs.

To prove it fit; it is neceſſary — (1) That the eye ſhould be capable of diſcerning a bright light, though it be blind as to all uſeful purpoſes.

(2) That the pupil ſhould immediately contract, on a ſudden expoſure to light; and as readily dilate, on a removal from it. This is neceſſary, to demonſtrate the ſenſibility of the retina; without which there cannot be the leaſt hope of ſucceſs.

(3) That the eye retain its natural figure and ſize.

(4) That the cataract be of a pearl, or light grey colour: for theſe indicate a ſound and healthful ſtate of the eye in other reſpects *.

(5) That the obſcurity, hanging over objects as perceived by the patients, be that of a cloud or miſtineſs; and that this

* Nam ſi exigua ſuffuſio eſt, ſi immobilis, colorem vero habet marinæ aquæ, vel ferri nitentis, & a latere ſenſum aliquem fulgoris relinquit, ſpes ſupereſt.

Celſ. Id. pag. 433.

miſtineſs

miſtineſs increaſe, as the eye becomes more affected, till the ſight is entirely loſt. All theſe circumſtances muſt unite, if the cataract be in a fit ſtate for operation; whether the diſorder has been of ever ſo ſhort or long duration—

But ſhould a cataract of this deſcription affect one eye, while the other retains its perfect ſight; there can then certainly be no juſt occaſion for any operation at all: becauſe every purpoſe of ſight may be ſufficiently anſwered by the uſe of that one eye only. And, in all ſuch caſes, there is this ſtrong reaſon againſt an operation, that the removal of the cryſtalline from one eye, will render the focus different with reſpect to the other: ſo that thoſe patients, who, through a reſtleſs deſire to better their ſtate, were not to be withheld from trying the iſſue of an operation, have ſeldom found it to anſwer their purpoſe.

The following are equally clear and determinate ſigns of an unfitneſs in the cataract for operation.

(1) When the patient cannot diſcern day from night.

(2) Where the pupil is either very large or very ſmall; when it neither contracts nor dilates; when it is jagged; or if it is only in part moveable.

(3) When the eye is unequal; or the ſphere of it is become either greater or leſs than its natural ſize.

(4) When the colour of the cataract is red, blue, yellow, of a brown dark hue, or of a ſnowy white; any one of which appearances generally indicates ſome other diſorder of the head, or in the eye *.

(5) Where the cataract was preceded by ſenſations like thoſe produced by flies,

* Si magna eſt, ſi nigra pars oculi, amiſſa naturali figura, in aliam ſi vertit, ſi ſuffuſioni color cæruleus eſt, aut auro ſimilis, ſi labat & hac atque illac movetur, vix unquam ſuccurritur. Celſ. Id.

cobwebbs, &c. floating before the eye; or where it was accompanied with head-ach's, or cauſed by blows, or by any acute or chronic diſorder of the head, or in the eye itſelf †—

Should a cataract, attended with any one or more of the circumſtances juſt recited, preſent itſelf to our inſpection; they muſt, at leaſt, make the caſe doubtful; if not clearly determine its unfitneſs either for couching or extraction.

The caſe of children is peculiar to itſelf. On them it can never be ſafe to perform either of theſe operations, on account of the reſiſtance that is to be expected. For this reaſon, it muſt of neceſſity be deferred, till they are of an age, to be made ſenſible of its great utility; and can be perſuaded to concur with the operator,

† Fere vero pejor eſt, quo ex graviore morbo, majoribus capitis doloribus, vel ictu vehementiore orta eſt. Celſ. Id.

in keeping the eye ſtill; on which the whole effect of the operation immediately depends.

I now go on to treat of the operations themſelves, which are in uſe, for the cure of the cataract: of which, couching, the earlieſt mode will be firſt inſiſted on, in the following ſection.

SECT.

SECT. VI.

On the Operation of Couching—A Deſcription of it; and a brief Account of its Effects.

The principal and, indeed, the only inſtrument requiſite for couching, or depreſſing the cataract, is, what is called the couching needle. The ſhape of this inſtrument has been occaſionally varied, according to the fancy of the operator. Some have preferred a fine, round, and ſharp pointed needle; others, one of a flat conſtruction, but either narrower or broader, as hath been thought fitteſt for uſe; to which laſt was ſometimes added a ſulcus or groove towards the point *. The ſpe-

* Which of theſe was uſed by Celſus is in ſome meaſure uncertain. His words, according to Doctor Grieves's reading, are,—Tum acus admovenda eſt acuta, at certe non nimium tenuis. Grieves's Celſ. pag. 404. N. (m).

culum, which was formerly in uſe, has been long laid aſide by the beſt operators in this way: not only as hurtful, by its preſſure on the eye; but alſo as leſs certain in its application than the fingers, for the propoſed end of keeping the eye ſteady *.

The patient, being placed before the operator upon a ſeat of convenient height, is ſupported by an aſſiſtant; who, the patients head leaning againſt him, elevates and ſuſpends the upper lid with his fingers—the operator then depreſſes the lower lid with the bulb of his two fore fingers; and, by applying their extremities, at the ſame time, on the conjunctiva, juſt below the cornea, fixes the eye.

* It does not appear that Celſus uſed a ſpeculum, or even his fingers, to fix the eye. He ſays, the diſordered eye may be kept ſufficiently ſtill, by laying wool upon the other, and tying it on. Celſ. de Med. &c. page 434.

ne globe of the eye is then pi
by the needle, in the ſclerotica; at a ſmall diſtance from the outer margin of the circle of the cornea, and a little above the center of the pupil. The needle, if it be of the flat conſtruction, and conſequently edged, is introduced with its flat ſides perpendicular; and as ſoon as it is ſeen to be got behind the pupil, is then turned, ſo as to reſt, or lie flat, upon the upper part of the cataract. The point of the needle is now preſſed downward; cauſing the opake lens to deſcend beneath the lower margin of the pupil. If, on lifting up the point of the needle, the cataract is obſerved to riſe; it is to be preſſed down: and repeatedly, if neceſſary, till it remains in the bottom of the eye. Should the cataract be fluid, either wholly or in part, and therefore incapable of being depreſſed; in this caſe, the inciſion made in the capſula muſt be enlarged, that the aqueous humour may be freely admitted into it: for by this, as a menſtruum, the

opake

opake ſubſtance, if ſoft, or only turbid and milky, will ſome time after the operation, diſſolve and become tranſparent *.

If, on the other hand, the cataract ſhould be, wholly or in part, ſolid; and it is ſeen to riſe again, notwithſtanding all the efforts of the operator to keep it down: he will then be under the neceſſity of ſubdividing it into ſeveral very ſmall pieces; by which it will be reduced to a ſtate ſomewhat ſimilar to the former or ſoft cataract. By this means, the aqueous humour will have the ſame diſſolving effect upon it, as in the firſt inſtance; and when that effect is compleat-

* More than a century ago, our countryman, Mr. Baniſter, as appears from the following account, treated the ſoft cataract in this way—"Preſſing it "down," ſays he, "with my needle on every ſide; "by this meanes, I have ſeen and proved ſometime, the "groſſeſt part of the cataract to fall away and become "lower, the thinner part to be looſed and conſumed, "and in the end the partie hath recovered his ſight." Treatiſe of the Eyes, A. D. 1622.

ed,

ed, the patient's ſight will of courſe return *.

When

* If a large portion of the cataract is left in the eye, without being thus divided, it will either remain there undiſſolved and in its original ſtate; or, if it advances forwards, whether to the hole of the pupil or before it, will, in either caſe, effectually block up the paſſage of viſion, and render all that had been done entirely fruitleſs. This has been long known to be true in fact: and it ſeems not to have eſcaped the notice of ſome of the moſt ancient as well as modern practitioners. Celſus has clearly aſſerted it as the reaſon, for which he recommended this practice of making diviſions in cataracts of the harder ſort, when they could not be cured by depreſſion—Si ſubinde redit, eadem acu magis concidenda, & in plures partes diſſipanda eſt.—Celſ. Id. pag. 434.—Mr. Pott recites a paragraph from Sir William Read to the ſame purpoſe; and ſtrongly ſupports the practice from his own experience. Remarks on the cataract, page 30, &c.

If, after all, a large portion of the cataract ſhould ſtill remain in its original ſtate, and is found to reſiſt all efforts, then made, to depreſs or divide it; nothing remains but to wait a more favourable opportunity for operating upon it. But if the part, which remains, has proceeded to the hole of the pupil, or paſſed through it into the anterior chamber of the aqueous humour;

it

When the operation is finiſhed, the eye-lids muſt be cloſed; a pledget of ſome mild cerate laid upon them, covered with a thin bolſter of linen; and the whole kept on by a band pinned to the night cap.

The patient's head is to be laid ſomewhat high in bed; to prevent the cataract from riſing again: an opiate ſhould be given immediately; and an abſtemious regimen carefully obſerved, till the cure is compleated *.

But,

it muſt then be extracted in the ordinary way, by an inciſion of the cornea. Whatever is to be done, muſt not be long deferred; as any conſiderable delay may occaſion adheſions to form, which will render the blindneſs incurable.

* The ſevere regimen, preſcribed by Celſus, and on which he lays a conſiderable ſtreſs, ſeems to be as unneceſſary as it muſt be irkſome to the patient—Antecurationem autem modicum cibo uti, bibere aquam triduo debet, pridie, ab omnibus abſtinere. Poſt hæc opus eſt quiete, abſtinentia, lenium medicamentorum inunctionibus, cibo (qui poſtero die ſatis mature datur) primum

But, though the ſtricteſt attention ſhould be given to every one of the above rules, both in performing the operation of couching, and in the treatment of the patient afterwards; long experience proves, that it is far from affording that proſpect of ſucceſs, which will warrant any certain dependance upon it. This will appear from the following remarks, made by thoſe writers on the ſubject, who, having deſcribed the operation with accuracy, may reaſonably be ſuppoſed to have been moſt ſkilful in the practice of it.

In the year 1716, which was almoſt as ſoon as the true nature of the cataract was known to any degree of certainty; though the operation of couching for it had been practiſed time immemorial; in that year,

primum liquido, ne maxillæ laborent; deinde inflammatione finita, tali qualis in vulneribus propoſitus. Quibus ut aqua quoque diutius bibatur, neceſſario accedit. Celſ. Id. pag. 433, 434.

Hovius,

Hovius, in his Tractatus De Circulari Humorum Motu in Oculis, inveighs ſeverely againſt it *. Profeſſor Raw, as we are told by M. Heiſter, obſerved in his lectures, that he regarded it as one of the moſt uncertain in all ſurgery; and had met with ſo little ſucceſs from it, that, after repeated trials, he determined to uſe it no more †. It is alſo obſerved by Heiſter himſelf, that though this operation is eaſy to be performed, the ſucceſs of it is very precarious ‡. In his caſes, publiſhed fourteen years after his ſurgery, the ſame opinion of this operation is confirmed by a multitude of inſtances, in which it failed. He there relates, that amongſt the great numbers couched by Taylor, Meinders, Hilmer, Cyrus, Eizenbert, and others, very few met with the deſired ſucceſs; and

* Hov. de Cir. pag. 121, 122.

† M. Heiſt. Med. Chi. & Anat. Obſervationes. Pag. 5, 6.

‡ Heiſter's Surgery. Part 2. ſect. 2. pag. 407.

more

more particularly, of thoſe operated upon by Taylor, with whoſe practice he was beſt acquainted. Of the vaſt numbers, couched by the operator laſt named, in the years 1750, 1751, and 1752, in the principal cities of Germany, not one in a hundred recovered their ſight. He further obſerves; that he ſaw, in ſeveral different places, many miſerable objects, in tormenting pain, ariſing from the inflammation conſequent upon the operation: and that of thoſe, who were reſtored to ſight, there was ſcarce one in ten, who did not ſooner or later loſe it again.

The failure, it muſt indeed be granted, was, in a great number of inſtances, no more than was to be expected, from the bad manner in which the operation was performed. Accordingly, the laſt cited author obſerves from Dr. Kaw, Phyſician to her Imperial Majeſty, where he ſpeaks of the rapidity of Hilmer and Taylor in performing it; that they not only left the

couched eye in a ſtate of great uneaſineſs; but that their patients ſeldom, if ever, recovered their ſight *. Much as was to be placed to the account of the operator, in theſe and many other inſtances; it was ſtill M. Heiſter's opinion, that there was a great uncertainty attending the operation itſelf. To this purpoſe, he largely inſiſts on its inefficacy, as proved by experience; and begins his obſervations with ſaying, "they were the reſult of "what had paſſed in Germany for the "ſpace of fifty years †."

Mr. S. Sharp, in his Treatiſe on the Operations of Surgery, publiſhed 1739, obſerves, that the troubleſome opthalmies, which ſometimes follow the operation of couching, together with the uncertainty of ſucceſs, which always

* Cancellariæ medicæ acta cum oculiſta Joſepho Hilmero, impreſſu ſumptibus directoris Petropoli. 1751.

† Med. Chir. & Anat. Obſervat. pag. 5.

attends it, have deterred moſt ſurgeons from undertaking it *.

