

**A treatise of a cataract ... with a distinct representation of the operations ...  
Also Mr. Daviel's comparative view of their respective merits ... extracted  
from the best authors / [George Chandler].**

### **Contributors**

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A  
T R E A T I S E  
O F A  
C A T A R A C T,

I T S  
Nature, Species, Causes *and* Symptoms,

W I T H A  
Distinct Representation of the Operations

B Y  
COUCHING AND EXTRACTION:

A L S O  
Mr. DAVIEL's Comparative View of their  
respective Merits;

T O G E T H E R W I T H  
Some Hints concerning Means for preventing  
its Formation, and superseding the Necessity  
of either Operation;

Extracted from the best AUTHORS.

With COPPER PLATES.

By GEORGE CHANDLER, SURGEON.

L O N D O N:

Printed by SAMUEL CHANDLER,  
For T. CADELL, in the *Strand*, and BROTHERTON  
and SEWELL, in *Cornhill*.

M.DCC.LXXV.

[Price Two Shillings and Six-Pence Sewed.]

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and G. ALLEN, in St. Paul's Church-yard.

M D C C C X V I I I  
[Price Two Shillings and Six Pence bound]

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P R E F A C E.

**M**R. *Sauvages's* very learned, very comprehensive, and very elaborate System of Diseases\*, of all kinds and species, falling into my hands, and its being a work entirely new in its way, and voluminous, I was tempted to run it over, and take a cursory view of the plan he proceeded upon, and of the order and method in which it was carried on; in doing which, I could not but observe, in his arrangement of the diseases, under their several classes, orders, genera and species, the necessity which the execution of his plan laid him under, of scattering the several diseases, relating to one

\* Nosologia Methodica.

and the same part of the body, here and there at very wide distances one from the other; so that in order readily to turn to any particular disease, his system must be first thoroughly examined and well understood; and even in that case, the reader would, I apprehend, be every now and then at a loss, under what genus or species to search for it: I made this observation more particularly, in regard to the various diseases of the Eye, which lie very widely dispersed from each other, according as it was necessary to dispose of them under the several heads of *Vitia, Vesaniæ, Debilitates, Spasmi, &c.* On contemplation of which, I was induced to search diligently through the whole work, and to bring down the several distinguishing appellations of the disorders pertaining to this part, together, that they might be seen at one view, referring to the pages where they were treated of; in order afterwards

wards, to take each of them into a more particular consideration: Accordingly having finished the catalogue, I turned my first thoughts towards the disease now generally called a *cataract*; as from the variety of conditions and circumstances to which it was liable; from the different opinions, relative to it, and more especially from the great importance of attending to it; as from its frequent pernicious effect in injuring, and if not remedied, wholly depriving us of sight, (a sense necessary to almost all the purposes of human life, and most conducive to human happiness) on all these accounts, I judged it highly deserving a prior consideration.

After having carefully examined Mr. *Sauvages's* account of it, I could not satisfy myself without a further pursuit, and search into the other authors of the best repute, who have wrote on this subject, from whom I have collected what seemed wanting in Mr.



*Sauvage*, and which appeared to me most worthy of observation; and have endeavoured to digest those materials into such order and language, as might, to the best of my power, convey the clearest and fullest ideas of the disease, in all its shapes.

It may perhaps be said, that there are many excellent treatises already on this subject: To this I agree, and allow that every one of them have indeed something particular deserving notice: But the greatest part of them are either in latin or in a foreign language, and the few which are written in our own tongue, contain chiefly the mere sentiments of their respective authors. These papers are intended to comprehend whatever appeared useful in each and omitted in the others. If any thing said in the following sheets should seem to militate against the present received opinions, it must be remembered, that I have not delivered my own sentiments

ments, but the sentiments of those writers my notes refer to.

It has been, and still continues to be much agitated, to which of the two operations the preference is to be given; whether to that of Couching, or the other by Extraction of the cataract. A particular account is herein given of each manner, with the several advantages and disadvantages ascribed by different writers to each; from whence the reader may see the present state of the controversy, and be better enabled to form his own judgment concerning it.

Several authors of great character, have thought a cataract to be remediable by internal remedies, if taken in its incipient state, and indeed have vouched some very extraordinary cures performed, and the sight restored when nearly lost\*. If credit is to

\* Celsus, Plempius, Riverius, Fabricius ab Aquapendente, Boerhave, Heister, Platner, Sauvage, Buchan.

be given to these representations, surely it deserves a more thorough consideration. Happy indeed is it that we are frequently enabled to remove it by an operation which surgery affords us, and which must ever be regarded as one of its most excellent and useful inventions: But if by internal means we could get rid of this evil, when beginning; prevent its coming to perfection, and supersede the necessity of an operation, which is attended with pain, long confinement, sometimes obnoxious to disagreeable circumstances, and the success of which is precarious, we should undoubtedly do a singular service to mankind. I have touched but slightly on this head, leaving it to those, the nature of whose education may have better qualified them to discuss and judge concerning it, confining myself more to that treatment which, as a Surgeon, I am better able to give an account of.

I am

I am not so vain as to obtrude this pamphlet upon the world as a perfect performance: I can only say, I have bestowed much care and time in drawing it up into its present form, and am not without hopes that it may appear to have some utility. I shall be thankful for any candid strictures made upon it, as it will still remain an object of my attention; shall be ever open to conviction, and shall take great pleasure in supplying any defects that may be observed in it, or to retrench any thing that is superfluous: And if this tract should meet with a kind acceptance from the public, it will be a motive to me to pursue the history of the other diseases of this noble part of the human body, I mean the Eye; materials for which I have already by me, and shall digest them into the best order I can, as my time and leisure shall permit.

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OF A

# C A T A R A C T.

## S E C T. I.

### *Description of a cataract.*

**A** Cataract is defined to be an abolition of sight, attended with a conspicuous opacity behind the pupil \*, which losing its natural black colour, becomes opake, and contracts colours foreign to it, such as white, grey, yellow, blue or ferrugineous †. In this case the *chrystalline lens*, or its coverings, viz. either the *arachnoid coat* in which it is enclosed; or the *vitreous*, with which the bed of the vitreous humour, in which the

\* Sauvages : Nosologia Methodica, tom. 1. edit. 4to. p. 719. † Heister, Institut. Chirurg. tom. 1. p. 592.

lens is seated, is invested, which naturally ought to be transparent, being rendered opake, reflects all the rays of light, but transmits scarcely any §; therefore no image of objects can be painted on the *retina*, and the sight thereof must be suppressed by means of this obstacle, although the retina and the other organs of sight are in the best state possible †.

The eye begins to be dim from a nascent and recent cataract, so as that the patient seems to perceive, as it were, a little cloud before it; this appears, from time to time, sometimes faster, at others more slowly, to grow thicker, and at length opposes itself so manifestly to the interior powers of sight, as to be outwardly discernible to every one who looks at it. As the disease advances, the sight becomes more and more dull, and at length is wholly lost.

§ Platner, Institut. Chirurg. 8vo. edit. p. 757. Sauvage, p. 719. † Sauvage, loc. citat.

Some have been blinded with a cataract on a sudden, or within a few days, which is wont most especially to happen, if the eye hath been greatly hurt by a blow, and the arachnoid coat of the lens hath been broke or inflamed\*. *Fabricius Hildanus* relates a case of a cataract arising in one night's time, from an incessant weeping for some days before †.

The same thing happens in a recent cataract, as does to those who look at objects through a very convex lens, viz. they see distinctly, only things near at hand, and placed at a determined distance, neither nearer nor farther off, or the sight is shortened from time to time. Moreover because the opacity of the spot, which at first represented a mist or

\* Platner, p. 765. St. Yves, *Traité des Maladies des yeux*, p. 195. *Fabricius Hildanus*, *Observat. Chirurgic. Centur. 5. Observ. 14.* See also *Max. Fernelius*, *Patholog. lib. 5. cap. 5.* and *Riverius*, *Praxis Med. lib. 2. cap. 4.* † *Centur. 4. Observ. 15.*



cloud placed in the bottom of the eye, increases by degrees, and tends gradually to a whiteness, it will appear to the oculist, on looking at it, to come nearer the cornea, or to be less deeply situated; for the same object seems to be placed nearer, because it reflects more light; for which reason, by how much the more that spot reflects the light, by so much the less it transmits to the retina; therefore by succession of time, the sight becomes more obscure in the cataract; and when the obscurity has done increasing, the cataract is said to be *mature* or *ripe*, at which time the patients can indeed distinguish the solar light, but cannot distinguish the colours and figures of bodies.

There are also persons afflicted with cataracts, who, on account of a conjunct fault of the retina, are, in the beginning, teased with a suffusion, or apparent vision of flies, or threads suspended in the air; but this  
suffusion

suffusion does by no means constantly accompany a cataract, nor ought it to be placed amongst its signs; and they err who suppose such like appearances are to be deduced from imagined streaks or opaque points in the chrystalline, whom *De Cbales*, in his optics, justly derides: Cataractous persons, possessing a faultless retina, see objects involved, as it were, in an uniform mist; but they see no distinct objects, or such as are circumscribed within certain limits fluttering in the air\*.

If the lens alone becomes opaque, and is contracted, but the arachnoid coat be entire and pellucid, the person, in the beginning, sees those things which are placed on one side of him better than those fronting him; he sees also better at night and in the dark, in which the pupil is widened, than in the day time, and in a great light. But when

\* Sauvage, p. 720.

the arachnoid coat is vitiated, it may be known by examining into the first origin of it, and into the disease which brought on this mischief; for it is used to arise from inflammation, by which, though discoloured, the sight grows dull and dim far the sooner, so as that in a short time all vision is lost. In this kind of cataract no sensation of light is left, nor can the person see better in the dark, although the pupil be dilated. The cataract itself, which is beheld within, is whitish, and as it were wrinkled\*.

The cataract above described is called a *simple cataract*, that is, as not being complicated with other inconveniences †; also the *true cataract* when mature ‡; it is moreover said to be *the most frequent and ordinary species* ||, and most likely to receive relief from the operation §.

\* Platner, p. 766. † Heister, p. 597. ‡ Sauvage, p. 721. || Heister, p. 598. § Platner, p. 773. also Heister, p. 600.

But we must not omit what Mr. *Heister* says further, viz. that although the true, ordinary, and most frequent cause of a cataract, is an opacity or obscurity of the chrySTALLINE humour; yet that he is far from denying but that it sometimes, though but rarely, is occasioned by a preternatural membrane or pellicle in the aqueous humour, of which he produces several instances; one of his own observation, another from *Lancisi*, and others from other authors ||. *Palsin* reports, that since the dispute on this subject, between Mr. *Woolhouse* and Mr. *Heister*, many instances of the kind have been found, by different persons, in human subjects; he enumerates above twenty, amongst which he reckons three by *Winslow*, three by *Lancisi*, and six by *Geisler* §. *Morgagni* also cites *Mauchart* and *Zeller* as having seen in each

|| *Heister*, p. 533-4.  
edit. Petit. 1753. tom. 2. p. 425.

§ *Anatomie Chirurgicale*,

eye of a woman, a thin and blackish pellicle placed before the pupil, firmly adhering to the cornea, near its internal circumference †; Dr. *Mead* indeed adduces one instance, (as a proof that a membranous cataract may exist) of a membranous tegument spread over the pupil of an infant, which was injected, and shewn to him by Dr. *Laurence* §; but Mr. *Morgagni* has set this matter to rights by observing, that it was nothing more than the *Membrana pupillaris* ||; which not being sufficiently known at that time, was taken for a preternatural and diseased appearance.

† De Sedibus & Causis Morborum, Epist. 13. Art. 18.