Such, on the authority of the authors now referred to, being the hazard which attends couching; it is not to be wondered at, that the practice ſhould have been rather declined, than adopted, by the regular ſurgeons. They left it very much to thoſe empirical operators, who always ſeem moſt ready to engage in caſes, where there is the moſt difficulty; and in which men of better judgment have had the modeſty to forbear making any attempt. We are, perhaps, ſtill in ſome meaſure indebted to theſe leſs inſtructed, but bold practitioners, for preſerving from entire diſuſe, if not from oblivion, this and ſome other operations †, by the public exhibitions

* Sharp's Treat. on Oper. of Surgery. Chap. 23. pag. 155.

† Among the other operations here referred to, are to be principally diſtinguiſhed thoſe for the ſtone and the incarcerated hernia: which, with ſome others, are now carried to a very high degree of perfection.

made of them. For, to that it is very much to be attributed, that ſome of the faculty have occaſionally been led to operate in ſimilar caſes. And this, let me be allowed to ſay, they have done, from the juſt and laudable motive, that it was better for them to put their own reputation to ſome riſk; than wholly give up ſuch unhappy patients to the management of men, who, being unacquainted with the anatomical ſtructure of the parts, on which they undertook to operate, could not be expected to perform in ſuch a way, as would be moſt, if at all, likely to ſucceed. And, on that principle, the operation of couching has, of late years, been undertaken by the moſt able ſurgeons. Nor does the ſucceſs, which they have met with in it, by any means militate againſt the idea of the uncertainty attending it in general; which yet remains the ſame as ever.

Mr. Pott, in his excellent remarks upon the cataract, publiſhed 1775, cenſures the

the indiſcriminate rejection of this operation, in favour of extraction: though he acknowledges, the laſt may be right and uſeful in ſome particular inſtances *. But, if there is no true cataract, fit and proper for the operation of couching, which is not equally ſo for extraction—a point which I ſhall in the following pages endeavour to make apparent—the queſtion, then, to determine the practice is, which of the two is the moſt ſucceſsful. A general account has now been given of the former; from which it muſt, I think, be evident, that the effect of it has been ſo indeterminate, as could not but occaſion the beſt operators in that way, greatly to wiſh for an improvement, or even a total change, of the proceſs; though, for want of a better, ſo long uſed, in caſes of the cataract.

* Pott's Rem. on Cat. Pref. page 2.

SECT. VII.

On the Operation of Extraction.

There can be no doubt, that the firſt hint, which led to this operation, was, as is commonly ſuppoſed, ſuggeſted by the accidental eſcape of the opake cryſtalline, through the pupil into the anterior chamber of the aqueous humour. This might happen in or after the operation of couching, or from other cauſes. But however it was occaſioned, it is not to be doubted, that the cryſtalline has been extracted, after it was thus diſlodged. This is ſaid to have been frequently done by Woolhouſe, Taylor, and other itinerant oculiſts. M. Petit has given us a particular and authenticated inſtance of it, which was performed by him in the year 1707 †. M. St. Yves, as he has

† Mem. de l'Acad. Roy. des Sciences, Ann. 1708.

informed

informed us, was preſent at that operation; and further adds, that he performed it twice himſelf*. In theſe three laſt inſtances, it is to be depended on, that the experiment ſucceeded well. And it was probably the happy effect of it, in theſe caſes, which encouraged M. Mery in the ſame year, to recommend the practice of extraction in all other caſes of the cataract: as he might very reaſonably ſuppoſe, that the opake cryſtalline, which he had ſeen, in the inſtances referred to, to have been diſlodged from its ſeat by accident, might certainly be removed by the ſkill of the operator; and be brought away by extraction, as well in one caſe as the other. It does not however appear, that he had then practiſed this himſelf†.

Hovius, an author before mentioned, intimates, that he knew and practiſed

* M. St. Yves, Id. chap. xxi.

† Mem. de l'Acad. Roy. &c. 1707. pag. 500.

ſome one peculiar and effectual method of curing the cataract; but whether by extraction or in any other way, he has not thought proper to inform us *. M. Heiſter, who took the pains to make enquiries concerning that matter, ſays, he never could find one inſtance, of Hovius's ſucceſs, though he made ſo great a boaſt of it †; ſo that if he really did know a method of operating preferable to others, it remained a ſecret with himſelf: and nothing further was made public on the ſubject, till it was revived by M. Daviel at Paris, in the year 1745.

The able ſurgeon, laſt named, after many fruitleſs attempts, to render the operation of couching more ſucceſsful, re-

* Qua cataracta, ſive mollis, ac fluida, ſive debitam habet conſiſtentiam, ſive antiquata et tenax, omni tempore, ſecure, immune, tuto, abſque ullo viſus incommodo, aut imminenti periculo, tolli queat. Hovius de circulari, &c. pag. 122.

† Heiſter's Surgery, part 2. ſect. 2. page 206.

linquiſhed

linquiſhed it entirely: adopting, in the place of it, the removal of the opake ſubſtance altogether out of the eye, by extraction; which, he was then perſuaded, was to be done with the moſt perfect ſafety.

In the year 1752, he ſays, he had performed this operation on two hundred and ſix eyes: of which number, one hundred and eighty-two were reſtored to ſight; but to what degree, or what accidents accompanied or followed the performance of it, he has not told us *. It was however admitted on all ſides, that, in point of ſucceſs, he had greatly the advantage of them, who practiſed the old method of couching; which, from that period, began to decline in reputation.

* Une nouvelle methode de guerir la cataracte par l' extraction du cryſtallin. Par M. Daviel. Mem. de l'Acad. Roy. de Chir. Tom. ſecond. pag. 337. Plat. xix, & xx.

The

The manner, in which M. Daviel performed the operation, was as follows—He firſt pierced the cornea at its lower margin, with a ſharp edged and pointed inſtrument, in ſhape ſomething like a lancet: he then enlarged the aperture with another inſtrument, that had a blunt point, but ſharp edges; after which, he introduced a ſmall curved ſciſſars, to enlarge it ſtill further at each extremity, till it included two thirds of the circumference of the cornea: but this, he ſays, was not done without two ſciſſars; one of which was curved to the right, the other to the left. When the inciſion was compleated, he raiſed the ſeparated portion of the cornea, with a ſmall inſtrument, which he calls a ſpathula; and then introduced under it a pointed needle, ſimilar to what is uſed in couching, in order to wound the capſula of the cryſtalline—this being done, he made a preſſure with one of his fingers upon the globe, juſt below the wound in the cornea;

nea; by which the cataract was expelled, through the wounded capſula and cornea, upon the cheek. To facilitate this part of the operation; he ſometimes uſed the convex extremity of a little ſcoop, which he calls a curette; the reverſe or concave of which ſerved to extract any fragments that might remain behind. He alſo had in readineſs a ſmall pair of pincers; to remove ſuch portions of the cataract, as had formed adheſions, which could not be ſeparated by the curette. Such was the manner in which M. Daviel performed the operation—After this, the patient was immediately put to bed, kept wholly from light, and as ſtill as poſſible, and tied down to the ſtricteſt regimen. An eye water was often applied to the eye; but, if it was inflamed, a fomentation was ſometimes uſed, and the patient occaſionally let blood*. The French academy, ſolicitous to know the truth with reſpect to M. Daviel's ſucceſs, applied to M.

* Mem. de l'Acad. Roy. du Chir. Tom. 2. pag. 337.

Caque,

Caque, one of their members, who reſided at Rheims. This gentleman, by a letter dated January 25th, 1753, informed them, that M. Daviel had there operated upon thirty-four caſes: ſeventeen of which were perfectly reſtored to ſight; eight ſaw indifferently, and nine received no benefit. Of thoſe, which ſaw indifferently, ſix loſt the uſe of the pupil; and two had ſtaphilomas, which diſapeared by little and little*. The ſucceſs of M. Daviel, as above related from M. Caque, and fully authenticated by him, was, at that time, allowed on all hands to be very conſiderable. But the number of inſtruments, which he uſed, made the operation appear tedious and complicated. This put ſeveral of the members of the academy, and ſome others of the faculty, on conſidering how they might leſſen the apparatus, without impairing the utility of the operation. M. Garengeot aſſured the academy, that he had operated upon the

* Mem. de l'Acad. Roy. du Chir. Tom. 2.

eye

eye of a ſoldier with ſucceſs, and had uſed only a lancet, ſciſſars, and a curette, to diſlodge the cryſtalline. After this, M. Palucci propoſed to make the inciſion through the cornea with one inſtrument or knife; of which M. de la Faye gave a drawing to the academy *.

About the ſame time, M. Poyet propoſed to paſs a thread through the cornea, by means of a cutting needle or narrow knife, perforated near its point. This thread, being diſengaged from the hole or eye through which it paſſed, he made uſe of it to fix the cornea, during its ſection; as alſo, to ſuſpend its divided flap, at the time of puncturing the capſula of the cryſtalline; preferring it, for this laſt

* Mem. de l'Acad. Roy. Chir. Tom. 2. plat xx. This knife was a little bent near its point, on its flat ſide; which he thought would prevent its wounding the iris, in its paſſage to the other ſide of the cornea. By this conſtruction, a diſtinct knife, bent the contrary way, was required for the other eye.

purpoſe,

purpoſe, to the ſpathula of M. Daviel *. Nor were the French ſurgeons the only ones, who endeavoured to improve on M. Daviel's plan.

In a paper read at the Royal Society in London, April 12, 1753, and publiſhed in the forty-eighth volume of the Philoſophical Tranſactions †; Mr. S. Sharp propoſed to perform the whole operation with one inſtrument only. This was a ſmall knife ſomewhat curved, that is, a little convex on its back, and concave on its edge. By entering its point near the outward margin of the cornea, in the leſſer angle of the eye, and bringing it out at the oppoſite ſide of the cornea, in the greater angle, he made a tranverſe punc-

* Mem. de l'Acad. Chir. Tom. 2. Plat. xii. Fig. x. Remarques ſur la Memoire de M. Daviel, pag. 352.

† Philoſ. Tranſact. vol. 48. pag. 161. From the date of this paper, compared with thoſe of the French Academy, it appears, that Mr. Sharp was prior to M. Garengeot, or any other of the French Surgeons, in his eſſays for improving M. Daviel's mode of operating.

ture

ture through it; and then, by paſſing the edge of the knife downwards, a ſemi-ſection of the cornea was effected, as near as poſſible to the boundary of its union to the ſclerotica—this done, he preſſed the inferior part of the globe of the eye with his thumb or finger; which expelled the cataract, and finiſhed the whole operation. Mr. Sharp concludes his paper with obſerving—that, in this method of punctuation, the wound in the cornea is exactly filled up with the blade of the knife; and as that increaſes all the way to the handle, very little of the aqueous humour is diſcharged, before the inciſion downward begins: and, of conſequence, during this time, the cornea preſerves its convexity. On the other hand, by uſing one inſtrument to puncture that membrane, and others to dilate it, as M. Daviel did; and thereby letting out the aqueous humour at the beginning of the proceſs, ſo that the cornea and iris come nearly into contact; the ſubſequent part, or com-

pleat

pleat ſection of the cornea is rendered exceedingly difficult, if not impoſſible, to be executed without wounding the iris—

In June 1753, Meſſrs De la Faye, Poyet, and Morand, operated, the ſame day, upon nineteen cataracts: the two former by extraction, though in their different ways; but M. Morand, by depreſſion, or the old mode of couching. M. De la Faye operated upon ſix cataracts, by making an inciſion of the cornea with a knife only; and perforating the capſula with an inſtrument of his own invention, called Kiſtitome. During the inciſion of the cornea, he fixed the eye, by applying his middle finger on the globe, near the inner or greater angle. It is to be obſerved, that he made no pauſe between the punctuation, and inciſion of the cornea; but compleated its ſection at one ſtroke: ſo that, in four out of the ſix, the cataract was diſlodged from its

foſſula, and expelled upon the cheek, almoſt at the ſame inſtant.

M. Poyet operated on ſeven cataracts. In the firſt caſe, he pierced the cornea with his needle-knife, and having diſengaged it from the thread; he finiſhed the inciſion with its cutting edge. But he found this proceſs both ſo embarraſſing and painful, that he determined never more to uſe it; and accordingly, in the remaining caſes, he operated with M. Sharp's knife only, and exactly followed his method.

M. Morand operated upon ſix cataracts, by the old method of couching.

The ſucceſs attending theſe ſeveral operations was as follows. Of thoſe operated upon by M. De la Faye, two ſaw well, two indifferently, and two received no benefit at all. Two of M. Poyet's caſes ſaw well, two leſs, one could only

diſcover day-light, and two nothing. Three of M. Morand's patients could ſee tolerably well, and three remained as dark as before.

Mr. Sharp, in a ſecond paper on this ſubject, read at the Royal Society November 22, 1753, gives an account of his having then performed on nineteen eyes: with about half of which, he had what he thought tolerable ſucceſs; though, he grants, not a ſingle one eſcaped a conſiderable degree of inflammation. In ſome, he obſerved, the pupil loſt its circular form: which he attributed to the tenderneſs of the iris; rendering it eaſily ſuſceptible of a rupture, by the rapid paſſage of the cataract through it, or by any ſlight preſſure, which it might receive from the back of the knife in the operation. But whatever the cauſe might be, the rupture itſelf was not deemed by him at all prejudicial to the ſight. As an improvement upon his firſt plan, he then pro-

propoſed, inſtead of preſſing the eye with his thumb or finger, to ſtrike the point of his knife into the body of the cryſtalline; and thus, inſtead of expelling the cryſtalline, to take it out on the point of the knife, together with the capſula, in which it lay ſtill incloſed. In this way, he thought to remove the danger of evacuating the vitreous humour; which was too apt to follow the cataract, in a greater or leſſer quantity, when the eye was forcibly preſſed. He obſerves, however, that, contrary to his expectations, he had ſeen quantities of the vitreous humour diſcharged, without any bad conſequences. Mr. Sharp, ſenſible of the great difficulty, and almoſt impoſſibility, of the patient's keeping his eye ſtill, during the ſemiſection of the cornea; thought it merited conſideration, whether a ſpeculum would not be an uſeful appendage to this operation. But he then adds, it muſt be ſo conſtructed, or ſo applied, as not to compreſs the globe of the eye; or, if it

ſhould, care muſt be taken to remove it, as ſoon as ever, if not even before, the inciſion of the cornea is compleated: for, if it is continued the leaſt time afterwards, all the contents of the eye might be expelled by it.

Mr. Warner, in his deſcription of the human eye and its diſeaſes *, recommends the uſe of a knife with a ſtrait edge. He directs, that the point of it be ſuddenly and reſolutely introduced through the external part of the cornea, oppoſite to the center of the pupil; and to be thus continued horizontally, till it penetrates through the oppoſite ſide of the cornea: the inferior part is then to be ſuddenly divided, by carrying the blade of the knife downward and outwards. If the inciſion, thus made, proves too ſmall for the cataract to paſs through it; he then directs, that it be enlarged, by a pair of ſmall curved ſciſſars. After giving the eye reſt for a few minutes; he introdu-

* Warner on the diſeaſes of the eye, page 102.

ces,

ces, under the flap of the cornea, a concealed lancet, ſimilar to the Kiſtitome of M. De la Faye, to wound the capſula, that contains the cataract: though this latter part of the operation was thought unneceſſary by Mr. Sharp, and therefore omitted in his practice—Mr. Warner obſerves, that the diſcharge of the cataract ſometimes happens immediately upon the inciſion of the cornea, without any external preſſure; merely from the ſudden and involuntary contraction of the four ſtrait muſcles of the globe, drawing the eye inwards, and forcibly compreſſing it on every ſide. This operation, he would have it remembered, is not to be undertaken in thoſe ſubjects who were born with cataracts; unleſs their eyes, which are naturally always in motion, can be kept fixed and ſteady with the fingers, or with a properly conſtructed inſtrument, ſo contrived as not to preſs rudely on the eye. But as this preſſure cannot be avoided, when the common

ſpeculum oculi is uſed for that purpoſe; he therefore juſtly diſapproves of that inſtrument in this operation.

In M. Richter's Faſciculi, publiſhed in the year 1770, there is a ſmall, but excellent, diſſertation on the cataract; for the extraction of which, in preference to couching, he is a ſtrenuous advocate. He recommends two knives of different lengths, but of the ſame breadth: the longer, which was more ſpearpointed than the other, is deſigned for large and full eyes; and the ſhorter, which he called Berenger's knife, for eyes, either leſs in themſelves, or which lie deeper in the orbit. He began his puncture of the cornea exactly in a line with the center of the pupil; but paſſed the knife ſo rapidly, that both the puncture and the ſection of it were finiſhed nearly in the ſame inſtant. In the general, he employed no inſtrument to fix the eye; but uſed his fingers only, and them very gently, for the purpoſe.

When,

When, in ſome difficult caſes, an inſtrument became neceſſary, he made uſe of one invented by Parmatus—It reſembled a common needle; except only, that it had a ſhoulder, or check, fixed about the diſtance of a tenth of an inch from the point; marking the proper depth, to which the needle was to penetrate the conjunctiva, and to prevent it being carried any further—This inſtrument was to be inſerted into the conjunctiva, a little above and on the inſide of the cornea; and, having this hold, was to keep the eye in a fixed ſtate, till the knife had pierced quite thorough both ſides of the cornea; when the fixing needle might be taken out. He remarks, that this inſtrument fully anſwered the purpoſe propoſed by it; and that, though it might ſometimes draw a little blood, or occaſion a ſuggilation; it ſeldom, if ever, brought on any degree of inflammation. He recommends the Kiſtitome of M. De la Faye, as the beſt of all contrivances, to

open a paſſage through the capſula for the diſcharge of the cryſtalline lens ; though in a ſubſequent chapter, he, like Mr. Sharp, adviſes to take away the capſula with the cataract. The preceding accounts of the riſe and progreſs of the operation for extracting the cataract, include, as far as I know, every thing of importance that has hitherto been publiſhed on the ſubject. And, on the whole, it appears, from the different attempts made to improve upon M. Daviel's method, that the operation was not carried by him to a degree of perfection, which was generally ſatisfactory.

The firſt object, which the gentlemen, who differed from him, ſeem to have had in view, was, to accompliſh with one inſtrument, and with more ſpeed, an inciſion of the cornea, which ſhould be equal in ſize, and in all reſpects as ſimilar as poſſible, to that effected by M. Daviel,

viel, with ſeveral inſtruments, and in a ſlow and tedious proceſs.

They pierced the cornea tranſverſly, and cut it thence downwards; inſtead of from below upwards, as was M. Daviel's practice.

This deviation from M. Daviel's mode had really much to recommend it; little as the ſucceſs was, with which the practice of it was firſt attended, in compariſon of what was to be expected, and what M. Daviel himſelf had met with. The failure of it, which was ſeen to take place in ſo many inſtances, was not owing to any thing in the nature of the operation itſelf; but partly to a defect in the inſtrument made uſe of, and partly to an error in the manner of uſing it, as will be ſeen hereafter. And yet theſe practitioners, with all their defects, which rendered them leſs ſucceſsful than M. Daviel, were rather more ſo than M. Morand,

rand, one of the moſt diſtinguiſhed operators, by the old method of couching.

It cannot be in the leaſt ſurprizing, that ſo conſiderable an operation, as that of extracting the cataract, was not brought to perfection by the firſt or more early practitioners in it; though many of them were confeſſedly men of very diſtinguiſhed abilities in the line of their profeſſion.

M. Daviel and others, however, having favoured the world with the communication of the diſcoveries, ſeverally made by them, reſpecting the whole of the proceſs and its effects, have furniſhed thoſe, who follow them, with no ſmall advantages for proſecuting the ſame deſign. Their ſucceſſors may ſee their errors and avoid them; their defects, and ſupply them; and even improve upon thoſe particulars, in which they excelled. I, as well as ſome others, have endeavoured to avail

myſelf

myſelf of theſe helps; and, after innumerable experiments upon the dead eyes of animals, have for many years, performed the operation upon the living eye with ſucceſs.

The number of inſtruments, uſed by M. Daviel, has been reduced. A better method of fixing the eye, than was before known, is aſcertained; and the tranſverſe puncture, and inciſion of the cornea, found to be practicable, with the moſt perfect ſafety.

The method, now to be deſcribed, ſtands recommended, not merely by my own experience; but alſo by that of ſome others, who have practiſed it in this country, in the courſe of the laſt twenty years.

Still, the operation, though ſo practicable in itſelf, and beneficial in its effects, hath as yet been confined to a

few

few hands: owing, in part, to the impoſſibility of ſeeing it frequently performed; but ſtill more, to the want of a clear and circumſtantial deſcription of it. For, by the aſſiſtance of the latter, I cannot heſitate to pronounce, that the operation may be ſo perfectly underſtood, as to be even ſucceſsfully practiſed by thoſe, who have never before ſeen it performed by others: eſpecially, if they, at the ſame time, pay a proper attention to what is recommended at the end of the anatomical account of the eye. Should the few, who practice this method, all agree in freely admitting others to attend them; it would not be poſſible for more than one, or two at moſt, to come ſo near, as to ſee diſtinctly, and enter fully, into the ſmall niceties of the operation, on which the ſucceſs of it very much depends. At leaſt, they could not be ſuppoſed to acquire, in this way, any competent knowledge of the buſineſs; without ſuch an

explanation by the operator, as he would not then have leiſure to give.

Fully perſuaded myſelf of the great utility of the operation, and thinking a plain and practical deſcription of it to be ſtill much wanted, notwithſtanding what has hitherto been written on the ſubject, I have, for ſome time, employed my thoughts this way. The reſult will be given in the remaining part of this publication; the main view of which is, to facilitate, and by that means render more general, a mode of operation, proved by experience, beyond a doubt, to be the ſafeſt and moſt effectual.

I propoſe, firſt, to give a plain and ſimple account of the operation—And then to point the attention of the reader to various particulars in the proceſs; the want of a proper regard to which, has, I apprehend, been a principal cauſe of the inſtances of ill ſucceſs which have occurred

red in the practice of it—The latter part of the design will be comprized in distinct, but connected, remarks; which will be annexed to the description, with references, by letters, to those parts of it, to which they relate.

SECT. VIII.

The Operation of Extraction described.

The room, in which the operation is to be performed, should have a clear light; without admitting the direct rays of the sun[a]. The patient is to be seated in a low chair; with his head reclined on a pillow, and held by an assistant, in such a position, that the eye to be operated on may be nearer to the light, than the other[b]. The operator must be seated a little higher than the patient, directly before and as near as possible to him; even upon his knees, if he be much taller

than himſelf. Thus moſt conveniently ſituated for operating, he is then to place the fore and middle finger of his left hand upon the tunica conjunctiva, juſt below, and a little on the inſide of, the cornea[c]. At the ſame time, the aſſiſtant, who ſupports the head, muſt apply one, or if the eye projects ſufficiently, two, of his fingers, upon the conjunctiva; ſomewhat on the outſide of, and above, the cornea. The fingers of the operator and aſſiſtant, thus oppoſed to each other, will make an oblique counter preſſure upon the globe; ſo as to fix the eye, and prevent the lids from cloſing[d]. The point of the knife, which is to be held in the right hand—as the eye here ſuppoſed to be operated on is the left—is to enter the cornea on the ſide next the leſſer angle of the eye, about one tenth of an inch above its tranſverſe diameter, and a little anterior to its connection with the ſclerotica. The knife, thus introduced, is to be puſhed on, ſlowly but ſteadily, without

out the leaſt intermiſſion, in a ſtrait direction, with its blade parallel to the iris; ſo as to pierce the cornea towards the inner angle of the eye, on the ſide oppoſite to that which it firſt entered, till one third part of it is ſeen to emerge beyond the inner margin of the cornea, and the point of the knife approaches the commiſſure of the eye-lids, in the greater angle of the eye. When the knife has reached ſo far, the punctuation, or that part of the operation, which is preparatory to the ſection of the cornea, is compleated. The broadeſt part of the blade is now between the cornea and iris; and its cutting edge below the pupil, which, of conſequence, is out of all danger of being wounded by it. At this time, as every degree of preſſure muſt be taken off the globe of the eye; the fingers both of the operator and his aſſiſtant are to be inſtantly removed from that part, and ſhifted to the eye-lids. Theſe are to be kept

aſunder,

aſunder, by preſſing them gently againſt the edges of the orbit: and the eye itſelf is to be left entirely to the guidance of the knife; by which it may be raiſed, depreſſed, or drawn on either ſide, as ſhall be found neceſſary. The aqueous humour being now partly, if not entirely, evacuated, and the cornea, of courſe, rendered flaccid; the edge of the blade is to be preſſed ſlowly downward, till it has cut its way out, and ſeparated a little more than half of the cornea from the ſclerotica; following the ſemicircular direction, marked out by the attachment of the one to the other. This compleats the ſection of the cornea; which is the ſecond part of the proceſs.[e] The inciſion being finiſhed, the eye-lids are to be ſhut; as it is deſirable that the eye ſhould then have reſt for a few minutes. If both eyes are to be operated on; then is the time for the cornea of the right eye to be divided, in the ſame manner as that of the left had been before: the

knife being of neceſſity changed to the left hand *.

The cornea of both eyes being divided; the lids of the firſt eye are again to be opened, and kept ſeparate, without the ſmalleſt preſſure upon the eye itſelf. It will now be found, that the eye, which, before and during the inciſion, could not without difficulty, be kept from motion, becomes more quiet and paſſive. This gives a favourable opportunity for the uſe of M. De la Faye's Kiſtitome. [f] The blunt extremity of the canula is to be introduced under the flap of the divided cornea; and carried through the center of the pupil, till it comes in cloſe contact with the capſula of the opake

* Some years ago, a Mr. Miller, of Edinburgh, conſtructed a knife, the haft of which ſtood at right angles with the blade, which was very ſhort. This, being held in the right hand, was to be introduced into the inner, inſtead of the outer, margin of the cornea of the right eye. But I have never ſeen it uſed.

cryſ-

cryſtalline; when it muſt be elevated to ſuch a height, that the point of its concealed lancet, being puſhed forwards by the thumb, a tranſverſe ſlit may be made in that membrane, parallel to the tranſverſe diameter of the pupil.