§ Monita & Præcepta Medica, p. 181. || Epist. 63: Art. 11.

## S E C T. II.

*The various species of cataracts as mentioned by authors.*

**I**T may not, in the next place, be wholly unentertaining or unprofitable, to exhibit in one view, an account of the *several species of cataracts*, as they are named and described by the several authors who have wrote of them; more especially as their several characteristic marks may be of use, the better to distinguish the true and remediable cataract from others, and help the practitioner the better to judge of the chance he has for success from the *operation*.

The *simple true* mature cataract has been already considered at large, and the *membranous* is above taken notice of.

The *virgated* or *streaked cataract* of *St. Yves*\*, is that in which the opaque chrystal-

\* Cataractes barrées, p. 215. Vid. Sauv. p. 721.

line is intersected by one or more coloured lines, however disposed; this species seldom bears a chrystalline so mature as that it can be depressed with a needle; for the chrystalline lens being pierced through, it pours out a yellow or whitish mucus, with which the aqueus humour is made turbid; from whence the sight remains obscure, unless that mucus sinks of its own accord; or by a reiterated operation, is thrown down by the needle.

The *purulent cataract* of *Maitre Jan* is that which is produced by a suppuration within-side the proper substance of the chrystalline, or between its superficies and the membrane which envelops it †. Pain in that eye precedes the suppuration, sometimes with an external ophthalmy and a frontal hemicrania; a mistiness of the chrystalline comes on; when the pus is formed the pain ceases;

† *Maitre Jan, des Maladies de l'Œil, p. 245.*

the chryſtalline grows white, ſwells unequally, although the bulk is leſs; the watery humour is made turbid by the effuſion of the pus; the colour of the iris is changed; the pupil is much narrowed, and the ſight much obſcured\*.

Mr. *Platner* alſo obſerves, that pus is ſometimes formed from an inflammation of the coat of the chryſtalline, between that coat and the lens; which kind of cataract, when the humour is found confined within this covering, is called a *cystic* cataract; by others a *purulent*; by others, becauſe that humour was like the cream of milk, a *milky* one; ſometimes alſo the lens itſelf ſeems to liquefy, and to be turned into a like humour †; ſometimes it is found ſolid but contracted, opaque and otherwiſe coloured, and is comprehended in that corrupted hu-

\* Sauv. p. 721.

† Platner, p. 768.



mour †; this and the foregoing of *M. Jan*, seem to be one and the same species.

The covering of the lens or the *arachnoid* coat is vitiated, if it breaks on a sudden, so that sometimes the lens, which must also be necessarily corrupted, passes into the antierior chamber of the Eye, which is between the cornea and the uvea; this usually happens from a violent blow\*.

Another vitiated state of the chrystalline besides those mentioned, is, if that *with its covering* is much, and in such manner tumefied, as that the other parts of the eye are compressed by it; this is known by the following marks, a hard eye resisting to the finger, swelled and more prominent than is naturally usual to it; there is a certain sensation of weight and pain in it; that which is opposed to view within the eye, hath the colour of the sea: At length,

† Platner, p. 769.

\* Id. p. 767.

if the disease hath been of long standing, the pupil is dilated, and a mydriasis comes on; but because both the vitreous humour and the retina are pressed by the lens, which is much swelled, the faculty of seeing entirely perishes, and a gutta serena takes place; they call this disease a *glaucoma*.

But there is another kind of *glaucoma*, viz. if the *vitreous humour swells up* §, is corrupted and becomes obscure; this however is much more frequently dissolved, and the darkened eye becomes concave and flaccid, making no resistance against pressure. But it follows of course, that if the vitreous humour be corrupted, the lens must also be vitiated †.

The *silver cataract* (*cataracta argyrias Maucharti*) is that in which there is only a small spot, shining like silver, above the chrySTALLINE, thought by *St. Yves* to be oc-

§ Platner, p. 769.

† Id. p. 770.

caused by a partial and little abscess in the superficies of the chrySTALLINE; however, that white spot sometimes perseveres throughout life, and only but a little obscures the sight; the patient, wheresoever he turns his eye, sees a shadow or little cloud spread upon the objects, as *Maitre Jan* says ||.

The *luxated cataract* is that which depends upon an opaque chrySTALLINE, but moved from its native seat; it is known, first, from the cause, viz. a blow upon the eye, with an effusion of cruor; secondly, from the immobility of the pupil, and a great mydriasis or dilated pupil; thirdly, from the chrySTALLINE growing white, and by pressing on the uvea, thrusting it outwards; fourthly, that lens afterwards dries up and decreases, and then the patient discerns the shadow of

|| Sauv. p. 721-2. M. Jan des Taches du ChrySTALLIN.  
p. 276-7. St. Yves de l'abcès superficiel du ChrySTALLIN.  
p. 245.

bodies interposed between the light and the eye †. Mr. St. Yves gives three different situations to these cataracts; the first is, when being detached by a blow, it advances towards the pupil, in this case it dries up before it touches the iris; the second, when the displaced chrystalline advances into the pupil, and attaches itself there; the third, when it passes into the anteriopur chamber, and places itself between the transparent cornea and the iris.

The *shaking cataract* (*Synchyfis Maucharti Cataracte Branlante* of M. Jan\*.) This is an abolition of the sight, with a white or a yellow spot, from an opaque chrystalline, and at the same time moveable, on any motion of the head; that chrystalline is diminished in its bulk and is indurated: this

† Sauv. p. 722. St. Yves de la Cataracte, par des coups. p. 195-6. 208. M. Jan, de Deplacement force du Chrystallin, p. 271. \* Id. p. 236.

evil proceeds from a dissolution of the vitreous humour, into a yellowish putrid ferum; it is preceded by an internal ophthalmia, which has ended in a suppuration, with dreadful pains; and then at first the pupil grows whitish; sometimes the dissolution becomes putredinous, but without pus; at first the pain is at the bottom of the eye, and in the antierour part of the head; after this the sight becomes obscure, or is entirely lost; the chrystalline is disturbed, turns white and yellow; the pupil is dilated; the iris loses its native colour, is corrugated, and adhering with the chrystalline, the uvea is turned inwards or outwards: But this putredinous dissolution is an incurable evil, taking away the sight, but occasioning no other mischief to the eye\*. Mr. *St. Yves's* description of this species of cataracts, agrees with M. *Jan*, but his opinion as to the

\* Sauv. p. 722.

cause of it is different: The chryſtalline, ſays he, goes from ſide to ſide according to the different motions of the eye, becauſe it is as yet attached to ſome ciliary fibres, which keep it ſuſpended in the middle of the poſterior chamber. By ſucceſſion of time theſe fibres break; then it is, that the body of the chryſtalline having no attachment to ſtop it, paſſes, upon the leaſt ſhaking, into the anterior chamber of the eye\*.

The cataract called *Antiglaucoma*, differs from a *true cataract*, firſt, becauſe in a cataract the anterior part of the capſule is moſt commonly diſſolved by a ſort of ſuppuration; in an *antiglaucoma*, it is indurated and thickened; ſecondly, in the true cataract the chryſtalline diminifhes in its bulk, but in an *antiglaucoma*, its ſize

\* St. Yves, p. 202. De la Cataracte branlante.

is augmented; thirdly, the additional substances which happen to a *true cataract*, give way and float in the aqueous humour, which enables one to separate the chrystalline from its natural place; but in *this*, the humour which congeals round about the chrystalline, forms a solid body with it, and attaches it to the membranes, which shut it in, and from whence it becomes impossible to separate it ||.

It differs also from a *Glaucoma*, in as much as, first, the bulk of the chrystalline is enlarged, but which is lessened in a *glaucoma*; secondly, as the pupil is dilated; thirdly, because the chrystalline protuberates, and resembles the colour of a white horn, polished and shining, although its superficies is unequal; fourthly, because the orbit of the pupil is like the inequality of

|| M. Jan, de la Protuberance du Chrystallin. p. 232.

the chryſtalline; fifthly, at length there is no ſight, no contractility of the pupil; ſixthly, no pain hath preceded, or accompanies it, as precedes the beginning of a glaucoma †.

The cataract called *glaucoma* of *M. Jan* and *St. Yves* differs from the true cataract, according to *St. Yves*, only as a glaucoma is attended with a gutta ſerena: It is a dried up cataract, or it is known, firſt, by exhibiting a bluish or ſea-green colour; ſecondly, by its leſſer ſize; by having loſt its transparency; by being encreaſed in hardneſs, and by the entire loſs of ſight, according to *St. Yves*; thirdly, it is ſeldom preceded by pains, unleſs the cataract ariſes from an internal ophthalmy, or from a blow, which *St. Yves* thinks moſt frequently happens; fourthly, by a round pupil and of

† Sauv. p. 722. M. Jan loco citato.



its natural diameter: But according to *St. Yves* there is a mydriasis, or dilatation of of the pupil: fifthly, the sight at first is misty, as in the cataract, but the patient sees clearer from the greater canthus; sixthly, the chrystalline changes colour, being at first of a sea-green, but afterwards grey, pearl coloured, or greenish, yellow, or of a blackish yellow colour. This is an incurable disease, if combined with a gutta serena, or blindness from a palsy of the retina, as *St. Yves* thinks †.

But the *glaucoma*, as it is briefly described by *Mr. Heister*, is distinguished from a cataract by the clouded part of the eye being farther off, and deeper seated in the eye, and exhibiting a sea-green colour §. He says it arises from a cloudy and opaque vitreous humour, and therefore incurable by the hand\*.

† Sauv: p. 723.  
M. Jan, p. 222.

St. Yves, du Glaucome, p. 197.  
§ Heist. p. 596. \* Id. p. 602.

*The secondary cataract.* The cataracted chryſtalline being depressed, but the capſule of the chryſtalline not cleaned away, it happens, not unfrequently, eſpecially if the patient by his own want of care, or by that of the Surgeon, ſhould ſuffer under an internal ophthalmſy, that the portion of the capſule which adheres to the vitreous humour, grows opaque and white, in like manner as an ophthalmſy is wont to cauſe an opacity in the cornea, when the inflammation is external; it happens alſo, by reaſon of the mucus adhering to that capſule, and being dried, or collected together. But this ſecondary cataract does not happen when the chryſtalline hath been extracted in *Daviel's* method, and the capſule cleaned from its mucus; although an internal ophthalmſy often comes upon this operation  
being

being performed. The colour of this cataract is merely cloudy; its seat seems deep\*.

### S E C T. III.

#### *The causes of a cataract.*

**T**HE causes of a cataract are various. It may be owing to any thick and glutinous humour inspissated and stagnating in the chrySTALLINE; or to its most minute vessels being obstructed, pressed together and dried up, whence the chrySTALLINE loses its transparency and is clouded over ||; or it may owe its birth to a deficiency of that juice, which is naturally between the lens and its covering, and from which it receives nourishment; from which deficiency the chrySTALLINE becomes contracted, dried up and opaque †. For Mr. *Sauvage* ob-

\* Sauv. p. 723. Memoires de l'Academie royale de Chirurgie, Tom. 6. p. 39. Octavo Edit. || Heister, p. 598. † Platner, p. 766. Morgagni Adversar. Anatomic. 6. p. 90.

serves, that the chryſtalline lens is not ſo  
 cloſely wrapped up in its capſule, but that  
 it admits a drop or two of a clammy humour,  
 between the nucleus and the capſule, by the  
 intervention of which, that capſule can change  
 its figure, and become more convex, or  
 more plane, by the action of the *corona*  
*ciliaris*; which action ceaſing, perhaps the  
 elasticity of the capſule exerts itſelf, in  
 contiliating a ſphærical figure to the lens;  
 and in fact, upon the extraction of the  
 cataracted chryſtalline, this ſphærical figure  
 is often obſerved\*.