The Kiſtitome is now to be withdrawn; and when both capſulæ have been punctured, they may be permitted to reſt a little. The firſt eye is then to be opened, but with the ſame caution as before; and a gentle preſſure is to be made upon it, by applying the blunt and convex extremity of the curette upon the conjunctiva, juſt below the wound of the cornea. By this means, if the cataract has formed no adheſions, and the apertures made in the capſula and cornea, are ſufficiently large; the cataract will gradually riſe out of its capſula, and paſs through the pupil into the anterior chamber of the aqueous humour; from which its own weight will bear it down,

through the wound of the cornea, and leave it upon the cheek. [g]

If any groſs particles of the cataract, or of the nigrum pigmentum, remain in either of the chambers of the aqueous humour; or between the lips of the wound in the cornea; or, between the globe and lower eye-lid; they muſt be taken away by the ſcoop or concave end of the curette: which may, if neceſſary, be repeatedly introduced, without danger, till the whole is extracted. If, again, during the operation, any portion of the iris be diſturbed, or diſplaced; ſo as that it loſes its figure, or has inſinuated itſelf into the wound of the cornea; it muſt alſo be reſtored by the ſame inſtrument. This being accompliſhed in each eye, the flap of the cornea is to be ſmoothed, and the edges of the wound exactly adjuſted to each other, by the convex extremity of the curette; and by gently rubbing the end of the finger

over

over the upper eye-lid when ſhut. The window-ſhutters ſhould now be cloſed in part, or the curtains drawn; but if both theſe be wanting, the patient may be turned from the light; and having continued in that ſituation, with his eyes ſhut, for ſome little time, may then be permitted to open them again. This will be a good teſt of the ſucceſs of the operation: for if it has anſwered its end, the patient will, with tranſport, immediately proclaim the return of his ſight.

Laſtly, the eye-lids being again cloſed, and in the manner juſt deſcribed, a plaiſter of ſome ſimple cerate, ſpread upon lint, is then to be laid over them; which is to be covered with thin bolſters, made of ſome fine old linen; and the whole to be faſtened by a cloth, pinned round the head; ſo as to lie upon the eye, but not in the leaſt to compreſs it.[h]

The buſineſs of the eye being finiſhed, the patient is then to be conveyed to bed; where he is to be laid upon his back, with the head nearly as low as the reſt of his body. The pledgit is to be taken off once a day; when the eye-lids are to be gently waſhed with a little cold water, which is always agreeable to the patient; and then dried with a ſoft cloth, and freſh dreſſings to be applied as before.

The pure aqueous humour is generally ſeen to flow plentifully for the firſt two or three days; and as this flux leſſens, the diſcharge from the eye becomes thicker; and conſtantly increaſes in tenacity, as it diminiſhes in its quantity. This appearance may continue for the ſpace of ſix, eight, or even twelve days. So uncertain is the period of its final termination; but it always gradually decreaſes, more or leſs.

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Whenever this diſcharge wholly ceaſes, whether in a ſhorter or longer time after the operation, the eye may be inſpected: at which time, ſhould nothing more be perceived, than a thickneſs of the edges of the wound in the cornea, and that they are in contact; it may with good reaſon be concluded, that all is right. A variation of the poſture may now be allowed; ſuch as, ſitting up in bed or in a chair. In a week more, the plaiſter may be omitted, and a ſhade ſubſtituted in its ſtead; when the eye is to be frequently waſhed with ſome cooling water; and ſo much light may be admitted, as can be borne without uneaſineſs.

If, which but rarely happens, an inflammation ſhould come upon the eye, during the proceſs of cure; the ſame means are to be uſed, as in other caſes of this kind, where there has been no operation *: ex-

* See a Treatiſe upon the Opthalmy, &c. by J. Ware.

cepting only, that the Tinctura Thebaica and all ſtimulating applications are to be avoided, till the wound in the cornea is firmly conſolidated.

Remarks, Explanatory and Cautionary, on the Operation of Extraction.

'Light, which is uſeful in every ſurgical operation, is peculiarly ſo in this: not only on account of the ſmallneſs of its ſubject; but alſo, becauſe the contraction of the pupil is always in proportion to the degree of light, to which it is expoſed. By this contraction of the pupil, the iris approaches nearer to the cryſtalline; and diminiſhes the poſterior, while it enlarges the anterior chamber of the aqueous humour: by which, a larger ſpace is allowed for paſſing the knife between the cornea and itſelf; ſo that the latter is leſs liable to be wounded, in the punctuation and ſection of the cornea, than

than it would otherwiſe be. The direct rays of the ſun are objected to, on account of their uncertainty; as an intervening cloud would offend the eye of the patient and operator, and prove not a little inconvenient to both.

[b] The obliquity of the patient's poſition affords the operator a more diſtinct view of the eye: for, when that is in a direct oppoſition to his own, the ſhining glare of the cornea will prevent his ſeeing clearly into it.

[c] I have purpoſely omitted many particulars, reſpecting the poſture of the ſurgeon, and the manner of holding his inſtruments, with other minute circumſtances: becauſe the mention of them muſt be needleſs to thoſe perſons, who at all ſtudy the ſubject; and it is not to be ſuppoſed that any other will engage in the operation.

'That the upper part of the globe ſhould be held by an experienced aſſiſtant, is certainly very deſirable; and ſhould invariably be practiſed, if the eye projects ſufficiently to allow it. When it does not, the aſſiſtant's care muſt be confined to the upper eye-lid; while the globe, which he ſhould by no means touch, may be effectually held by the fingers of the operator, when placed as directed. The preſervation of the eye in a fixed ſtate, during the punctuation and ſection of the cornea, muſt certainly be of the greateſt conſequence; and the uſe of ſome external aid for the purpoſe cannot but be abſolutely neceſſary: for, let the reſolution of the patient be ever ſo diſtinguiſhed, it is next to impoſſible for him, while the knife is piercing the cornea, to hold the eye perfectly ſtill himſelf. How to effect this by other means, has, we find, through the hiſtory of the operation, been found a matter of no ſmall difficulty. Some of them, who

firſt performed it, were fearful of uſing any force; while others applied it very improperly. But we ſhall beſt learn, both their modes of practice, and the effects which attended them, from their own accounts. To them, ſo far as they reſpect the particular point of which I am ſpeaking, I would now turn the attention of the reader.

M. Daviel took no meaſures to fix the eye: nor was it, indeed, ſo neceſſary in the mode he practiſed. For, when his inſtrument, or lancet, was introduced through the lower margin of the cornea; that alone was ſufficient to keep the eye from moving downwards or to either ſide; and the motion of the eye upwards could not prevent the execution of that firſt part of his proceſs; though it might have been better executed with it. M. Poyet was very ſenſible of the great utility of fixing the eye, in order to divide the cornea tranſverſely, which was his mode;

and accordingly paſſed a thread through the cornea, for the purpoſe. But this he found, upon the firſt experiment, to be ſo painful to the patient, and withal ſo embarraſſing; that he relinquiſhed it entirely. From that time, he truſted wholly to the ſteadineſs and reſolution of the patient.

M. de la Faye and Mr. Richter, to fix the eye, applied the middle finger upon the inner and inferior part of the globe. But, as the preſſure made in this way was reſtrained and limited by no particular rules; their patients were ſubject to the ſudden expulſion of the cataract; and, with it, of a great part of the vitreous humour.

Mr. Sharp, as we have ſeen, uſed no means whatever for fixing the eye; but depended entirely on the reſolution of the patient. The difficulty attending the inciſion of the cornea was often found by him

to be ſo great, as led him to think that a ſpeculum oculi might be introduced with advantage in this part of the operation; though he never made tryal of it himſelf.

In M. Richter's mode of applying the end of one of his fingers to the globe, the preſſure was too ſlight to anſwer the end. He therefore had recourſe to an inſtrument invented by M. Parmatus for that purpoſe.

Mr. Warner ſtrongly cautions againſt preſſing the globe; eſpecially, at the time the eye-lids are kept aſunder. He obſerves, that this operation cannot be properly performed on perſons, who have not the power of keeping their eyes from rolling about; and, of conſequence, that perſons born with cataracts cannot be fit ſubjects of it; becauſe their eyes, as was before obſerved, are naturally always in motion. This gentleman was fully convinced

vinced of the dangerous conſequences of too much preſſure; and therefore did not uſe any. But, at the ſame time, he was no leſs apprized, than others of the faculty, of the great importance of ſteadineſs in the eye, during the operation; could any means be deviſed to ſecure it, without preſſing too much on this tender part.

About ſeventeen years ago, M. Chalibert, a French Oculiſt, put into practice, what, as I ſaid before, Mr. Sharp had hinted in theory. This was, the introduction of a new invented ſpeculum in this buſineſs. It was made of ſtrong wire, which was covered with velvet; and bent, for the purpoſe of adapting itſelf, when introduced under the eyelids, to the greater part of the fold of the conjunctiva. The handle of the inſtrument was held upon the cheek by the operator: ſerving to keep down the lower eye-lid, while the upper lid was ſuſpend-

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ed by his aſſiſtant. I ſaw M. Chalibert himſelf make uſe of this ſpeculum in three different caſes. He found ſome difficulty in placing it properly under the lids. It did not keep the globe ſteady, and could not be retracted, without no ſmall danger as well as pain to the eye. Notwithſtanding this, the operation had the appearance of ſucceſs in all the three caſes: which I then attributed more to his ſkill in operating, than to any great help he received from the ſpeculum. The late M. Elſe, being clearly of opinion with me, as was indeed made incontrovertible by fact and experience, that this important buſineſs of fixing the eye was not hitherto provided for, by any of the operators before-mentioned; we both of us, ſeparately, exerted our beſt endeavours, to ſupply the defect, by inſtruments of different conſtruction. But, after repeated trials, had the mortification to find, that all our labours were fruitleſs; and were left fully convinced,

vinced, that the eye could not be either ſo effectually or ſafely fixed by any inſtrument, as by the fingers alone.

As the deſign of all preſſure, by whatever means effected, is, to keep the eye ſtill, while the knife paſſes through the cornea; I ſhall now make a few remarks, which I deem very neceſſary and uſeful, in directing the right application of the fingers; ſo as to produce in the beſt manner the effect aimed at.

In experiments made to fix the eye, for different purpoſes, it has been found, that, if preſſure be made upon it, by ſlow degrees, from little to more, even till it becomes very conſiderable; and this preſſure is then removed in nearly the ſame gradual way; an eye, thus treated, receives very little temporary, and no laſting injury. If, on the contrary, the ſame degree of preſſure be applied, and taken off, ſud-

ſuddenly; the eye will always be hurt more or leſs, and in moſt caſes irremediably, by it.

It has alſo frequently been obſerved, that when the eye has received an accidental ſtroke from a finger, or in any other way; though the force acting on the eye was in itſelf inconſiderable, yet the velocity of its action has occaſioned a continued blindneſs; accompanied with one or more of the many irregular appearances, differently deſcribed by oculiſts.

And it is further obſervable, in the operation of extraction, that an eye under preſſure, when laid on in the gradual way, may, at the ſame time, be ſafely punctured to the extent required; provided the preſſure be inſtantly and cautiouſly removed, the moment the puncture is compleated: for, it will then receive no more harm

from the preſſure, while under the operation, than at any other time.

But it muſt always be remembered, that if this preſſure be continued only for a moment after the puncture is finiſhed, or till the inciſion of the cornea is begun, the whole contents of the globe will be deranged; and ſome of them, if the preſſure ſtill remains, will be apt to come away with the knife.

It is, again, to be obſerved, that in caſe of a ſudden and haſty cut or inciſion of the cornea; whether it be made with a deſign to extract a cataract, or for any other diſorder in the eye, or is occaſioned by an accident; effects ſimilar to thoſe laſt deſcribed, often enſue. But, in caſes of this kind, as in all others, preſſure, united with rapidity, will encreaſe every bad effect, and the evil will be in proportion to the degree of each of them.

'It is on the ground laid by the preceding obſervations, and ſimilar ones, that this part of the operation of extraction is divided into two diſtinct proceſſes, called, the punctuation, and the ſection of the cornea. We have now learned, that ſo long as the knife fills up the aperture, in which it is inſerted, the globe may be conſidered as entire, and the preſſure continued with ſafety; that is, till the knife has paſſed through both ſides of the cornea, and its extremity has advanced to the point deſcribed in the operation: at which time, this part of the proceſs, called the punctuation of the cornea, being finiſhed, the end and deſign of the preſſure is fully anſwered. It is alſo no leſs clear from what has been obſerved, that if the preſſure be continued till the ſecond part of the proceſs, or ſection of the cornea begins; inſtead of ſerving any good purpoſe, it will moſt certainly diſturb the parts within the eye; and, if continued till the ſection is compleated, will pro-

duce effects of the worſt kind, ſimilar to thoſe already mentioned.

In making the punctuation of the cornea, care ſhould be taken, on the one hand, not to paſs the knife ſo obliquely inwards, that its point may wound the iris; and, on the other, that it be not done ſo ſuperficially, as to inſinuate itſelf between the laminæ of the cornea, and ſo not make any aperture at all, or too ſmall a one, through it, into the anterior chamber of the aqueous humour. Either of theſe accidents may defeat the whole operation: but the latter is the leaſt dangerous of the two; for, the defect ariſing hence may in ſome inſtances be rectified, by enlarging the orifice with a pair of curved ſciſſars, or by a freſh punctuation.

I have above noticed the danger of too great rapidity in the punctuation of the cornea, and ſhall ſay more on that head hereafter.

hereafter. It is alſo deſerving attention, on the other hand, that the knife may be paſſed too ſlowly; and that this contrary extreme, as well as the former, will be very injurious. For, if, in the puncture of the cornea, there be the leaſt interruption or ſtop in the progreſs of the knife; the conſequence will be, that before it has penetrated through the cornea, if not even before the point has reached the other ſide of it, a great part, if not the whole, of the aqueous humour will have eſcaped. Hence, alſo, this further conſequence will follow, that the cornea, iris, and knife, muſt of neceſſity come into immediate contact; ſo that the point or edge of the knife will, it is moſt likely, be entangled with the iris; under which circumſtance, it will be next to impoſſible to finiſh the punctuation, much leſs the ſection, of the cornea, without wounding the iris. Whenever this unfortunate incident occurs; the beſt way is, immediately on the diſcovery

of it, to withdraw the knife, before it has done any miſchief; and to relinquiſh the operation entirely for that time: waiting ſome favourable opportunity in future, when it may be performed with better ſucceſs.

As ſoon as the punctuation of the cornea is finiſhed, and, of courſe, a ſtop put to the further progreſs of the knife; the aqueous humour is immediately evacuated, as was before noticed. Nor is this fluid, which was ſo lately of the greateſt importance, any longer neceſſary; for, it has now anſwered the end of keeping the cornea and iris at a proper diſtance from each other, during the paſſage of the knife between them; beyond which, there is not the leaſt occaſion for it. The body or middle part of the knife will now be ſeen to lie between the cornea and the iris, and nearly in contact with both. Nor can the iris, any more than the cornea, be hereby in the leaſt endangered;

becauſe the lower edge of the knife, by which alone it could be ſuppoſed to be affected, is now ſituate between the lower portion of the iris, and the ſame portion of the cornea, with its blunted back towards the upper part of the iris. That portion of the lower margin of the cornea, which lies under the edge of the knife, yet remains to be divided from the ſclerotica. This will be beſt effected, not by directly preſſing the edge of the knife downwards; but by gently impelling and retracting it, alternately, from ſide to ſide; till it makes its way out gradually, and without a jerk, which is always dangerous in this operation.

As the puncture and ſection of the cornea are both performed by the ſame inſtrument or knife; this muſt of courſe require, that the knife ſhould conſiſt of different parts; and that each be adapted to the particular purpoſe, which it is deſigned to anſwer. And what the length,

breadth, and ſhape of the whole, and of each particular part, ſhould be; the form, ſize, and ſituation of the cornea, can alone determine.

The form of the cornea, as was before obſerved, is circular; and its diameter about half an inch. The ſubſtance of the cornea is of ſo tough and hard a nature, that it cannot be even punctured without violence; unleſs the inſtrument for this purpoſe be extremely fine and ſharp.

The cornea is placed nearly in the center between the outer and inner canthus, and upper and lower margin of the orbit; the diſtance of which parts from each other, though not always the ſame, is uſually about one inch and a half. This ſpace, being the area in which the knife is to move, muſt determine the length of the blade. The handle of the knife may be of the ſame dimenſions as

that of the couching needle, which is about the length of four inches. The blade muſt conſiſt of three diſtinct portions; becauſe it is to anſwer ſo many diſtinct purpoſes. The firſt part, which is to pierce the cornea, ſhould be made exceedingly thin, and fine pointed; with ſharp edges, like thoſe of a lancet. This part ſhould not be leſs than four, or more than five, eighths of an inch in length; and ſo conſtructed, as gradually to encreaſe in width and thickneſs from the point. When nearly the whole of this portion of the knife has paſſed through the interior ſide of the cornea, and appears between it and the greater angle of the eye; the ſecond or cutting portion will be ſeen, as before deſcribed, between the cornea and the iris. This part muſt be half an inch in length; to make it equal to the tranſverſe diameter of the cornea: and a quarter of an inch in breadth, to anſwer the ſemidiameter of the cornea; ſomewhat more than the width

of which is to be ſeparated by it. This portion muſt be a little thicker than the former, with a fine thin cutting edge; but blunt on its back, that it may not wound the iris, or any other part of the eye, which it may touch. The third and laſt part of the blade ſhould be three eighths of an inch in length; and of the ſame breadth, as the cutting part or body of the knife; blunted all the way, on the edge as well as the back part. It muſt alſo, like the two former portions, gradually increaſe in thickneſs towards the handle: its deſign being to act like a wedge, by blocking up the poſterior aperture in the cornea, and ſo prevent the premature eſcape of the aqueous humour. Theſe three portions of the blade meaſure, in the whole, one inch and a half in length; which, as was before obſerved, is the uſual diſtance between the outer and inner angles of the eye. In the two former portions, exactneſs in their dimenſions muſt be carefully preſerved;

ſerved; but the laſt may be a little increaſed or diminiſhed at pleaſure. It is to be particularly noticed here, in the conſtruction of the knife I have been deſcribing—that it gradually increaſes in thickneſs from the point to the handle; is nearly ſtraight in the back and edge; and without the leaſt incurvation on either of the ſides: for, by this conſtruction of the knife, it is rendered next to impoſſible, that any of the aqueous humour ſhould eſcape, before the ſection is begun to be made; and, conſequently, during this time, the cornea will preſerve its convexity. But if, on the contrary, the blade is ſo formed, as not to increaſe from the point; if it is incurvated much on its back, or edge; or if it is bent on its ſide, as the inſtrument uſed by M. de la Faye was; the unavoidable effect will be, that the aqueous humour will be ſpilt, even before the puncture is compleated; in which caſe, the ſection of the cornea cannot be performed with any

degree

degree of certainty. Some of the evils ariſing from an ill-timed or two violent a preſſure of the eye, as alſo from a rapid ſection of the cornea, have been already pointed out: and all theſe will be not a little augmented by the uſe of a miſhapen knife. I ſhall now add a few more to the catalogue of Ills, out of a multitude of others, which might be named, proceeding from the ſeveral cauſes juſt mentioned. By the premature eſcape of the aqueous humour, the iris will be very apt to fall under the edge of the knife; and, being wounded by it, to fill the aqueous chambers with blood, which, it hardly need be ſaid, cannot but very much obſtruct the operator's ſight.

In this caſe, beſides the inflammation, which is always conſiderable, the jagged filaments of the wounded iris will be liable to inſinuate themſelves into the inciſion of the cornea, and thus prevent the ſpeedy reunion of the divided parts: and

hence

hence a ſtaphiloma may at laſt enſue—an accident, which frequently happened in M. Daviel's method. Again—on the ſuppoſition, that the ſection of the cornea be executed too haſtily, the violence attending the inciſion will inſtantly produce a ſpaſm of all the muſcles of the eye: which, cauſing a forcible expulſion of the cryſtalline, &c. through the pupil, may ſo unduly dilate it, as muſt neceſſarily end in its future fixed contraction; by which the ſight will be entirely deſtroyed—The violent diſcharge of the cryſtalline, which, at one time, produced only a dilatation of the pupil, may, at another, beſides doing this, alſo occaſion a rupture or laceration of the iris. And, as the opening thereby made, if it be conſiderable, is ſeldom, if ever, ſeen to cloſe again; ſome degree of ſight will, of courſe, be reſtored to the patient: but, as the pupil will, at the ſame time, be rendered incapable of that alternate contraction and dilatation, which is eſſential to

perfect

perfect viſion; the ſight muſt, in ſuch inſtances, neceſſarily be imperfect.

As I have been ſpeaking ſo largely of the ſeveral requiſites to a ſafe and effectual punctuation and ſection of the cornea; I think it proper to conclude the above remarks with obſerving—that it is, in common, to ſay the leaſt, altogether as practicable to paſs a knife of the proper conſtruction through the cornea with a view to extraction, as to pierce the ſclerotica with the couching needle, for the purpoſe of depreſſing the cataract. The only caſe in which there can be any obſtruction to ſuch a proceſs, is that of the low ſeated eye, which it is therefore neceſſary, ſhould be here particularly noticed. It muſt here, then, be recollected, that the point of the couching needle is always entered into the ſclerotica; that is, further back in the eye than the knife in extraction: and hence it muſt, I think, be evident, that the elevated margin of the

the orbit is a greater impediment to couching, than it can poſſibly be to extraction, even in the caſe before us. It is, indeed, very uncommon for an eye to be ſo very low ſeated in the orbit, as not to admit of a compleat ſection by the knife; eſpecially, as it is by no means neceſſary that this ſhould always be done in the exact form laid down in the deſcription. Should, however, the outer edge of the orbit ſtand ſo high, as to render the inciſion of the cornea, in the preſcribed form, impracticable; in ſuch caſes, as the margin of the boney ſocket, is always lower in ſome one part than another, the punctuation may commence in that part, and the inciſion be carried on thence, to as large an extent, as in the regular way of conducting it: for, in reality, it is not material, whether the ſection of the cornea be made in the tranſverſe, or perpendicular direction; if it does but include at leaſt one half of its circle, and correſpond

with

with it. Still, I would not be underſtood to advance, that no eye can be ſeated ſo low in the orbit, as not to admit the operation of extraction: but only, that if any ſuch eye be capable of couching, it is more ſo of extraction; while yet ſome eyes, from the cauſe, to which I have now been adverting, may be unfit for either *.

'In order to effect the ſlit, in the capſula of the opake cryſtalline lens, M. Daviel ſuſpended the ſeparated flap of the cornea with a little inſtrument, called by him, ſpathula; and pierced the capſula with a common couching needle. M. de la Faye made uſe of a concealed lancet, to which he gave the name of the Kiſtitome. The point of this inſtrument, lying within a ſheath, poliſhed very ſmooth, and flat; may be introduced under the divided flap of the cornea, and carried through

* Oculus quoque curationi neque exiguus, neque concavus, ſatis opportunus eſt. Celſ. Id. lib. 7.

the

the pupil, till it comes into cloſe contact with the capſula, without any injury to the iris; and when the puncture of the capſula is compleated, may be retracted again with equal ſafety.

The late Mr. Elſe, and others, thought that this perforation of the capſula might be made, as well and as ſafely, by a common needle, or any other ſharp-pointed inſtrument, bent near its end, as by the Kiſtitome. But we learn, on the contrary, by operating both on the dead and living eye, that when a ſimple perforation only is made through the capſula of the cryſtalline; it will no more yield in that part to the impulſe of the lens, upon preſſure, than any other portion of that membrane, which is entire. A ſmall wound or inciſion, not leſs than one-eighth of an inch in length, is therefore abſolutely requiſite for this purpoſe: for, when the cryſtalline is made to riſe againſt ſuch a ſlit in the capſula, it will then eaſily admit of

laceration at each extremity, to a length ſufficient for the purpoſe of letting that humour through it. It is for this reaſon, that I have recommended the Kiſtitome of M. de la Faye, in preference to the needle of Mr. Elſe, &c. as a wound or inciſion of the capſula is to be effected with the greateſt certainty by the former. When the capſula is not unuſually tough, it may be punctured or wounded by the ſmall end of the curette; only taking care that it be made very thin and ſharp for the purpoſe: in which ſtate, that inſtrument recommends itſelf, as being at once both eaſier and ſafer to be uſed, than the Kiſtitome itſelf; while, in moſt caſes, it will be found fully to anſwer all the ſame purpoſes. As ſoon as the capſula is properly punctured; the operator will be made ſenſible of it, by his feeling a little jerk the moment the inſtrument has paſſed through it; and alſo, by the iſſue of a ſmall quantity of fluid, which is oftner turbid than clear. I ſuppoſe that the

fluid

fluid never fails to iſſue, though the quantity is ſometimes ſo ſmall as to elude obſervation.

This little wound or inciſion of the capſula ſhould be made, as exactly as poſſible, in that part of its ſurface, which anſwers to the center of the pupil: becauſe the cryſtalline lens is much thicker and firmer in the middle, than the circumference. If, inſtead of this, we ſuppoſe the perforation to be made laterally; the conſequence will be, that the inſtrument will very eaſily paſs through the ſoft ſides of the cryſtalline, and its capſula, into the vitreous humour: and when this happens, the preſſure of the curette, neceſſary to move the cataract forwards, will be ſufficient alſo to expel more or leſs of the vitreous humour—an accident, which though Mr. Sharp thought it to be of little conſequence, has, by repeated obſervations ſince made, been found to be productive of great miſchief. It is

always followed by a ſevere inflammation, and if the ſight is in any degree reſtored by the operation, it is however ſure to be defective. Beſides this, if the vitreous humour happens to be thinner than common, it will, in that caſe, iſſue inſtantly through the wound in the capſula, leaving the cryſtalline behind. The latter will alſo retire, and remain within the eye; in which ſtate, it can neither be extracted nor depreſſed; but muſt be followed at firſt with much inflammation, and at length with incurable blindneſs.

There is yet another reaſon why this inciſion in the capſula ſhould be parallel to the center of the pupil; and that is, becauſe the aperture, thus made, will never ſo entirely cloſe, but that even ſhould the whole capſula become opake, it will ſtill admit ſome rays of light to the bottom of the eye, and ſecure a certain degree of ſight. This obſervation is founded on what is ſeen to happen in operating

rating upon the dead eye. For, we find, that if the wound or ſlit in the capſula is made much above or below the middle of the pupil, the ſmaller portion of the capſula, in this divided ſtate, will retract itſelf behind the iris; and the larger will remain, like a curtain, in its natural ſituation. This effect would, however, be of little conſequence, did the capſula always retain its tranſparency: but as that membrane ſometimes becomes opake, after extraction, as well as couching, it is of conſiderable importance.