This deficiency happens to ſuch, beyond  
 all others, who read or write night and  
 day; or who execute any other work  
 which requires a ſtretch of the eyes; for  
 whilſt the ſtraight muſcles of the eye are  
 powerfully drawn (which is neceſſarily oc-

\* Sauv. p. 719-20.

caused when we would look earnestly at, and examine things before and near to us with accuracy) the covering is pressed close to the lens, which hinders the secretion of that juice from the covering; and when the lens is deprived of its nourishment, it becomes vitiated ||: It may, otherwise, be owing to defluxions from the head and eyes †; to immoderate weeping\*; to vexatious and tedious catarrhs; to dry nostrils, not used to void their mucus, especially to such who neglect to give any attention to promote that secretion, by the use of their pocket handkerchiefs; for as much as that pituita, which cannot find its way through the nostrils, may, sometimes, be turned into the eye. But a cataract is more especially apt to happen, when a violent inflammation infests the eye, arising either spontaneously

|| Platner, p. 766-7. † Heister, p. 598. \* Fabricius Hildanus, Observat. Chirurgic. Centur. 4. Observ. 15.

From crude and corrupted humours of the body \*; or from some external violence, such as a fall, a blow, or a burn. There have been not a few, who have brought on themselves a cataract, by frequent inspection of the sun, or looking at a fire ||.

#### S E C T. IV.

*Of those cataracts which more readily admit of relief.*

**T**HAT sort of cataract in which the chrystalline lens only is affected, may now and then (if attended to upon its first appearance) be averted by a course of diet and proper medicines; and moreover may be remedied by the hand, when it is already come to maturity. The colour itself of the cataract, when formed, gives hopes

\* Platner, p. 767-8. || Heister, p. 598.

of successful cure by the operation, when of a whitish blue, or greyish colour, or even if a very little turning to yellow\* : Also if the eye be neither too hard nor too soft; and if there be some sense of light left to it, though no perception of colours; so that in the dark, the pupil is somewhat dilated, and in the light contracted §. Moreover, if the pupil does not cohere with the cataract †. Also if it be ripe, when it shall be found to have acquired some degree, not too much, of hardness; and when the pupil having entirely lost its natural blackness, is equally every where clouded over, but however yet moveable, when stroaked with the fingers, and the patient retains some degree of perception of light and darkness ‡, by

\* Platner, p. 770. Heister, p. 600. § Platner, p. 770. Heister, p. 600-1. † Heister, p. 599. ‡ Heister, p. 599.

means of a few rays which enter the eye between the iris and cataract ||. See Plate I. Fig. 3.

## S E C T. V.

*Of doubtful, dangerous or irremediable cataracts.*

**A**LTHOUGH cataracts of all colours have been known now and then to be happily removed, yet by the consent of all writers, there is a real difference in regard to the habit and nature of cataracts, and the prognostic to be made from their different colours, in relation to their cure: And it is pretty generally agreed, that by how much the more a cataract departs from an ashy or pearl colour, by so much the more dubious and uncertain the event of the operation (by depression) is like to be\*. That

¶ Warner's Description of the Human Eye, p. 80.

\* Heister, p. 600.



cataract is scarcely remediable, which hath a colour like gold, brass, or polished iron || .

*A variegated or party coloured* cataract, in which one or more coloured streaks appear intersecting one another, is very difficultly depressed by the needle, being too soft, and not every where equally hard; and the chrystalline being pierced, pours out a whitish or yellow mucus, which renders the watry humour turbid, by which the sight is left obscure\* ; therefore it is safer to wait until it becomes mature.

*Milky and purulent* cataracts, produced by a suppuration within side the chrystalline, renders the cure very doubtful, as a thick matter also mixes itself during the operation, with the aqueous humour, but they are not wholly to be despaired of § :

|| Platner, p. 770. \* Heister, p. 600-1. This is the Cataracte barrée of St. Yves, p. 215. Virgated Species of Sauvages, p. 721. § Called the Cystic Cataract, Platner, p. 768.

That kind of cataract, in which, not only the lens, but also its covering and sometimes, together with that coat, in which the bed of the vitreous humour is wrapped, have contracted a diseased affection, is of a worse nature and more difficult to be restored, than where the lens only is vitiated, because they all require to be depressed with the needle\*, in order to a perfect cure.

The disease is of a doubtful nature when attended with vehement pains in the head; or if the eye be either wasted, or grown larger than it naturally was; or if the patient be weak, or very far advanced in years||; or if in the infant state, as these last are wont to be wayward and impatient of pain §.

\* Platner, p. 770.    § Heister, p. 601. Platner, p. 768.    ¶ Heister, p. 600. Platner, p. 771.

If there be a bad habit of body with vitious humours, it creates a danger of some bad disease, and of an unsuccessful cure †; they also are in a dangerous condition, who have been cured of the Lues Venerea by mercury; and those troubled with other pernicious diseases of the head, and beyond every thing, violent pain in it; nor less those whose bodies are weak, rare, and fat, and who have rendered it inert, and relaxed by sloth, sleep, luxury, or venery; or those who come from a healthy into an unwholesome place; or who remove suddenly into the cold whilst the body is relaxed with heat\*.

Nor is there much hope to be entertained, if the cataract owes its rise to a formidable and long distemper, or to a violent blow, and inflammation of the eye; nor are there

† Platner, p. 771.      \* Id. p. 768.

any, or but very little hopes for those, who without this disease, and before any appearance of a cataract, have laboured under a dullness of sight, in whom, for the most part, a gutta serena comes on.

The event is much to be feared, where the pupil, having lost its natural or circular figure, changes itself into another\*, and appears broken, irregular, misshapen, and comprehended in angles, or too much pressed together ||; if it be much spread out and immoveable, and has no perception of the flashes of lightening §; for certainly, if the patient is no longer able to discern either light or darkness, it points out some great mischief, either in the retina, or optic nerve, that is, there is a gutta serena at the bottom, and therefore no relief can be expected.

\* Platner, p. 770. || Heister, p. 600. § Platner, loc. citat.

The operation is difficult and hazardous, if the pupil be glued to the cataract, and rendered stiff, which may be supposed to be the case, when it is neither constricted by a strong light, or dilated in a weaker, or in a dark place, but keeps constantly the same amplitude; also if after being rubbed with the fingers, it is little or nothing moved by it\*.

There is a sort of cataract which admits of no relief, viz. when the cataract appears to be in its place, but, which being as it were in a tremulous state, is always slipping, especially on the least motion of the head; this happens if the ciliary processes, which cohere with the covering of the lens, have been in any part broke away, and drawn from the ciliary ligament||.

\* Heister, p. 599.  
p. 779.

|| Idem, p. 598. Platner,

There is also another kind, which not only slips, but is so moved here and there, as that the opaque lens, such as is usual in a cataract, is now seen opposite to the pupil, then as it were, vanishes again; the eye is concave, and without hardness; but the pupil is diffuse, and hath lost its natural figure: This kind of malady happens, when the vitreous humour is in a state of liquefaction, in which the withered lens swims, nor is this by any art to be got rid of\*.

Lastly, If the cataract be unripe, the operation is altogether improper and mischievous; this may be conjectured, more especially from hence, viz. if the pupil is not yet found to be equally every where opaque;

\* Platner, p. 779-80. The Cataracte branlante of M. Jan, p. 241. and of St. Yves, p. 201. The Shaking Cataract of Taylor, see Heister, p. 615. Cataracta a Synchyfi of Mauchart, see Sauv. p. 722.

also if any power of sight remains, most of all with the back turned to the light ||.

## S E C T. VI.

*Of the methods recommended for administering relief to persons suffering under this disease.*

**T**HESSE may be considered as either physical or chirurgical.

As to the first of these, that some have been freed from cataracts, undertaken early, nor yet far advanced, has been observed by ancient and modern writers\*; *Celsus* asserts that it is sometimes, when taken in the beginning, got rid of by certain observations as to diet and medicinal applications, several of which he specifies, as will be seen

|| Heister, p. 599. \* Id. p. 602. Boerhave de Morb. Ocul. part 2. cap. 3. Fabric ab Aquapendente, p. 212-13. Riverius, Prax. Med. lib. 2. cap. 4.

in what follows §. A cataract begins, says *Kennedy*, with violent shooting pains in the bottom of the orbit and forehead, which seem to be something of the nature of the rheumatism; the humour falling upon the eye, the sight begins from thence to diminish: Rheumatic pains, and rheumatic obstructions are removed from other parts of the body by medicinal particles conveyed in the long round of circulation, and why not here? no new ways or laws of conveyance are required, than what are common to the conveyance of all medicines, in all sicknesses, and of all foods, to preserve us alive and in health †. And though it should not be occasioned by a viscous, tenacious, or glutinous humour, gathered together in the *aqueous humour* of the eye, where by length

§ Celsus, lib. 6. cap. 6. p. 367. † Kennedy, Ophthalmographia, p. 81. See also M. Jan. p. 142-3.



of time these slimy fibres are compacted and hardened into a pellicle, according to *Kennedy*, some such slimy particles and fibres may happen to fall upon the *chrySTALLINE* and its coats: Nobody ever denied the existence of such humours, such concretions, and such obstructions, nor of the possibility of removing them, except in this case; and why it should be excepted I know not\*. *Dr. Pitcairn* seems to intimate, that the removal of this disease ought not to be thought impossible, as he thinks no disease should; and he further says, that the method to be used is the same with that directed for the gutta serena ||. *Dr. Buchan* also says, that in a recent or beginning cataract, the same medicines are to be used as in the gutta serena; and that they will sometimes succeed: He also affirms, that he has himself resolved

\* *Kennedy*, p. 75.  
p. 144-142.

|| *Elementa Medicinæ*,

a recent cataract, by giving the patient frequent purges with calomel, keeping a poultice of fresh hemlock constantly upon the eye, and a perpetual blister upon the neck §. As soon as ever, says Mr. *Platner*, the eyes are perceived to be dull and misty, or to have any suspicious appearance in the look of them, so as to create fear of a cataract, help should be immediately sought for, both from diet and medicine. But, in the first place, all such persons should be admonished to spare their eyes as much as possible, and never to strain them by writing, or reading, or by any kind of work; but to abstain from every employment which demands a fixt or steadfast exertion of the sight †; they should keep a veil over the diseased eye, and carefully shun a bright light. To the foregoing authorities let me add what a writer of the

§ Domestic Medicine. p. 590. † Platner, p. 771.

present time asserts, viz. that an infant cataract is susceptible of being remedied by an aromatic spirituous composition, the strength of which, must be proportioned to the degree of the malady: In its two latter states he acknowledges that no resource is left but the operation, and that only practicable in its state of maturity †. *Boerhave* also recommends, as the best topical application, the vapour of some mild spirit conveyed to the eye\*.

But in order to succeed, a strict attention had to the preservation and well being of nature's œconomy, in regard to all her necessities, is of the greatest importance, viz. that the bowels discharge their fœces duly and daily; that the courses of women return regularly, and in a proper degree;

† Chalibert on the gutta serena. \* De Morb. Ocul. part 2. cap. 3.

that such as are subject to the bleeding piles be careful that they be not suppressed, inasmuch as a weakness of the eyes, a cataract, and glaucoma often arises from these circumstances\*.

If the habit be plethoric † from the abundance of blood, a vein should be opened, and cupping glasses applied; and in case the eye be inflamed, blood should be drawn from the jugular vein, nay, if necessity requires from the artery; or according to *Celsus* from the forehead or nostrils ||. On the contrary, if after a great loss of blood, the eyes should become dull, and occasion a fear for their recovery, broths should be administered, with aperient roots and herbs boiled in them ‡, or milky foods or eggs.