Both Mr. Sharp and M. Richter were of opinion, that, in couching, the cataract, when depoſited at the bottom of the eye, was ſtill enveloped in its capſula *. Mr. Sharp concluded that the cryſtalline, and its capſula, might alſo be both eaſily taken

* Ego vero puto, plurimiſque experimentis perſuaſus ſum hac operatione plerumque capſulam cum lente deprimi. Richt. Chirurg. Obſervat. Faſc. prim. de Catar. extrah. methodo novo, pag. 97.

away together, by extraction, without the uſe of preſſure, to which he was an enemy, on account of the many bad conſequences he had ſeen to attend it. On that ground, he thought it beſt to pierce the cryſtalline with a fine ſharp needle to its center or hardeſt part; in conſequence of which, he ſuppoſed that the cataract and its membrane, would both be brought out of the eye together, upon the point of the inſtrument. This mode of practice muſt have taken its riſe from the ideas which he entertained of the firm attachment of the capſula to the cryſtalline, and the ſlight connection of the former with the ſurrounding parts. But, in oppoſition to what he here too readily took for granted, the fact, proved by experience, is, that the human cryſtalline, both in its natural and cataractous ſtate, is generally ſeparated from its capſula by an aqueous medium; while the capſula cryſtallina itſelf is ſo firmly attached to that of the vitreous humour, and to the ciliary proceſſes,

ceſſes, that no ſeparation can take place, without lacerating one or more of theſe parts. This being the fact, and that fact the direct contrary to what he ſuppoſed, the practice, together with the theory, of courſe, falls to the ground. M. Richter, * ſuppoſing that the anterior portion of the capſula might contain ſome particles of the cataract, which, ſhould they remain, would probably prove an obſtruction to the ſight; † recommends the opening a paſſage for them, by ſeveral ſections of that part of the capſular membrane, with the Kiſtitome. But this method of treating the capſula is very exceptionable. Beſides the danger, to which the iris would be expoſed, by the repeated movements of a ſharp and pointed inſtrument within the ſmall ſphere of

* Richt. Chirurg. obſervat. Faſc. prim. de catar. extr. pag. 9.

† Monendum vero eſt non ſufficere illam pertundi, ſed requirere cito, repetitis ictibus penitus illa dilaceretur & deſtruatur. Id. c. 4. p. 37.

the pupil; the wounds made in the capſula could not but leave ſome jagged filaments behind them; which might become opake. And not only ſo; but thoſe filaments, by adhering to the iris, might cauſe it to contract; which would as certainly bring on blindneſs, as any other cauſe whatſoever. And I cannot but very much impute the indifferent ſucceſs which he met with, in the courſe of his practice, to his manner of uſing the Kiſtitome, or ſome of its natural conſequences, juſt pointed out. At length, diſcouraged, as it ſhould ſeem, by the failures he met with; he, afterwards, in the treatiſe above referred to, propoſes to adopt Mr. Sharp's method, of bringing away the capſula together with the cryſtalline, on the point of a concealed needle; though it does not appear, that either of them ever actually operated in this way *.

* Ulteriori experientiæ relinquo, an quæ propoſui rejicienda vel proſequanda ſint. Richt. Id. Cap. 6. p. 102.

M. Richter

M. Richter had ſeen them occaſionally come away together, four inſtances of it, as he ſays, having occurred in his own practice of the common proceſs of extraction. By theſe caſes, in which the effect was merely accidental, he appears to have been grounded in the opinion, that the like was to be effected in Mr. Sharp's method, with a few additions of his own, in all other caſes whatſoever. Inſtead of drawing this too ſtrong and haſty concluſion, he ſhould have recollected, that the thing he aimed at was only practicable, when the natural attachments of the capſula had been previouſly looſened, by ſome unknown cauſe, ariſing out of the eye itſelf. This could happen but ſeldom: and when it did, the addition of the capſula, &c. to the cryſtalline would enlarge the bulk ſo much, as greatly to endanger the pupil in paſſing through it. On the latter account, what M. Richter was ſo ſolicitous, ſhould take place in common, was far from being deſirable in any inſtance;

as

as it could not but rather impede than promote the ſucceſs of the operation.

"If the moderate preſſure of the curette, recommended in the deſcription, be not ſufficient to expel the cataract; it may be aided by the gentle application of the finger, either on the upper or lower part of the conjunctiva, as circumſtances ſhall point out. If the cataract does not give way to the preſſure now deſcribed; it will in general be found, that the inciſion in the cornea, or that in the capſula, or both, is too ſmall. The former of theſe may be enlarged by a pair of little crooked ſciſſars; and the latter by the reapplication of the Kiſtitome; which being properly done, the cataract will not fail to come away. But, though the cauſe of its not doing ſo before is no other than that juſt aſſigned; this is, however, too commonly imputed to its adherence to the iris, or ſome other part, with which it is in contiguity. It is granted, and is, indeed,

indeed, certain, that cataracts do ſometimes adhere to their capſulæ, and the latter to the iris. But cataracts of this ſort are capable of being diſtinguiſhed before hand, by the criteria already laid down. On that head, it was particularly obſerved, that as the adherences attending them generally indicate a morbid ſtate of the humours, or of ſome other parts of the eye; cataracts accompanied by theſe ſymptoms are excluded from being proper ſubjects of the operation; at leaſt, they cannot be undertaken without great uncertainty of ſucceſs. And if, in any caſe, unexpected attachments are diſcovered during the operation; the curette is, of all others, the moſt convenient inſtrument to be uſed for making the needful ſeparation.

I have before conſidered and endeavoured to obviate, an exception made to extraction, in the caſe of the low ſeated eye. I ſhall here take notice of another, and as far as I know, the only remaining difficulty which can be

ſuppoſed

ſuppoſed to lie in the way of this operation: and that ariſes from the ſmallneſs of the pupil. It has been ſaid, that the cryſtalline cannot paſs through a pupil, the aperture of which is much conſtricted; and that, in ſuch inſtances, any attempt to operate by extraction muſt be fruitleſs. Or, if, as in ſome caſes, the pupil, though ſmall, will yet admit of the cataract being carried through it, by applying a more than common degree of preſſure; it is objected, that the force here required for the purpoſe will ſtretch the pupil beyond its tone, and ſo bring on a fixed contraction of it: or, if the pupil does not, by dilating, yield to the preſſure, it muſt of neceſſity be lacerated; and thus loſing its figure, muſt together with that loſe its uſe. It will be a ſufficient reply to theſe ſuppoſed exceptions, to obſerve, that the pupil, if it be in a ſound ſtate, however ſmall, is found to yield to preſſure, if moderately and gradually laid on, ſo as to dilate ſufficiently

ently for the diſcharge of the cataract, without any injury whatſoever.

M. Schæfer was of opinion, that the degree of preſſure, employed by Baron de Wenſel, would, at the ſame time that it diſcharged the cryſtalline, immediately ſupply its place, by filling up the evacuated foſſula with the vitreous humour; and there leaving it in a proper ſtate of convexity. In this ſtate, he ſuppoſed the vitreous humour to be capable of refracting the rays of light, and that it would thus ſerve as a ſubſtitute for the cryſtalline *. Now this may be ſufficiently aſcertained, by obſervations made on the eyes of animals. And, on ſuch eyes, I have always found, that though the vitreous humour will, indeed, immediately ſo far fill the place of the diſcharged cryſtalline, as to ſtand even with the margin of the foſſula; yet that no preſſure can add any degree of convexity to it, longer than that preſſure continues. In ſhort, the effect

* Richt. Id. cap. 6. pag. 57.

of

of the alteration made in the eye with reſpect to viſion, by the loſs of the cryſtalline, ariſes more from the quality, than the modification, of what ſupplies its place.

The cavity, which was before occupied by the ſolid and convex lens of the cryſtalline, is now filled up by the vitreous humour; and the general defect, occaſioned by the loſs of the cryſtalline, is ſoon amply ſupplied by the aqueous humour; both which are much thinner than the cryſtalline. And hence it will neceſſarily follow, that, though the eye will be fully repleniſhed by theſe humours, yet, by reaſon of their leſs conſiſtency, they can never, by preſſure or any other means whatſoever, be made fully to anſwer the ſame purpoſe as the cryſtalline. To ſupply the defect; the eye, after the operation, will, in general, be found to require the aid of a convex glaſs; in order to refract the rays of

light.

light. This will always be the caſe in eyes of a regular formation. There are, however, ſome few inſtances of cataractous eyes, which were before ſo myopic or ſhort-ſighted, that, after the cryſtalline is extracted, the patient will be ſtill able to read ſmall print, without the aſſiſtance of any glaſs. It is alſo no leſs deſerving notice, that there are on the other hand, ſome eyes, which, in their natural conſtruction, are of the preſbytal kind, or more long ſighted than uſual; and which, by the removal of the cryſtalline, will be rendered much more ſo: in all which inſtances, a convex glaſs of the ſhorteſt focus will be found ſo neceſſary, that unleſs the ſight be thus aided, the patient, after all that can be done for him, will ſee very imperfectly.

It appears from what has been ſaid, that when the wounds in the cornea and capſula are performed according to the directions given in the deſcription; they

afford not only ſufficient room for emerſion of the opake cryſtalline, but alſo, after that is removed, for the free introduction of the curette through them. By this inſtrument, any feculencies remaining in the capſula, within or without the pupil, may alſo be taken away, with the greateſt certainty; and with no leſs ſafety, to that tender part, as well as to all the interior parts of the eye: in both which views, the curette is, I think, much to be preferred before any of the inſtruments, invented by Tenon, Berenger, Ternhaaf, Le Cat, or others.

[h] In ſhutting the eye after the operation, it is of ſome importance, that the lower lid be held down, till the eye is covered by the upper. If this is not obſerved, the ciliary edge of the lower lid may poſſibly turn inward; and even inſinuate itſelf between the lips of the inciſion in the cornea.

I have myſelf, more than once, ſeen this accident to follow, for want of attention to the circumſtance juſt pointed out, ſmall and inſignificant as it may at firſt ſeem; and where it has not been diſcovered ſoon after it has taken place, it has been often found to defeat the ſucceſs of the operation.

The aqueous humour, which is ſecreted with great rapidity and in large quantity, is, at firſt, notwithſtanding the horizontal poſture, plentifully evacuated through the wound in the cornea. But ſo long as the patient remains in that poſition, the eye will continue filled up by the ſame humour; whereby its convexity will be preſerved, and the iris ſuſpended in its natural ſtate. The good effect of this will be, that the iris cannot then fall into the wound in the cornea, and ſo cauſe a ſtaphiloma; nor can its pupil be liable to take an oval or any miſhapen form: which evils frequently ariſe from the ne-

glect of this poſture of the head after the operation.

SECT IX.

On Inflammation, as the Cauſe of ſpurious Cataracts.

We learn by experience, that the uſual and almoſt immediate effects of inflammation upon diaphanous parts are—an increaſe in thickneſs, and a loſs of their tranſparency. They are alſo no leſs liable, in common with all opake membranes, during their inflammatory ſtate, to form adheſions to thoſe parts which ſtand in near connection with them. If the inflammation be neither violent nor laſting; both the thickneſs and opacity, brought on by it, will ſometimes ſo entirely ſubſide, as that theſe membranes perfectly recover their original tranſparency. But if the inflammation be of long dura-

tion;

tion; and, eſpecially, if it be attended with ſevere pain; the tranſparency will be ſucceeded by a fixed whiteneſs, irremediable either by time or ſkill.

In external inflammations, or thoſe which affect the outer part of the eye only, the ſclerotica, the conjunctiva, and the cornea are all liable to be affected. Of its effects on the two former of theſe parts, as not being diaphanous, nothing more will be here ſaid: but thoſe, which it has on the cornea, will be particularly noticed; becauſe a due attention to them may enable us to form a clearer judgment of the effects, which it has, or is likely to have, on the inner and leſs vifible parts of the eye, which are of the ſame diaphanous nature. In an external inflammation, then, the cornea may ſuſtain every degree of change; from the ſmalleſt ſuperficial cloud on its ſurface, to an alteration of its whole texture; and this, not only from tranſpa-

rency to a fixed whiteneſs through its whole ſubſtance; but even ſo far, as that its ſphere and texture ſhall be variouſly mutilated. So great a change in the cornea, as that laſt mentioned, muſt inevitably occaſion a loſs of ſight; even though every other part of the eye, may yet remain unaffected. And hence I go on to obſerve, that, in an inflammation of the capſula cryſtallina, which, in contradiſtinction to that laſt ſpoken of, may be conſidered as of the internal kind—the part affected, being of the ſame tranſparent or diaphanous nature, as the cornea *, it muſt, of conſequence, in itſelf undergo the ſame change; or be rendered no leſs incapable of ſerving the purpoſe of viſion. But, beſides this, on account of the vicinity, which the capſula cryſtallina has to other parts of the eye, ſuch as the iris, proceſſus ciliares, &c. it can ſeldom happen, that this membrane will itſelf be inflamed, without affecting, more or leſs,

* Zinn. cap. 5. De capſula lentis, pag. 136.

theſe other contiguous parts: and this may leave behind it bad effects of differant kinds, which could have no exiſtence, if the capſula only had been inflamed.

Theſe effects will diſcover themſelves in a great variety of ways. They are too many to be all particularly enumerated. Suffice it in general to ſay—hence ariſe the opake nebulæ, ſeen in the capſula which has been inflamed, combined with a ſtrange variety of alterations in the figure of the pupil—all which are occaſioned by adherences, entire or partial, between the diſeaſed capſula and the iris. Some defect of ſight muſt neceſſarily be brought on by theſe nebulæ; and that muſt be greater or leſs, in proportion to their extent, and the degree of obſtruction which they of conſequence form. One dire effect of the diſorder, here treated of, is, a fixed adheſion of

the capſula to the pupil; cauſing ſo great a contraction of the latter, as that all which can be ſeen of the capſula through it, amounts to no more than a very ſmall white ſpeck. The poſterior chamber of the aqueous humour, in all ſuch caſes, is likewiſe diminiſhed, in proportion to the degree of the adheſion; and whatever that may be, a ſeparation is not hearafter to be effected by any means whatſoever, ſo as to reſtore the chamber to its original ſtate. An entire contraction of the iris, without any of the preceding concomitants, occurs but ſeldom: though ſuch caſes have happened; and Mr. Cheſelden accordingly propoſes an operation for them. His proceſs is—to make an aperture, or artificial pupil, through the iris, with an inſtrument which he calls an iris knife; and which is to be introduced through the ſclerotica, in the ſame manner as the couching needle—For my own part, I cannot but be of opinion, that ſuch an aperture might be made with

leſs

leſs difficulty, and more certainty, by means of an inciſion of the cornea, as in extraction.

Suppuration is another effect of inflammation. This, though common to all the membranes of the eye, whether tranſparent or opake, is attended with peculiar phenomena, when it takes place within the eye. When pus or matter is formed between the lamina of the capſula cryſtallina, it will leave the ſame effects in it, as are found to follow the ſame cauſe in the cornea; that is, it will produce an opacity, ſimilar in appearance to what has been lately noticed to ariſe immediately from inflammation. When matter is depoſited in the anterior chamber of the aqueous humour, it ſhould be let out, as ſoon as it is formed, by making an inciſion in the lower part of the cornea, agreeably to its circle: and if more be collected afterwards, the ſame operation muſt be repeated, as often as occaſion re-

quires. If the depoſited pus be ſuffered to remain, it will ſoon inſpiſſate, and adhere to the inſide of the cornea, beyond the poſſibility of removal; which muſt end in the deſtruction of its pellucidity. When matter is depoſited in the poſterior chamber of the aqueous humour, if it continues there long, it will become thick and gelatinous; and will commonly adhere to the iris, and capſuſa cryſtallina, ſo as to unite theſe parts together. This conglutination will, in the end, ſtill more certainly, than any other of the effects of inflammation, deſtroy the poſterior chamber of the aqueous humour.

There are yet other ways, in which this internal opthalmy is ſeen to diſorder the eye, and which have all the ſame pernicious tendency to obſtruct and impair the ſight, in a greater or leſs degree. I will mention a few of the worſt. When the inflammation reaches the retina, the pupil is ſometimes ſo enlarged, as nearly to

equal

equal the circle of the cornea. In other caſes, the humours appear, as if they were diſſolved into a clear and thin fluid: and, in others, again, ſo great an alteration takes place, as that the humours appear like ſo many coloured and heterogeneous ſubſtances. I had lately an opportunity of examining near eighty perſons in Greenwich Hoſpital; the greater part of whom became blind from the general cauſe, of which I have been now ſpeaking: and the appearances which their eyes had, were indeed too multiform, for any words fully to deſcribe them. After all, it is to be added, that inflammation, or the internal opthalmy, has not always the ſame fatal iſſue. The exceptions to it form three diſtinct kinds of caſes, which are conſidered as ſo many ſpecies of falſe cataracts. Two of theſe have been frequently touched upon, in this treatiſe; but all of them will now be diſtinctly and particularly inſiſted on.

SECT. X.

On three Species of ſpurious Cataracts.

The firſt ſpecies of the ſpurious cataract is called the opake capſula cryſtallina; and becauſe it uſually follows another, that is, the true cataract, it is therefore alſo called the ſecondary cataract.

In this ſpecies of the ſpurious, it is eſſential to render it a fit ſubject of operation, that the opacity does not extend beyond the fore-part of the capſula cryſtallina; and alſo that there be no adheſion to the iris: for, if the poſterior portion of the capſula be affected, the operation cannot reach it; and adhefion will manifeſt ſuch a diſordered ſtate of the eye in other reſpects, as would defeat the end of extraction. The immediate cauſe of opacity, of which I have been ſpeaking, is inflam-

inflammation, or the internal opthalmy. But this may be brought on by various cauſes, both internal and external; and none is more frequent, than the operation it ſelf which hitherto has been commonly uſed for the cure of the cataract; I mean that of couching *. Many experienced oculiſts are ſo clear in their opinion, that this opacity of the capſula cryſtallina, in caſes of eyes which have been couched, ariſes from ſome injury received in the proceſs of that operation; that, in extraction, they always remove a little piece of the anterior membrane of the capſula, before they proceed to the cryſtalline itſelf. Without ſome ſuch proceſs, it could not be known with any degree of certainty, whether the cryſtalline was removed by the former operation, or ſtill remained in its place; and if there, whether it was tranſparent or opake: and without the previous determination of thoſe circum-

* Mem. de l'Acad. Chir. Tom. 2. pag. 425.

ſtances,

ſtances, the operator muſt be at a loſs how to proceed.

The firſt account of this diſorder of the capſula which I have met with, is given by M. de la Peronie and Morand, in the year 1722 *. In the year 1732, M. Benomont produced another inſtance of this kind, in an eye diſſected by him before the Royal Academy of Surgery †. In 1753, M. Houin gives a caſe, which is directly and fully in point, of an eye couched by Hilmer ‡. For, though as ſoon as the operation, in the laſt inſtance, was performed, the original cauſe of the patient's blindneſs was removed, as was made certain by his ſeeing again; yet, on taking off the covering from the eye

* L' Hiſtoire de l'Academie Royale des Sciences. An. 1722.

† Mem. l'Acad. Chir. Tom. 2.

‡ Mem. de l'Acad. Chir. ſur une eſpece de cataracte novellement obſervee, par M. Houin, tom. 2, pag. 425.

after

after continuing it as long as uſual, an opacity of the capſula diſcovered itſelf, and the ſight was a ſecond time wholly loſt. On the death of the patient, M. Houin carefully inſpected this eye: when he found the cryſtalline to be at the bottom of the eye, while its capſula remained in its place, ſomewhat thickened and opake.

Doctor Andrew Cantwell, in a letter to Doctor Parſons *, containing a further account of M. Daviel's method, obſerves, that not only the cryſtalline, but ſometimes even its whole capſula, becomes opake; though in different inſtances, the latter was found to be ſo, both with and without adheſion to the cryſtalline—But that whenever the anterior portion of that membrane only was found opake, and the cryſtalline tranſparent; the patient recovered his ſight, by extracting ſo

* Philoſoph. Tranſact. vol. 52. part 2. art. 82. page 519. A. 1762.

much

much of the opake part, as to make an aperture in it anſwerable to the pupil.

In confirmation of theſe diſcoveries, he ſent Doctor Parſons the three following ſpecimens as proofs, which he diſtinguiſhed from one another by the Numbers, 1, 2, 3.

(1) An opake portion of the anterior membrane of the capſula; which, the cryſtalline being tranſparent, had been operated on, and with the beſt effect, as juſt deſcribed.

(2) An opake cryſtalline, and a portion of the anterior ſide of the bag quite opake: in which caſe the ſight was recovered by operating on both the affected parts.

(3) The whole capſula and cryſtalline opake. On which laſt inſtance he obſerves, that if, in any of this kind, the poſterior ſide of the bag adheres to the foſſula of the vitreous humour, the patient muſt remain blind, unleſs it be extracted; and that in attempting this, there

is great danger of the vitreous humour running off.

The ſecond ſpecies of the ſpurious cataract is independent of the capſula cryſtallina; and, as it ſuppoſes the formation of a foreign membranous ſubſtance in the poſterior chamber of the aqueous humour, may, I think, not improperly be thence denominated—the adventitious membrane. The primary cauſe of this, as of the two other falſe cataracts, is an inflammation of the interior parts of the eye. But the immediate cauſe of it, and alſo of the third ſpecies, as diſtinct from the firſt, is the formation of pus or matter, in conſequence of inflammation.

It was before remarked, that when matter is depoſited in the poſterior chamber of the aqueous humour, the longer it remains there, the more it will thicken; and will, of conſequence, in general, cauſe the contiguous parts affected by it, to adhere more ſtrongly to each other. The adheſion, however, it muſt be here particularly noticed,

ticed, is not the ſame in all caſes. It is, for inſtance, conſiderably leſs where the pus forms itſelf into the appearance of a membrane; in which the adheſion ſeldom goes further, than round the outer edge of the membrane. The certainty of this, as a fact, is not to be diſputed: and it is plain, that there muſt be ſomewhat in the quality of the matter in this caſe, which renders it leſs adheſive; but from what particular cauſe that difference ariſes, I will not take upon me to determine. This membrane, in the circumference or outer edge, which is the ſeat of its attachment, inſinuates itſelf into the interſtice, between the larger circle of the iris, and the termination of the ciliary proceſſes. Hence it expands itſelf in ſuch a manner, between the iris and cryſtalline lens, as to divide the poſterior chamber of the aqueous humour into two diſtinct parts; between which it floats according as it is acted upon: agreeably to the ideas which the antients entertained, though erroneouſly, of the true common

cataract. In this caſe, when the pupil is contracted, and the poſterior chamber is by that means leſſened; the aqueous fluid behind the ſpurious membrane, not being able to eſcape into the anterior chamber, as it always does when not obſtructed, carries the membrane or cataract forward, and forces it into the pupil, in the form of an hernial ſack; by which the further contraction of the pupil is prevented. As ſoon as the pupil is again dilated; the projection diſappears, the membrane reſumes its former ſituation, and becomes plain as before. From the remarks already made it is evident, that this membrane muſt be ſituated conſiderably nearer the pupil, than either the real, or ſecondary cataract, and therefore eaſily to be diſtinguiſhed from both. It is found ſometimes to vary in its conſiſtence; but, in general, it is thick, tough and ſmooth. And it is alſo to be obſerved, that though it is always attached in the outer edge, and that only; yet the circumference is

of leſs extent in ſome caſes, than above deſcribed.

It is in all caſes neceſſary, to render this membrane a fit ſubject of operation, that it preſerves its ſeparation from the capſula; and alſo from the iris, ſo much as not to prevent its action; both which circumſtances are pre-requiſites ſo eſſential to the ſucceſs of the operation, that without them there cannot be the ſmalleſt hope of it.

Several inſtances of this ſpecies of the membranous cataract are given by very reſpectable practitioners. M. Heiſter diſcovered one in diſſecting a dead eye; and he was informed of two others by Profeſſor Wideman. Lanciſi alſo ſent him an account of two ſuch, which he found in the eyes of Garelli, Archiater to the Emperor. St. Yves mentions ſeveral ſpecies of membranous cataracts: but, as he has not ſpecifically diſtinguiſhed them

from each other; without entering at all into his theory, I ſhall content myſelf with only obſerving on his practice, that he operated on one very ſimilar to that I have above deſcribed; and the patient's name was Vibaud. This operation he performed by an inſtrument, which he paſſed through the ſclerotica, after the manner of couching. By this means, he removed the membrane entirely from behind the pupil: but the ſight was not reſtored by it; the reaſon of which, as he found afterwards, was, that the patient had alſo a gutta ſerena. He relates two other caſes of a ſimilar kind—In the one of which, as the membrane was not compleat, and the patient could ſee a little, it was therefore never operated on; and the other, after ſome time, wholly ſubſided of itſelf—M. Richter relates two caſes, of a Taylor, and another perſon, as inſtances of the opake capſula cryſtallina: but both theſe relations correſpond ſo exactly with the above recited caſes of

the adventitious membrane, that I am fully perſuaded they were of the ſame ſpecies. And, indeed, he was himſelf ſo doubtful of their nature, that he aſks, in reference to thoſe very caſes, An opacitas in membrana cryſtallina*? About fifteen years ago, I was myſelf preſent, when M. Challibert operated with ſucceſs, by extraction, on a man who had two full formed cataracts of this kind. Theſe had been miſtaken for the true cataract of the cryſtalline; and, as ſuch, Mr. Taylor had twice ineffectually couched for them. In the courſe of my own practice, I have alſo met with ſeveral caſes of this kind; and think myſelf juſtified in ſaying with M. Heiſter, that they occur oftener than is generally ſuppoſed. Not only M. Richter was miſtaken in the two inſtances above referred to; but Haverman, and even Daviel, were ſometimes ſo far deceived, as not to diſtinguiſh the opake capſula cryſtallina from

* Richt. Id. cap. 9.

that

that I am now ſpeaking of; as may, I think, be very juſtly concluded from their mode of operating upon it. For, had the opacity of the capſula been at firſt diſcovered by them; they would not have began to operate upon it, in the manner they did, as if it had been for the true cataract. When they found, that the ſuppoſed true cataract did not come away, after the inciſion of the cornea was compleated; it was their practice then to puncture the capſula, and to compreſs the globe of the eye with the curette or the finger, in ſuch a manner, as that the cryſtalline, whether clear or opake, muſt have followed, if the opening had been made in the capſula: as is, indeed, acknowledged by M. Richter himſelf *. When they ſtill found that the cryſtalline did not paſs; they, then, taking it to be ſomewhat membranous, which formed the obſtruction,

* Dilacerata hac membrana, lens cryſtallina prorumpit, opaca ſit nec ne, retineri enim nequit, etiam ſi omni vitii expers ſit—Richt. Id. Cap. 9. pag. 86.

directed their application to it accordingly: and, in their endeavours to remove it, ſometimes brought away a ſubſtance, which they took to be a portion of the capſula of the cryſtalline; but which I rather take to have been the opake membrane here treated of.