The diet should consist of meats easy of digestion, and such as possess an attenuat-

\* Platner loc. citat.

† Pitcairn Elem. Med. p. 142.

|| Celsus loc. citat.

‡ Platner, p. 772.

ing quality, or as *Celsus* expresses it, such as extenuate the pituita \*, forbearing to meddle with such as are salted and hard, which are apt to create obdurate excrements and costiveness: Gelatinous, farinaceous and leguminose foods, beans especially, and even peas, (more especially in soups or puddings) except when very young and juicy; and all unfermented and doughy substances; these should be avoided, as tending to generate pituita and flatus. And as the general intention is, to dissolve the thickness and tenacity of the lymph, and to give it a greater fluxility, to subtilize and attenuate the humours, ptizans and sweet whey should make a part of the daily administrations †.

Medicinal prescriptions should be also calculated upon the same principles; more espe-

\* *Celsus*, loc. cit. † *Sauvage*, p. 720.

cially if the habit of the body be naturally phlegmatic, in which case, those things should be directed, which have something of a specific tendency, either to attenuate, discharge, or expel it out of the body; such as, according to *Celsus*, gargarisms †, to unload the mucous glands about the mouth, throat or aspera arteria; as also such cathartics as best tend to carry it off from the stomach and bowels. *Plempius* says, that a cataract in its beginning may be cured by universal evacuation, local remedies, and such others as tend to digest and dissipate the peccant matters already existing in the eye; but he says all depends on taking it in the beginning ||.

*M. Jan* mentions also masticatories, and sternutatories in order to free the brain and carry off the humor which causes the ca-

† *Celsus*, loc. cit.    || *Plemp.* Ophthalmogr. p. 228.

taract. Boerhave recommends a mercurial sternutatory \*. Diuretics are likewise useful, and also as a specific in this case, the juice of live millepedes †. *Sauvage* extols the white *benbane* as specific in this case §. The old physicians had a high opinion in such disorders of the *eyebright* particularly, likewise of the *fennel*, the *celandine*, the *betony*, the

\* Boerhave, loc. cit. † Platner, p. 772.

§ Usus Extracti Hyoscyami albi quotidianus, a triente grano incipiendo, & sensim augendo, quamdiu nulla est œsophagi nariumve siccitas, est egregium & ferme unicum remedium quod cataractum resolvat, ut pluribus observationibus compertum habeo. Presbyter ea affectus in oculo dextro, post octo dies quibus hoc medicamine usus est, quo intervallo, ad tria grana pervenit, jam minutos librorum characteres legere valet, qui prius non nisi maximos perspiciebat; chrySTALLINUS, prius albus, jam subcœruleus evasit & subpellucidus, suffusio myodes qua laborabat evanuit, fames autem & somnus, prius languentes, vigent maxime. Ab hoc medicamine alium vidimus a *D. Coulas* etiam curatum, cujus chrySTALLINUS omnio diaphanus evasit. *Sauvages*, Tom. I. p. 724.

*vervain,*

*vervain*; as also of the spices, in decoctions, infusions, syrups, electaries, &c. †

Perpetual blisters are moreover thought by some, to be of use, especially if the body be loaded with pituitous humours; or to open an issue in the arm, or which hath the greatest efficacy, a seton in the neck; by such means to open a passage, and give vent to the noxious humour. *Celsus* recommends fumigations and anointing the eyes with acrid medicaments\*.

If there be a venereal taint in the humours, diet drinks and mercurials proper to cleanse and alter the vitiated state of the humours, should be administered ||.

If the dim eye be swelled and hard, it is not amiss to use emollient fomentations,

† *Plemp. Ophthalm. p. 228. Aquapendente, p. 213. Hildanus, Cent. 1. Observ. 24. p. 400-1.*

\* *Celsus, loc. citat. || Platner, p. 772.*



by which, if towards the end, the tumor and hardness appear to be lessened, discutients should be then applied, as the disease, with the help of the internal remedies mentioned to expel the noxious humours, is often removed by them; but without those remedies fomentations may be of pernicious consequence\*.

Should all these mentioned attempts to prevent the cataract threatened, or to remove it when in the incipient state, fail, recourse must be then had to the hand and knife.

## S E C T. VII.

### *Of the chirurgical helps.*

**T**HERE are two operations in use among the surgeons, for removing a cataract;

\* Platner, p. 773.

the one is by couching or depressing it; the other by extraction, or taking the diseased chrystalline quite out of the eye. Mr. *Sauvage's* brief account of one and the other, is as follows.

### S E C T. VIII.

*Of couching or depressing the cataract.*

**T**HE depression of the chrystalline, says Mr. *Sauvage*, is performed by means of the tip of a two edged needle, introduced near to the temporal canthus, one line from the cornea, behind the uvea; by means of which the chrystalline lens is acted upon from above, and afterwards both the chrystalline and the capsule are pressed down, and hid in the lowest part of the vitreous humour, which being done, the patient is committed to his bed, and confined there

for

for nine days, both eyes being covered with a bandage about them.

## S E C T. IX.

*Of the operation by extraction.*

**T**HE extraction of the chryftalline and capsule, is executed by an incision into the cornea, beginning at the lower part and carrying it on three quarters round, which is done by the help of curve sciffors, the incision being first made with a launcet; in the mean while, the eye is to be kept fixed, by putting the speculum under the eyelids. The incision being made, the eye is gently pressed, and the chryftalline almost immediately, offers itself at the aperture; or if the cataract be found not to have acquired maturity, it is to be drawn out by the help of the instrument commonly called

*a curette,*

a *curette*, and the fragments of the capsule, and the mucous flocci slipped out from the broken capsule, are drawn out, one after another.

### S E C T. X.

#### *Remarks on both.*

**I**N practising the first method, it is necessary to wait till the cataract is perfect, or mature, as it is to be feared, lest the chrystalline should rise again, or rather, lest the opake mucus of the capsule should remain and bring on the cataract anew.

In the other method it is to be apprehended, lest by a too strong pressure upon the eye, the vitreous humour should also break its way out with the aqueous; and lest the choroid be greatly inflamed, perhaps because whilst the chrystalline lens  
 passes

passes through the hole of the pupil, or is drawn out with the curette, the uvea and corona ciliaris are drawn asunder from one another; which ophthalmy, when it happens, perseveres for fifteen or twenty days, and then being subdued, a wonderful suffusion, but fugitive, happens; the patient seeming to himself to see all objects, as though they were sprinkled with snow, and as it were a black bird in the middle\*.

Thus far Mr. *Sauvage*.

After either of these operations, it will be necessary for the patient to make use of a double convex glass, to supply the place of the chrystalline lens; or otherwise the rays of light will not be sufficiently refracted, so as to convene at the retina, but beyond it, from whence vision will be confused and indistinct.

\* Sauvage, p. 720-21.

Before I give a more particular relation of performing the above mentioned operations, it is necessary to premise the provisional care and cautions recommended to be used beforehand, in order to prevent future ill consequences, and as far as may be in our power, the better to ensure success to the operation.

## S E C T. XI.

*Observations necessary to precede the operation.*

**W**HEN the operation is resolved on, an interval should be selected for performing it, when neither the bleeding piles or menses are present; there is equal reason for waiting, if there be a defluxion on the nostrils, fauces or lungs, with frequent coughing, haulking, or sneezing\*,

\* Platner, p. 773.

causing pain in the head, or feverishness; and the operator himself should be in good health, and endued with a clear and acute sight, and a strong and stable hand.

The fittest time for performing it, is, either in the Spring or the Autumn, before the heats come on, or when they are nearly gone\*, when the weather is most temperate, and moderately warm || . The Day should be serene, with an open sky, not cloudy or foggy § . The Hour, for the most part chosen, is sometime before noon, not that the afternoon is improper, nay, sometimes it is to be preferred, for this reason more especially, as timid persons are not so liable to faint after a moderate dinner, as they would be if fasting; which should it happen, when under the operation, would be pernicious † . The Chamber should be

\* Platner, p. 773. and M. Jan, p. 172.    || Heister, p. 603.    § Platner, p. 774.    † Heister, p. 604.

lightsome, that the surgeon may be able to discern the instrument when in the eye of the patient, but not too much light or sunshine \* ; for whenever the eye is illuminated with a stronger light than ordinary, the pupil immediately constricts itself, and thus hinders the surgeon from an accurate sight and observation of the needle, and of any other obvious thing, that might happen to be within side the eye || .

For some days before the operation, a spare and thin diet should be prescribed the patient for his nourishment, and water, or ptizan, or some other of the weakest kind of beverage §, for his common drink : *Celsus* advises a total abstinence the day preceding the operation ; also the bowels should, now and then, be moved for stools, all which

\* Platner, p. 776.    || Heister, p. 604.    § Platner, p. 774.



contribute to avert inflammation, which sometimes there is reason to be apprehensive of\*; a little blood taken away, may also be proper to guard against it||, and thereby prevent any further mischiefs, such as very sharp pains, nay even a suppuration and destruction of the whole eye, as sometimes has ensued the operation §. The evening before the day of the operation, a solutive glyster should be thrown up, least an urgency to stool should oblige the patient to rise from his bed †; and more especially if he be in the least degree costive.

Lastly, to prevent the patient from fainting whilst under the operation (if it is to be performed in the morning) and consequently the difficulty or most pernicious impediment, which the surgeon would find in exe-

\* Platner, p. 774.    || Heister, loc. citat.    § Id. ibid.

† Platner, p. 774.

cuting the business he has undertaken, it seems not amiss, that something of food, or certainly some strengthening spoon meat or broth, should be given him prior to the operation \*.

Some medicament ought to be in readiness, to prevent or stop inflammation; the best, according to Mr. *Platner*, is that which is compounded of burnt *Allum*, *Sacchar. Saturni*, or *Tutty*, which are to be mixed with the white of an egg, and then adding some rose water, they are to be stirred about and intimately mixed together; a compress dipped in this liquor, and the liquor somewhat squeezed out, is a proper application; and it would be right if this medicament were also to be put upon the sound eye, and kept tight by a bandage, immediately before the operation †.

Nor

\* Heister, p. 604.

† Platner, p. 776. Brandy and water is the simplest  
and

Nor is there scarcely any thing of so much use, as to be prepared with an *anodyne draught*, in order to procure some sound sleep, not long after the operation is finished; for by means of it, the powers both of body and mind are strengthened and refreshed, nor will the suppressed cataract be so apt to rise again ||.

and most common of all the collyria, the proportions of which, according to M. Jan, are, one part brandy and ten of fair water. Another very common one is 20 or 30 grains of Rhase's white troches, and two ounces of rose water, used by M. Jan after the operation, by means of a compress dipped in it and squeezed out. Mr. Heister's receipt is,  $\mathcal{R}$  Albuminis ovi unius, Aq. Plantaginis,  $\mathcal{Z}$ iiis Aluminis pulv.  $\mathcal{S}$ ss Lap. Tutia $\mathcal{e}$  pp.  $\mathcal{S}$ i adde paululum Camphora $\mathcal{e}$ , M. & habeatur in promptu.

¶ Heister, p. 604.

## S E C T. XII.

*The manner of couching or depressing a cataract.*

**W**HEN all things are prepared, disposed in order, and in readiness for the operation, viz. soft linnen compresses; bandage, spare linnen, as may be wanted, and a proper collyrium §; the patient should be seated not over against the illuminated part of the room, but so placed, as that the light may come sideways to his eye; the surgeon should sit in a seat opposite him, but raised a little higher\*. Immediately behind the patient should be placed an assistant, who should support the head, and incline it a little forwards, by pressing gently against the back part of the patient's head, with his breast alone, or by the assistance of a pillow placed betwixt the assistant's

§ Heister, p. 606.

\* Platner, p. 766.

breast and the patient's head ||. Moreover two other persons are to be placed, one on each side of the patient, who are not to suffer him to stir, or shrink, as by a slight movement, he might be deprived of sight forever: And on this account also, linnen compresses should be put and bound on the other eye †.

The patient is to be ordered to open his eyelids as wide as he can, and to turn his eye towards his nose, so that the lesser canthus, or that next the temple, may shew a sufficiently large part of the white of the eye\*; he should be admonished to keep his eye motionless; and Mr. *Platner* recommends, gently rubbing the eyelids, to the end that the smaller veins being inflated, may better shew themselves, and so not be injured by the instrument †.

|| Warner, *Descr. of the Hum. Eye*, p. 93. † Platner, *loc. citat.* \* Heister, p. 606. † Platner, p. 766.

## S E C T. XIII.

*Of the instrument.*

**T**HE instrument to be used for this business, is a two edged needle, not being too acute, nor too thin; for if it be too acute, the lesser arteries and veins in the uvea and ciliary processes may be hurt; but if it be too retuse, it is more difficult to be introduced, and not without pressing it on; the best seems to be that, whose point is a very little diminished, rather broad, but not too sharp; it should have a small handle, and on that a mark, so that when the needle is introduced, it may be known, in which part the plane side is, and in which the attenuated or edged\*.

See Plate I. Fig. 3.

\* Heister, p. 774.

The needle may be made of steel, sufficiently hardened, but not too brittle; but Mr. *Platner* thinks, that which is made of gold, hardened by often repeated strokes of the hammer, is rather better: If it be of steel, great care ought to be taken, that it be free from rust; and for that purpose, it should be passed through thick flannel, usually of a purple colour, and by rubbing it with this, it may be rendered perfectly smooth; also before it is introduced, it should be drawn through the lips moistened with saliva ||, or warmed by dipping it in hot water §.

|| *Platner*, p. 775. § *Warner's Description*, p. 94.

## S E C T. XIV.

*Of the operation, how performed.*

**T**HE surgeon ought to use his right hand, in operating on the left eye, and his left hand, in performing it on the right eye §. But, if a cataract of the right eye is to be couched, and the surgeon cannot use his left hand so dextrously as his right, he may place himself behind the patient, and use his right hand \*. If the left eye be in fault, the surgeon is, with the finger and thumb of his left hand, and with celerity, to separate the eyelids, and keep the eye steadfast and immoveable ||; (Others teach, that the assistant, who stands behind the patient, should lift up the superior eyelid, and the operator himself de-

§ Platner, p. 776.

\* Sharp's Operations, p. 165.

|| Heister, p. 606.



press the inferior †) and with the other hand, to advance the needle †, which he is to hold with his fore finger, middle finger and thumb of his right hand, in the same manner as a pen is held in writing; so that he may lean his little finger and that next to it, upon the patient's temple and the angle of the eye near to it \*. Mr. *Heister's* direction is, to place those two lower fingers on the cheek, so as that it may not easily tremble, but may rest more firm and stable during the operation, than if it was entirely at liberty ||.

And now the needle is to be prudently thrust into the white of the eye §, at a very small distance beyond the cornea ¶, through the coats into the posterious cham-

† Sharp, p. 164. Warner, p. 93. † Platner, p. 776. \* Id. p. 777. || Heister, p. 606.

§ Id. p. 607. ¶ Warner, p. 94.

ber\*, in such manner as that no vein be wounded. The exact place for the needle to be entered, as mentioned by Mr. *Platner* from Dr. *Petitt*, is that which is two lines distant from the cornea †; not nearer, lest the ciliary processes should be injured; nor farther off, lest the aponeurosis of the abducent muscle should be hurt ‡: Mr. *Heister* directs it to be over against the middle of the cataract ||. In thus introducing the needle through the five coats, the conjunctive, albuginea, sclerotica, choroid, and retina, it will be right to do it with the flat surfaces of the instrument looking upwards and downwards; since by this method less violence will be done to the coats of the eye, than if the blade of the instrument had penetrated the eye in a transverse direction §.

\* Sharp, p. 164. † Platner, p. 777. ‡ Ibid. in a note. || Heister, p. 607. § Warner, p. 95.

As soon as it is known that the needle has penetrated through the coats, into the eye, from hence, that there is no farther resistance upon pressing on the needle, the needle must then be cautiously pushed forwards, 'till it appears behind the pupil, (which it will always do, when the eye remains transparent \*) and is to be immediately inclined towards the cataract †: When the needle has reached to the cataract, its handle should be so inclined, as that the point of the needle, and its plane part, may be moved to the upper surface of the cataract ‡, which should be depressed by gentle degrees, and brought down beneath the region of the pupil; when the cataract has got past this, the needle should be impressed on it with somewhat more force, that it may seat

\* Warner, p. 94. † Heister, p. 607. ‡ Platner, p. 777.

itself on the lower part, under the vitreous humour ||.

If the cataract should not readily submit to the depression, Mr. *Warner* directs the needle to be carefully moved underneath the cataract, and gently raised up, by which means the cataract may be separated from the processus ciliares, and from the aranea below; and at the same time be disengaged from the inferior portion of the iris, provided it be but slightly connected with it; after the cataract is thus lifted up, the position of the needle must be altered, and directed a little above the upper portion of the circle of the pupil, afterwards inclining the instrument downwards and obliquely outwards, taking care not to wound the iris, or processus ciliares; by these means, he says, the cataract will be so effectually dislodged

|| Platner, p. 777.

from the bed of the vitreous humour, and its nutrient vessels be so perfectly destroyed, as to bring on its gradual decay\*.

When the cataract descends with the instrument, which every now and then, when it is ripe and hard, happens with a single stroke, it should be kept down for some little time, that it may fix itself: When it is found, upon lifting up again the instrument, that the cataract abides beneath the pupil †, and the patient can see objects before the eye ‡, the cure is compleated, and the eyelids being immediately closed, the needle is to be carefully withdrawn, in a strait line, out of the eye. The eye is to be covered up least the new light should offend it.

\* Warner's Description, p. 95. † Heister, p. 607.

‡ Platner, p. 777.

## S E C T. XV.

*Of the accidents which may happen.*

**I**F the distempered part should rise up again, as often happens, it must be pressed down with somewhat more force, with the same needle, and kept down for a little longer time; and this must be repeated so often as, until when suppressed, it shall abide beneath the pupil\*.

When the cataract adheres somewhat more firmly, it is often very difficult to detach and depress it, whilst whole; therefore should this fall out to be the case, Mr. *Heister* says, it must be cut into pieces with the needle, each part of it afterwards being diligently buried beneath: The same must be done if the cataract, either, as it were

\* *Heister*, p. 607.

spontaneously, or by accident, whilst the surgeon is endeavouring to depress it, should burst asunder, or be broke\*.

If the cataract adheres so firmly to the uvea, as scarcely to be separated from it, it sometimes proves serviceable to perforate it in the middle, as by doing this, the rays may be able to enter through this hole into the bottom of the eye, by which, some sort of sight is sometimes restored to the patient, which probably will succeed best in that case, where the chrySTALLINE is very thin †.

Whensoever the cataract is found to be as yet much too soft, it is better, as *Briffæus* thinks, immediately to withdraw the needle out of the eye, and to defer the operation, until when the cataract shall be more ripened, than by working on an unripe

\* Heister, p. 608. † Idem, *ibid.*

cataract, to defeat the proposed end of the operation, and deprive the patient of sight forever\*.

If the aqueous humour should flow out in the operation, and therefore the cornea should fall, we need not be in much fear for the safety of the eye, for almost always that humour, and the pristine form of the eye return †.

If it should happen, that whilst under the operation, blood should flow out from a pricked artery or vein, into the eye, and render the aqueous humour turbid and cloudy, the operation should be hastened as much as prudent care will admit of, to the end that no more may break out; and the collyrium must be diligently applied, in order to prevent inflammation; for the danger will be still greater, if a large quantity of

\* Heister, p. 608. † Id. p. 611.



blood should mix with the aqueous humour, as then it can scarcely be avoided, but that an *hypopium*, or some other like mischief, will bring on a perpetual blindness: In the mean time, it will not be foreign to the purpose of preventing these disasters, to apply small bags prepared with *sage*, *rosemary*, *hyssop* and *fennel*, boiled in red wine, and pressed out from this decoction, and applied frequently upon the eye\*.

If on finishing the operation there should be any appearance of inflammation; if it should be but slight, the usual collyria may be sufficient to suppress it; but if it should happen to be more vehement, it will be moreover necessary to drink water instead of other liquors; to draw blood from the arm,

\* Heister, p. 611. also M. Jan, p. 194. St. Yves, p. 230. and Platner, p. 779. Kennedy describes particularly accidents of this kind, which happened to him without any ill consequence. Ophthalmographia, p. 91-3.

foot, or neck, and to repeat it; also to bathe the temples frequently with camphorated spirits of wine, and moreover to administer clysters, and to apply blisters, together with other internal means efficacious against inflammations\*.

## S E C T. XVI.

*Concerning what is to be done after the operation.*

**W**HEN the operation is finished, it is judged by the more prudent physicians, to be much more safe, to prevent the light from rushing vehemently into the eye, and creating an inflammation, than to expose it to these mischievous consequences, by holding up objects of any kind to their sight, in order to know the success of the operation, by enquiring of the patient if

\* Heister, p. 612.

he can tell what the object is, and of what colour, as is the bad custom of some itinerant oculists †.

Immediately after the operation, some cooling collyrium † should be applied, by means of compresses dipped in it, and kept on by a bandage || : The eyes being decently bound up, the patient should sit upright for some hours §, and then be laid on his bed, and be told to lie on his back \*, and by well supporting his head with pillows, be kept as upright as he can be with ease and convenience (a), as the most favourable posture for preventing the rising of the cataract (b).

Although one eye only should have been operated on, a bandage should be applied

† Heister, p. 609. † See p. 53. † Heister, p. 609. § Warner, p. 96. \* Platner, p. 778.  
(a) Heister, p. 609. (b) Id. *ibid.* and Warner, p. 96.

to both, least perchance the sound eye being moved or agitated, the other also, having already greatly suffered, should be agitated at the same time, which when it happens, occasions great risque of the cataract's re-ascending or returning, as also of an encreased inflammation, or some other yet greater mischief\*.

On the first day the compresses ought to be renewed every three hours; when they become dry, they are again to be wetted in the collyrium, that inflammation may be prevented or restrained †; and for the same purpose, it might be exceedingly useful and proper, if, some hours after the operation, a vein was to be opened, and as much blood to be taken away, as the habit and strength will permit ‡. A paregoric should be given in the evening, to procure a placid

\* Heister, p. 609. † Platner, p. 778. ‡ Heister, p. 610.

rest, and prevent the tossing about in bed, in a wakeful state; as the cataract by this jactation, might be driven up again\*.

On the following days the compresses, soaked in the collyrium, should be renewed, at least morning and evening; or even three or four times, or more in a day, especially if the heat or smarting should be rather intense; as in that case, the compresses sooner grow dry; but on loosening the bandage, great care should be taken to keep the weak eye from perceiving too bright a light, and any consequent mischief it might suffer from it †; for this reason also, the eyelids ought never to be opened before the seventh day, as an unusual light might disturb the eye, and cause the cataract to return: In the mean time, quiet and abstinence are necessary ‡.

\* Heister, p. 610.  
p. 778.

† Id. p. 611.