The third ſpecies of the ſpurious cataract may be called the moveable or flowing cataract.

This ſpecies of the cataract, as well as the two former, originates in inflammation. But its more immediate cauſe, like that of the ſecond of the ſpurious kind, is, matter depoſited in one or both the chambers of the aqueous humour. And the chief point of diſcrimination between this and the ſecond is, that the inſpiſſated pus, neither itſelf adheres to any one part within the eye; nor cauſes an adheſion of any of thoſe parts to each other. It generally forms itſelf into one maſs; but is ſometimes found divided into ſeveral

ral portions, unconnected with each other, and differently ſhaped: and whether it be whole or divided, it is very ſimilar in colour and conſiſtence to hardened fat or ſuet. If the matter which forms this cataract be ſmall enough, whether it conſiſts of one or more pieces, it will paſs and repaſs through the pupil, according to the poſition of the head. If the head lies prone, the cataractous ſubſtance will make way through the pupil into the anterior chamber of the aqueous humour: but no ſooner is the head reclined, than it will paſs into the poſterior chamber. If, again, the head be turned on one ſide, the cataract will then deſcend towards the oppoſite angle of the eye, and ſo vice verſa. If, on the other hand, the maſs of inſpiſſated matter be too large to go through the pupil, whether it remains before or behind it, it will often be ſo ſituated, as to block it up entirely. This poſition of the cataract is, however, capable of being altered in ſome degree, by

holding the head for a ſhort time in a lateral poſture; and in conſequence of that alteration, a little degree of ſight will again be reſtored to the patient. By theſe variations in the poſition of the cataractous ſubſtance, according to that in which the head is kept, it appears, that the contents of it are ſpecifically heavier than the aqueous humour. Though, in the authors I have ſeen, no notice is taken of any diſorder of the eye, of that particular kind which I have now been deſcribing; I yet cannot but think myſelf juſtified in conſidering it as of the cataractous ſort; and accordingly inſerting it as another and diſtinct ſpecies of the ſpurious ones. As ſuch, I have myſelf operated upon it by extraction; and can ſay from experience, that I know not any caſe in which the operation is more likely to ſucceed.

SECT.

SECT. XI.

On the Operations for the ſeveral ſpurious Cataracts.

The propriety of an operation, in any caſe of theſe ſpurious cataracts, as well as in the true one, muſt be determined by the motion of the iris. If that neither contracts nor dilates, on light being preſented or withdrawn; there is then no more reaſon here, than in the true cataract, to expect relief from an operation. It is certain, that the adventitious membrane, though commonly thick and opake, as well as the thinner capſula of the cryſtalline, or ſecondary cataract, will admit at leaſt ſo much light, as to affect the retina; the ſenſibility of which, or the contrary, as was before ſaid, is proved by the active or paſſive ſtate of the iris. Much as theſe ſpurious cataracts differ from one

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another, in their ſituation, texture, extent and other particulars; they are yet all proper ſubjects of the operation of extraction: though the proceſs muſt neceſſarily vary in ſome reſpects, according to their different nature. I ſhall now deſcribe the manner of operating proper to each.

The deſign of the operation, in the two former ſpecies, is, to make an opening in the opake membrane, by which the light may regain admiſſion to the retina; and in the third, the cataract is taken entirely out of the eye.

In each of the three caſes, the cornea muſt be punctured, and divided in the very ſame manner, as if the opake cryſtalline was to be extracted; and, of conſequence, the ſame inſtrument muſt be ſo far uſed in one caſe, as in the other. But here ſome variations muſt take place. In the firſt of the ſpurious cataracts, a

piece

piece of the forepart of the capſula of the cryſtalline is to be extracted. On account of the deep or low ſituation, in which the membrane, in this inſtance, lies, it will be neceſſary to uſe a ſmall and fine pointed inſtrument. That commonly uſed for the purpoſe is about the ſize of the round couching needle, and a little bent at the point, after the ſame manner, but not ſo much, as the tenaculum: and this inſtrument had beſt be made of gold, as that is the pureſt metal.

The cornea being divided, the point of the inſtrument, juſt deſcribed, with the convex or bent part upwards, is to be introduced under the flap of the cornea, and to be continued in a gradually aſcending direction, till it comes to be parallel with the ſmaller circle of the iris—the point muſt then be turned toward the pupil, and carried through it; puncturing the cataractous membrane all round,

round, in the circular direction of the iris—the punctured part will, in common, be eaſily brought away by the needle: but if that cannot be done, as will ſometimes happen, it muſt then be taken out by the forceps—I have only to add here, reſpecting the above proceſs, that particular care ſhould be taken, in withdrawing the inſtrument, to reverſe the convex part downwards; without which, the point would be liable to hitch in the iris, and, by ſo doing, might be the occaſion of great miſchief.

In operating on the ſpurious membrane, as that generally is of a thicker ſubſtance, and is ſituated higher, than the capſula, the moſt convenient inſtrument, for executing what is here wanted, will be—a ſmall convex ſciſſars, with one of the blades very thin and fine pointed, and the other made as uſual—The ſciſſars muſt be firſt introduced, in a cloſed ſtate, under the flap of the cornea; when

when a punctuation muſt be made through the membrane with the ſharp and pointed blade; keeping as near as poſſible, in its direction, to the marginal edge of the pupil.

The ſciſſars, one point of which is now within, and the other without, the membrane, are then to be conducted upward and forward; cutting as they proceed, in the direction of the round margin of the iris, as far as the hand can operate in that poſition. The hand being then reverſed, the ſection muſt be continued, firſt downward, and then upward, till it is carried compleatly round. By this a portion of the membrane, about the ſize of the pupil, will be ſeparated; which, if it cannot be brought away upon the point of the ſciſſars, may be extracted by a ſmall forceps.

The operations now deſcribed, in the caſe of the two firſt ſpurious cataracts, will

will in general be found to ſucceed. If in either there is a failure, which will ſometimes happen, it muſt be owing to one or other of the following cauſes—In the firſt inſtance, there may be an opake cryſtalline, or true cataract, remaining in its foſſula, after attempts made to depreſs it—and ſhould that be the caſe, a ſecond operation in the ordinary way of extraction, as before laid down, muſt immediately take place. But if ſucceſs does not attend the other of the two proceſſes, I mean that for the ſpurious membrane; there will then be reaſon to ſuſpect, that the more interior parts of the eye are diſordered: and for this there can be no remedy.

The whole operation for the moveable or floating ſpurious cataract conſiſts in the ſection of the cornea to the ſame extent, and nearly in the ſame manner, as that made for extracting the true cataract; excepting only, in this caſe, it muſt,

for

for a reaſon which will hereafter be given, be executed with rather more rapidity. That being done, the opake ſubſtance, whether it lies in the anterior or poſterior chamber, together with the aqueous humour, will, as in the common cataract, diſcharge itſelf on the cheek.

I ſhall conclude this ſection with remarking, that if, in either of the three ſpurious cataracts, the operation ſucceeds, the patient ſees much more perfectly, than thoſe operated on for the true cataract, whether by depreſſion or extraction. The obvious cauſe of this is, that whereas in the operation for the true cataract, the cryſtalline comes away with it; in thoſe for the ſpurious, it retains its natural ſituation after the cataracts are removed: ſo that the eye, having ſtill the aid of that humour, will have no need of glaſſes, to ſupply its place as a lens; which muſt always be the caſe, when the cryſtalline is diſplaced. Some particulars of

uſeful

uſeful information, on the ſubject of this ſection, will be ſubjoined in the next.

SECT. XII.

Incidental Remarks, relative to the ſpurious Cataracts.

On the firſt of theſe, called the ſecondary cataract, I have already obſerved, that it never was diſcovered with any degree of certainty, but by operating in the way of extraction, as for the true cataract. And it may aſſiſt the operator in making ſuch diſcovery, further to remark here, that ſuch a ſtate of the capſula is to be ſuſpected, when, on its being punctured by the Kiſtitome, the inſtrument meets with ſome conſiderable reſiſtance from that membrane: but if, at the ſame time, the lips of the wound made in it, have a whitiſh and opake appearance, there is then no room left for doubt of the exiſtence of a ſecondary cataract. Whenever the operator finds this

to be the caſe, he ſhould then inſert the blunted end of the curette into the wound of the capſula, and move it gently round, ſo as to enlarge the aperture ſufficiently for the patient to ſee: which he will immediately do, if the cryſtalline is not alſo become opake; and if it is, that muſt be extracted, as in all other caſes. If the cryſtalline is found to retain its tranſparency, and the capſula be of a ſoft and pliant nature, as is ſometimes the caſe; the aperture made in the latter continuing open, the patient's ſight will return of courſe. But if, on the contrary, the capſula be of a harder conſiſtence, the aperture, made by the curette, will ſoon of itſelf become as narrow, as at firſt: and, in that caſe, it will be neceſſary, after puncturing the membrane circularly, to extract it. I met with an inſtance of the ſoft capſula, in my own practice, about twelve months ago; and, in conſequence of its being treated as above directed, the ſight is perfectly reſtored.

The adventitious membrane is, in ſome caſes, ſo very tough, and, at the ſame time, ſo lax, that it cannot be penetrated by the fineſt pointed ſciſſars. When this ſtate of the membrane takes place; there is, in general, ſo great a diſſolution of the cryſtalline and vitreous humours that, inſtead of ſupporting the membrane, againſt external force, as they would do in their natural ſtate of conſiſtence, they now leave it under an incapacity of reſiſting the ſmalleſt impreſſion. If, in ſuch a caſe, the attempt to pierce the membrane be continued too long; the whole diſſolved contents of the globe will be in danger of being forced through the wound in the cornea: and, even though the operation ſhould be compleated, ſtill the ſight would not be reſtored, by reaſon of the diſeaſed ſtate of the eye.

I have ſaid, in deſcribing the operation for this membrane, that the ſciſſars ſhould firſt enter it juſt within one ſide of

of the circle of the iris, in preference to any other part—My reaſon is—that this membrane, being generally of an elaſtic nature, is no ſooner wounded, than the divided parts inſtantly recede from one another. When therefore the operation is begun in this point, the larger portion, with which only we have here to do, retiring towards the oppoſite ſide, will, in that direction, be more eaſily taken hold of by the ſciſſars and forceps, than had the receſſion been from the bottom towards the top, or in any other direction. When the aperture is thus made, a central piece may, in moſt caſes, be cut off and extracted, notwithſtanding the elaſticity of the part. It will, however, ſometimes happen, that this membrane is ſo extremely ſlippery, as to elude the chaps of the ſciſſars, and cannot therefore be brought away by them: in which caſe, the ſeparation muſt be made, and the buſineſs finiſhed by a very ſmall, but rough mouthed, forceps.

After all, there may be caſes, in which, though the membrane has been ſufficiently punctured, the extraction cannot be effected by any inſtrument whatever. I remember an inſtance of this kind, where the receſſion of the membrane, from below upwards, was ſo great, that not a ſtep further could be taken in the operation. The patient ſaw very well for ſome time after: but the membrane then began to deſcend again towards the iris; to which it at length attached itſelf, and, brought on an incurable blindneſs.

Judging from accounts, they, who have hitherto operated upon theſe membranes by extraction, have uſed only one inſtrument for both the two firſt ſpecies of ſpurious cataracts—Daviel, the couching needle—Richter, the Kiſtitome—Baron de Wenſell, a ſmall fine pointed ſtyle of annealed wire—Havermam, a forceps—Schæfer, Le Cat, Thurant, and others, different inſtruments; which each

of them ſeverally contrived for himſelf—But of theſe I ſhall ſay nothing further; as every purpoſe, for which any of them could be requiſite, is, I apprehend, ſufficiently provided for, in ordinary caſes, by the gold wire, for the opake capſula; and the ſciſſars, for the adventitious membrane: and, in both theſe ſpecies, the forceps is to be uſed, when occaſion ſhall require.

The reaſon for cutting the cornea with more than uſual rapidity, in the caſe of the moveable ſpurious cataract, is, that the cataract and aqueous humour may come away at the very moment, in which the ſection of the cornea is compleated. And the neceſſity of this is obvious: for, if the cataract remains, after the aqueous humour is diſlodged; it is very apt to recede ſo far behind the iris, that it cannot, at that time, be extracted by the curette, or any other inſtrument.

But

But if, owing to the want of ſufficient quickneſs in making the ſection of the cornea, the cataract does not immediately paſs; the operator had better make no further attempt, till the wound in the cornea is healed, and the chambers are again filled with the aqueous humour; when the cataractous ſubſtance will return to its former ſituation, and ſo will be as capable of extraction as ever, by a proper inciſion of the cornea.

F I N I S.