‡ Platner,

No other nourishment should be taken, for some days, than liquids, to prevent the jaws from being put in exercise \* ; the patient should therefore abstain from foods which require mastication, for the space of eight days, keeping close to his bed, and avoiding intense conversation, sneezing and laughing, until it is observed that the cataract is firmly seated at the bottom of the eye †.

If any inflammation should arise, the bleeding should be repeated, and the collyrium applied. Mr. *Warner* advises fomentations of warm milk, applied twice or thrice a day, by the help of a warm sponge, or a bit of fine rag, so long as any inflammation, pain, or stiffness of the eye remain ‡: Where the inflammation rages, and causes an exquisite tenderness and pungent

\* Platner, p. 778. Celsus, p. 434.  
p. 609. † Warner, p. 96.

† Heister,

pains in the eye, this must undoubtedly be preferable to cold or acrid applications; but in those of a slighter nature, and more external, may not these last mentioned, that is, the cooling collyriums, be more suitable and effectual \*? Nor is the use of other internal remedies, suited to take off inflammation to be neglected †. If the patient should be costive, an emollient glyster should be administered, nor should he be permitted to rise for the purpose of easing nature, but submit to the use of a bed pan, or some other convenient utensil ‡. When the inflammation and pain is considerable, attended with severe head aches, Mr. *Warner* advises purges, and if necessary, perpetual blisters to be applied behind the ears, or to the nape of the neck, or betwixt the shoulders,

\* See Hoffman, tom. 4. cap. 11. p. 525. † Heister, p. 610. ‡ Id. *ibid.*

and to be kept open as long as may be found necessary || .

If the eye should be attended with little or no inflammation, the bandage should be continued for the eight days, after which there will be very little danger of an inflammation arising; the patient may then rise from his bed, the bandage may be removed, and the eye be opened; but in an obscure place, and on first beginning to see, he should keep in a darkened room, the bed being shaded by curtains \*, with the window shutters almost closed, that the eye may be accustomed, by degrees, to the light †. The tenth day, if all things go on well, the patient may rise, leisurely, and walk about his chamber, without any danger, but with a veil hanging over the weak eye, made of green or black silk ‡, or a piece of lin-

|| Warner, p. 97. \* Heister, p. 611. † Platner, p. 778. ‡ Heister, p. 611.



nen cloth of a green or blue colour, according to *Platner* \*.

Towards the latter end of the time, linnen cloths pressed out of warm water, to which is added a little spirits of wine, may be used to the eye instead of the collyrium †.

If afterwards, things continue to be in good order, the operation may be considered as having succeeded as well as could be wished, and the patient may return by degrees to his usual way of living.

But should any considerable mischief supervene, the patient must keep his bed until he is relieved ‡.

It may happen that under this operation, the vitiated lens may have moved from its seat, and come through the pupil, into that place which is between the cornea and the

\* *Platner*, p. 778.  
p. 611.

† *Id. ibid.*

‡ *Heister*,

uvea ; in this case, the patient must be directed to lie on his back, and in darkness, by doing which, the lens may return again through the pupil, to its former seat ; which afterwards, by passing the needle into the eye, may be pressed down below the region of the pupil, and made to seat itself in the proper place ; but if it remains, and excites pain and inflammation, an incision must be forthwith made in the cornea, and the lens extracted through this wound, either with a forceps or a little hook \*.

It sometimes happens, that a vomiting comes on, an hour or two after the operation, or in the night following, probably from some nervous irritation ; which generally ceases of its own accord ; but it is an ill symptom, as the cataract, by the force of the vomiting, is apt to rise again † :

\* Platner, p. 779. † Heister, p. 610.

Opiates and the saline draughts have been found serviceable in this case\*.

If the eye should continue weak, and be attended with a more than common secretion of tears, after the pain and inflammation are removed, cold spring water is recommended, or rose water, with a fourth part of brandy, or hungary or lavender water, or a solution of *Sacchar. Saturni*, or the *pulv. e ceruss. comp.* in rose water †, or the *aluminous* collyrium, prescribed both by *Heister* and *Platner* ‡.

After this mode of operating by depression, the cataract is liable to rise again; but however this is a case not altogether to be despaired of, as by a repeated operation, it may sometimes be again suppressed, and the sight again restored; nay, it happens now and then, that the cataract re-

\* Warner, p. 96. † Id. p. 96-7. ‡ See p. 53-4.

ascends and subsides shortly after, of its own accord\*. Mr. *Warner* says, the most effectual means of preventing the cataract's resuming its original situation, after it has once been depressed, is to destroy as effectually as possible, the aranea, by moving the instrument in different directions, provided the cataract has not readily submitted to pressure †.

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### EXPLANATION OF PLATE I.

This plate contains the human eye and two couching needles, as represented by Mr. *Warner*; also a figure, shewing the manner in which a cataract obstructs the passage of the light, taken from Mr. *Cbeselden's* anatomy.

Fig. 1.

A. The couching needle

\* Heister, p. 609-10. M. Jan, p. 119-20. 191.  
203-11. Warner, p. 87-8. 108. † Warner, p. 108.

Fig. 2.

Fig. 2.

B. The couching needle passed into the eye, with its blade lying on the cataract.

C. The eye.

D. The *cornea*.

E. The anterior chamber of the eye.

F. The *iris*.

G. G. The posterior chamber of the eye.

H. H. The *processus ciliares*, or posterior *lamina* of the *iris*.

I. The *chrystalline* lens or humour.

1 The *sclerotica*.

2 The external *lamina* of the *choroides*.

3 The internal *lamina* of the *choroides*.

4 The *tunica retina*.

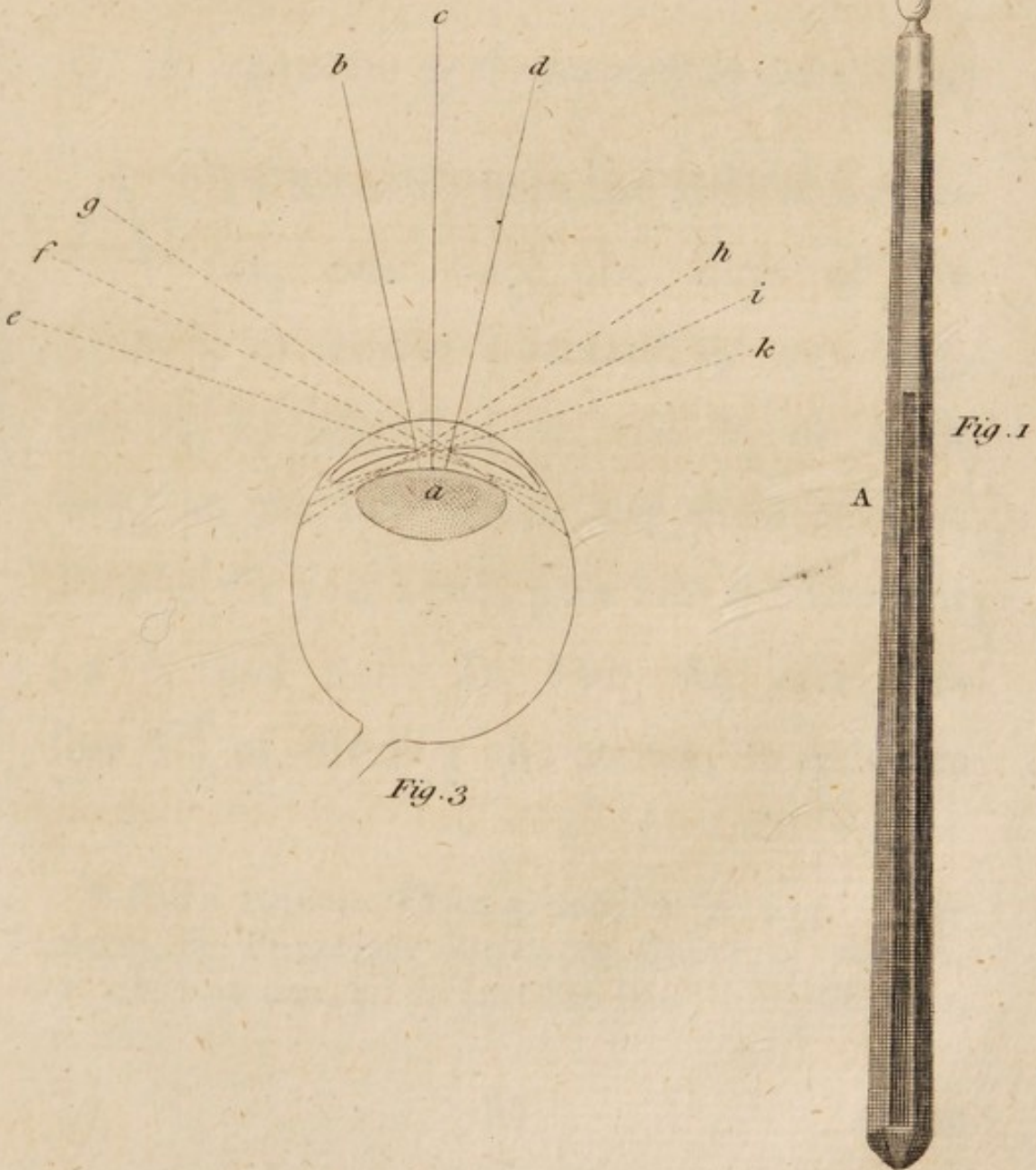
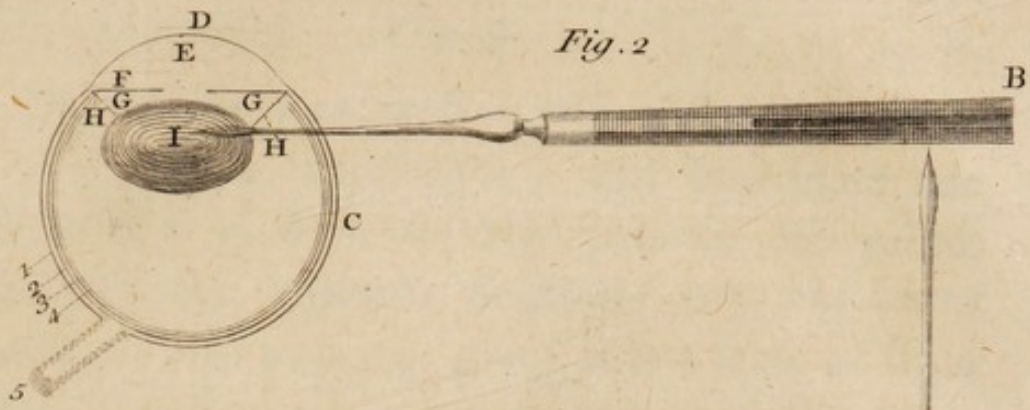
5 The oblique insertion of the *optic nerve*.

All that space betwixt the internal surface of the *cornea* and the *iris* is called the anterior chamber of the eye.

All that space betwixt the *iris* and the *chrystalline* lens is called the posterior chamber of the eye. Both these spaces are naturally filled with the *aqueous* humour of the eye.

That part of the eye behind the *chrystalline* is filled with the *vitreous* humour, which on its anterior part forms a bed for containing the posterior part or more convex surface of the *chrystalline* lens.

Fig. 3.



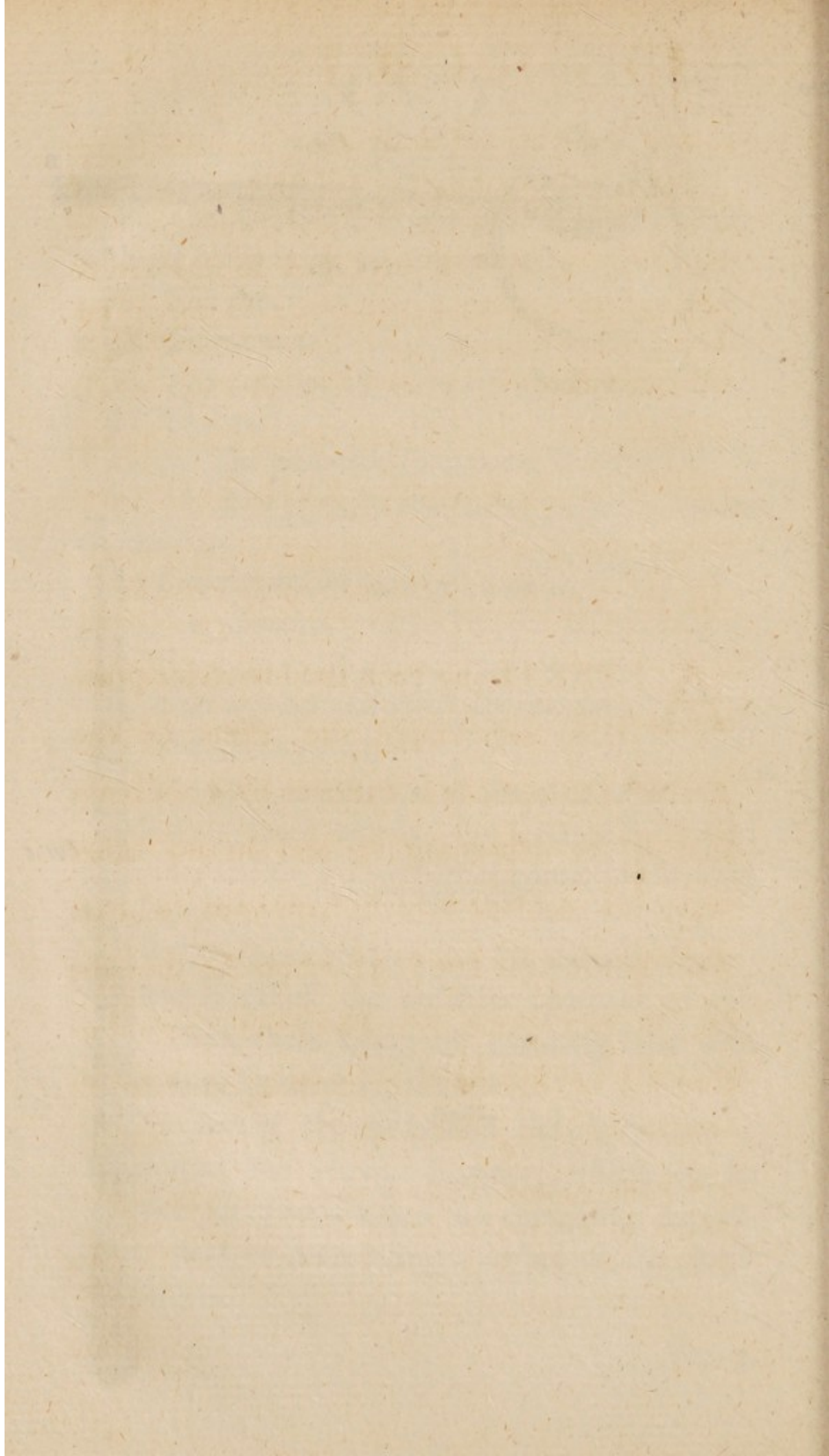


Fig. 3.

Shews how a cataract *a*, will obstruct the light *b. c. d.* which is before it; and how some side light *e. f. g. h. i. k.* may pass to the retina through the aqueous humour, but not being brought into a focus, gives only a sense of light without vision.

## S E C T. XVII.

*Of the operation on the cataract by extraction.*

**A**FTER having been the invariable practice, ever since the time of the Arabs\*, to remove a cataract by couching, that is, by depressing it, and in no other way, an accident which happened to Mr. *Petit* in the year 1708, gave him the thought (as it had done *St. Yves* the year before †) of dividing the cornea, in order to

\* Palfin Anatom. Chirurg. tom. 2. p. 433. Memoires de l'Academie Royale de Chirurgie, tom. 6. p. 328. and tom. 5. p. 392. 8vo edit. † *St. Yves*, p. 227.



come at, and remove a chryſtalline, which had paſſed into the anterior chamber of the eye, in which he ſucceeded, as Mr. *St. Yves*, who was preſent at the operation, relates very particularly \*. But we muſt not forget to mention, that *M. Mery* was the firſt who propoſed in a clear manner, this method of operating by extraction, in a memoir preſented by him in the year 1707, to the Royal Academy of Sciences †: And here it reſted, until the year 1745, when Mr. *Daviel*, after attempting, to no purpoſe, the depression of a cataract, with the ordinary needle; and upon his obſerving the cataract to be broke to pieces in the attempt, and its fragments got into the anterior chamber, which was alſo filled with blood, ſo as to have no ſight of the needle, he was

\* *St. Yves*, p. 228. † *Mem. de l'Acad. Roy. de Chir.* tom. 6. p. 325-6-7-8.

obliged to withdraw it, and to cease from all farther operation: But on recollection of what had happened to Mr. *Petit*, he determined to follow his example, and to open the transparent cornea, which he did, and it answered his end, as by so doing, he evacuated the chamber of the blood, and of the fragments which had passed into it; the pupil then became clear, and the patient could distinguish objects: The final event, indeed, was not so happy; as the injuries done to the internal membranes, and the division of the vitreous humour, both of which were occasioned by the first operation, brought on a suppuration\*; however, Mr. *Daviel* saw very plainly, that cataracts might be absolutely removed, and taken quite out of the eye, by this method of operating; and accordingly he took a resolution to pur-

\* *Memoires, &c.* tom. 5. p. 373.

sue it farther ; but as there were several distinct things to be done, to render the operation complete, he turned his thoughts towards the providing of all the implements, which should seem necessary and proper, to answer each distinct purpose.

Simplicity is not always among the first thoughts, which occupy the mind of an inventor : That comes in afterwards, among the improvements of new inventions : The first object, is the care that nothing be wanting in the apparatus, to secure success in the execution of what is designed to be done ; nor is it to be wondered at, if something superfluous should result from it. This may be presumed to have been the case with Mr. *Daviel*, who indeed to do him justice, persevered, for the most part, in the old method of couching, so long as, until he could satisfy his own mind, that there was nothing deficient, or defective in the

new

new method, in regard to the number, size, figure and form of his instruments, or in his manner of using them\*.

After much and long deliberation on this head, and after many reflections on the hazard always run, by the thrusting of a pointed or edged instrument through the several coats of the eye; and by traversing the vitreous humour, of pricking, cutting, or deranging the membranes and other internal parts; and in fine, by an event which happened to him in the year 1747, he became fully confirmed in his purpose of practising the operation for the future, only by extraction. The affair was as follows.

A person had a cataract in each eye, which seemed to Mr. *Daviel*, very good and favourable for depression; but upon finding himself, by no means able to effect it, ei-

\* Memoires, &c. tom. 5. p. 376-9.

ther on one or the other, he resolved to open the cornea, which he did, and dilated the opening; He after this, raised it up with a small pincer, and carried his little spatula across the pupil, with which he drew out of the posterior chamber of the eye, all the chrySTALLINE which was divided and broke into many pieces, by the first operation he had made: This extraction was followed by the issue of a portion of the vitreous humour, which had been also divided by the preceding operation; but notwithstanding which, the patient was well able to distinguish objects. The operation had no ill consequences, and the patient soon recovered\*.

By the latter end of the year 1752, he was able to count 206 operations, which he had performed, in a variety of places,

\* Memoires, p. 380.

by this method of extraction; of which 182 succeeded\*. His invention was approved of by the Royal Academy, and thought worthy of being carried to all the perfection it was capable of; and to this end, the most eminent surgeons of that time and nation, began soon to think of reducing the number of instruments, by contriving one, which should be fitted to serve several purposes; for instance, a single knife, instead of two needles and two pair of scissors, for the puncture and incision of the cornea; more especially, as thereby, the time employed in performing the operation, would be shortened, and the operation itself, rendered less difficult and hazardous †. Mr. *Garengéot* is the first mentioned to have performed the operation successfully, with a

\* Mem. p. 382. † Mem. p. 398. and M. Delz Faye's Memoir, tom. 6. p. 304-5

launcet and sciffors, for the section of the cornea, and a curette, to disengage the upper part of the chrystalline\*.

Several eminent surgeons, then and since, have attempted the performance with one single instrument, viz. a knife, differing each of them in form, &c. one from the other. Mr. *Poyett's* contrivance was altogether singular; he made use of a two edged knife, having a hole at the extremity, carrying a thread; this knife with the thread, was to be passed through the cornea, from one side to the other; the thread was then to be freed from its hold in the knife, by a small crotchet; the two ends of the thread were to be fastened together by a knot, and then to be taken hold of as a handle †, by which the globe of the eye was to be sustained and kept from motion; and by this

\* Memoires, tom. 5. p. 398.

† Mem. p. 399.

means the operation, he thought, might be made to terminate safely and readily, without the necessity of employing successively so many instruments \*. And this contrivance was at first, while it was tried only on dead subjects, much approved of by Mr. *Morand*, and others of the Royal Academy; but when the experiment came to be made on the living body, it was found so to prolong the operation, and to be otherwise so useless, that Mr. *Poyett* himself soon gave it up, resolving to use it no more †.

But of all the instruments invented and designed for the opening of the cornea, Mr. *Sharp's* knife seems to have much the preference, of which the reader will have an account, when I come to speak from his own relation of his manner of operating: But first to return to Mr. *Daviel*.

\* Mem. p. 400.

† Mem. tom. 6. p. 337-8.



The instruments employed by him were, first, a pointed and cutting *needle*, half curved, having the form of a lancet, destined to make the first opening; secondly, A blunt pointed, cutting, and also half curved *needle*, to enlarge the same opening; thirdly, two pair of convex curved *scissars*; fourthly, a little *spatula* made of gold, silver, or steel, slightly curved, to lift up the cornea; fifthly, another very small pointed *needle*, cutting on both sides, to open the membrane which covers over the chrySTALLINE on its fore part; sixthly, a small *curette* or scoop, of gold, silver, or steel, to facilitate, every now and then, the issue of the chrySTALLINE, or to draw forth the fragments of this body, when any of them is left in the hole of the pupil; seventhly, a small *pincette* or pincer, to take out the portion

tion

tions of membrane, which might present themselves\*.

Mr. *Daviel's* own relation of his manner of using them, in performing the operation, is as follows. The necessary apparatus being all properly arranged, the patient was to be placed in a chamber moderately illuminated, to the end that the too great light might not constringe the pupil, or penetrate too forcibly into the eye, after the operation. He was then to be seated upon a somewhat low chair or stool; the operator to sit facing the patient, on a higher chair, to the end, that in operating, he might rest his elbows on his knees. The other eye was to be covered with a veil, after which a disciple, placed behind the patient, was directed to put one hand on the forehead, stretching out two fingers upon the

\* Mem. tom. 5. p. 383.

upper lid, and the other hand under the chin †.

The operator was to lower down the inferior eyelid, and taking the *first mentioned needle*, he was to plunge it into the anterior chamber, near to the sclerotic, avoiding to wound the iris, and he was to carry it above the pupil; after which he was gently to withdraw it, and to lay hold of the *second blunt pointed needle*, with which he was to enlarge the incision already begun, by carrying on this needle to the right and left, in order to open the cornea, in form of a crescent, agreeable to its round figure.

But as the cornea then becomes somewhat lax, the operator was to take the *convex curved scissars*, and to introduce its blunt branch between this membrane and the iris, and to finish the section both on one

† Mem. p. 384.

side and the other, so as to carry it on each side to a little above the pupil: It should be minded, that in the curvature of the scissars, a regard should be had to the globe; and that in relation to their curvature upon the flat, two pair were necessary, that they might be accommodated to the roundness of the cornea, on one side and the other.

The operator, after this, takes the *little spatula*, with which he is to lift up softly, the divided part of the cornea, and with the *small pointed and cutting needle*, to cut into the membrane of the chrySTALLINE: Sometimes it becomes necessary to cut this membrane circularly, and carry it entirely off, if it should be found thickened and wrinkly, least it should block up the pupil; and then this membrane being well separated, it may be moved away by the small *pincettes* \*.

\* Mem. p. 384-5.

After having divided the membrane which envelops the chryſtalline, care ſhould be taken to carry the little *ſpatula* between this body and the iris, in order to detach the cataract entirely, and facilitate its iſſue; afterwards the cap of the cornea is ſuffered to fall back, in order to put the finiſhing ſtroke to the operation\*.

And it is then, ſays Mr. *Daviel*, that the ſurgeon hath need of all his prudence, as the veil is then to be removed, which hid the light from the patient's eye; in order to which, the globe of the eye ſhould be preſſed with that gentle force, as ſhall give an exit to the cataract, without fatiguing the eye; and by ſo doing, the rupture of the poſterior membrane of the chryſtalline is avoided, which ſerves as a dam, and which hinders the eruption of the vitreous

\* Mem. p. 386.

humour : It is pleasing, says he, to behold how the pupil enlarges itself, by little and little, and the chrystalline having once presented its limb, glides gently into the anterior chamber, and from thence upon the cheek. The pupil is now to be re-established, which sometimes is deranged by the issue of the chrystalline, more especially when it is hard, solid, and of a large bulk.

If the cataract happens to be soft and slimy, and to burst, whatever remains behind, should be taken away, by employing the *curette*, which the surgeon should carry round the pupil, as often as may be necessary ; after which the cap of the cornea is to be accurately replaced ; the eye must be softly wiped with a small, delicate and supple sponge, soaked in warm water,

with

with a few drops of spirit of wine mixed in it; or of the ophthalmic water; a little cotton pellet should be put on the eye, and a plaister upon that, with a bandage, not too tight, to secure the whole: The head is to be covered with a napkin; the patient is to be laid in bed, in an obscure chamber, and if possible upon his back, and with curtains drawn round the bed.

The eye should be fomented with an emollient and resolvent decoction, twice or three times in a day, and as much as shall be thought necessary: Opening a vein must not be forgot, nor a careful diet, and for the rest, the patient must be treated according to the usual and ordinary rules \*

Having thus given the reader a particular relation in what manner, and with what instruments this operation was performed by

\* Mem. p. 386.

Mr. *Daviel*, who first brought it into modern practice ; it remains, in the next place, to give some account of what alterations or improvements have been since introduced. I have before made mention of Mr. *Sharp's* knife, which he describes to be a little larger than an iris knife \*, and of which he has caused a figure to be engraved † ; the blade of this knife is so shaped, as to increase in breadth, all the way towards the handle ; by which means the punctures (to be spoken of presently) are so exactly filled up by the blade, that very little of the aqueous humour is discharged, before the incision is begun, and consequently during this time, the cornea preserves its convexity ‡ . Mr. *Sharp* relates his manner of using this knife, to be, by holding its edge

\* Critical Enquiry, p. 252. † Philosophical Transactions, vol. 48. A. D. 1753. p. 161. ‡ Phil. Tr. p. 162.



downwards, and making a puncture through the cornea, near its circumference, into the anterior chamber of the eye, in such a direction, as to carry it horizontally, and opposite to the transverse diameter of the pupil; after which he passes it towards the nose, through the cornea, from within outwards, as near to its circumference as in the first puncture; when this second puncture is made, he pushes the extremity of the blade one seventh of an inch beyond the surface of the cornea, and immediately cuts the cornea downwards, drawing the knife towards himself, or towards his right hand, as he makes the incision almost semilunar, and nearly parallel to the inferior half of the circumference of the pupil, so that the future cicatrix will obstruct the light but very little\*.

\* Crit. Enq. p. 252.

Mr. *Daviel* recommends an incision of nearly two thirds of the circumference of the cornea, but Mr. *Sharp* thinks what he has mentioned will be found more commodious; as so large a wound as Mr. *Daviel* directs, will be apt to give issue to the vitreous humour\*.

But Mr. *Warner* says, the larger and lower the incision is made, the better the operation will be likely to succeed; and if it happens, that the wound through the cornea proves too small, it must be enlarged by a pair of sharp scissars, well polished, the blade of which must be curved, so that they may have a convex and concave surface: He also advises, that as soon as the incision is made through the cornea, the eyelids should be let loose †.

But

\* Critic. Enq. p. 253. † Warner's Def. of the Human Eye, p. 101. It has been particularly observed of

But Mr. *Sharp* goes on and says, a gentle pressure is to be made with the thumb against the inferior part of the globe of the eye, in order to expel the cataract; which finishes the operation \*.

Mr. *Sharp*, in a subsequent paper, given into the Royal Society, appears to have altered his method, in respect to pressing the globe of the eye, to expel the cataract; and to have practised a different one, viz. upon his having remarked that though, upon the evacuation of the aqueous humour, the chrystalline readily advances through the pupil, into the anterior chamber, yet

Baron *Wenzel*, that after having cut through the cornea, both he and his assistant let go their hold of the eyelids, in order to give the eye time to recover its steadiness. When the eye has done rolling about, which is known by the motion ceasing under the eyelids, he then again opens the eyelids, and punctures the capsula, upon which the chrystalline generally escapes.

\* *Philoso. Transf.* p. 162.

that it required some force to expel it from its membrane, through the wound of the cornea; and in that action sometimes, suddenly drew after it, a portion of the vitreous humour; he therefore instead of pressing the globe of the eye, when once the chrystalline got into the anterior chamber, immediately stuck the point of his knife into the body of it, and extracted it contained in its capsule, without spilling any of the vitreous humour; and this he mentions to be a considerable advantage, but acknowledges at the same time, that a large quantity of this humour, a third part or more, has been sometimes discharged without any bad consequence\*.

He says, that in making an incision on the surface of the chrystalline, and wounding its capsula, the chrystalline will fre-

\* Phil. Transf. vol. 48. A. D. 1753. p. 328-9.

quently slip out of the capsula, which will be left behind; but he observes, that should the humour slip out of the capsula before it be seized by the knife, it possibly will waste; as that in milky cataracts, when the fluid is discharged, the membrane, in length of time wastes: Whole cataracts, with the enveloping membrane, sometimes waste. However, if the removing of the capsule should, by future experience, be found necessary, it may be conveniently done by the curette, (a small scoop) which Mr. *Daviel* recommends on this occasion. The same instrument may also be used for the extraction of a cataract which has been broke to pieces by the couching needle \* in a former operation.

Mr. *Sharp* repeats also in his *Enquiry*, what he had before advanced, viz. that

\* *Phi. Tr.* p. 330.

should the diseased chrySTALLINE not readily fall out of the eye, but remain lodged in the anterior chamber, that then the operator should not press the eye in order to expel it, but immediately stick the point of the knife into the body of it, and extract it contained in the capsule\*; by this method, he thinks, the wounding of the membrane of the chrySTALLINE, &c. as Mr. *Daviel* prescribes, prior to the extraction of the chrySTALLINE itself †, will be rendered unnecessary; which processes of Mr. *Daviel*, he says, are difficult to the operator, fatiguing to the patient, and, if the knife be used in the manner recommended, altogether needless; for since the chrySTALLINE advances with so much readiness through the pupil, it will be easily seized by the knife, and removed

\* Enquiry, p. 254.

† See p. 93.

from the vitreous humour with its enveloping membrane †.

Mr. *Sharp* concludes with saying, that although this operation is attended with some difficulties, and liable to some bad consequences, yet still the success he has had in performing it, has greatly surpassed that which follows upon couching; and speaks of it, as hoping that it might be esteemed an useful and happy invention; and seems to attribute its coming so slowly into repute, to the operation being too difficult to be universally practised, from the liability of failing in the requisite exactness of the incision, and to the shyness of practisers, in adopting a method which exposes them to chagrin, and in the event of which, their characters are so much at stake \*; by which words may we not understand him to mean,

† Crit. Enq. p. 255-6.

\* Id. ibid. 264.

that this risque of character depends on the novelty of the method not yet generally adopted.

Mr. *Warner* differs, in some few instances, from Mr. *Sharp*, particularly, in regard to the largeness of the opening to be made in the cornea\*, which I have already taken notice of; as also in respect of wounding the aranea, or, as he expresses it †, the division of the capsula of the cataract, in which he agrees with Mr. *Daviel*, and recommends it to be done a few minutes after the cornea has been incised ‡, and looks upon it to be of great consequence in this operation, since this membrane, he says, becomes sometimes so tough and thick, as to make a very considerable resistance, to the pressure of the globe of the eye; in

\* See p. 99.

† Descr. of the Eye, p. 101-2-3.

‡ Idem. p. 101.



which case, a great part of the vitreous humour is discharged, unless the capsula of the cataract be wounded\*.

Immediately after the membrane is wounded, he recommends gently pressing the globe of the eye upwards, that the cataract may be squeezed through the pupil and inferior part of the cornea, where the incision has been made, and through which the aqueous humour has been evacuated †. I shall not take upon me to decide between these two gentlemen, both of great eminence in their profession: they agree in the main circumstance, of puncturing through both sides of the cornea, and immediately dividing it downwards, as also in most other particulars relating to this operation, as well as in the neat and apt shape and structure

\* Descrip. of the Eye, p. 103. and Cases in Surgery, p. 89. † Descrip. of Hum. Eye, p. 102.

of their instruments, which they have given plates of, in the books referred to, and which are copied here\* See Plate II.

Mr. *Daviel* himself very candidly acknowledges, that this manner of operating by extraction is liable to some accidents peculiar to it: His words are,

Whatever preference I think I ought to give to this manner of operating, I cannot but agree that it hath its particular accidents, but they are of such a nature as to be easily relieved, and there are some of them which may be prevented; for example.

It may happen, during the operation, that a portion of the vitreous humour may flow out of the eye; but one may be almost sure to avoid it, by pressing but very lightly

\* See Warner's Description, &c. p. 108. and Cases, p. 91.

upon the globe, whilst one is endeavouring to make the chryſtalline come forth.

One meets with caſes where it appears neceſſary to employ a ſtronger preſſure, and if the membrane of the chryſtalline adheres to the iris, then this adherence muſt be deſtroyed with the little ſpatula, and the pupil yields by little and little to the iſſue of the chryſtalline.

If it happens by a wound made in the iris, that blood ſhould flow into the anterior chamber, it runs off eaſily through the incision; nor does that in any manner retard the operation; as he had experienced in a caſe where Meſſ. *Le Dran, Morand, La Faye* and ſeveral others were witneſſes to the fact, that the eye was not the worſe for it, and the patient ſaw objects as perfectly as with the other\*.

\* Mem. tom. 5. p. 387-8.

If the needle appointed to open the cornea, be too hastily withdrawn, the iris may follow the aqueous humour, and this membrane may be found pinched between the two lips of the little wound; but it is very easy to disengage it by softly lifting up the cornea with the little spatula; sometimes even the natural motions of the eye, of themselves, oblige it to retreat into its own place.

In the course of the cure, the iris may again escape through the opening, and form a *staphyloma*; but it is very easy to remedy it, in causing the iris to retreat back again; and it may be almost surely avoided, by observing, in dressing up the eye, not to bear too tight on it with the bandage, as this accident is most commonly the consequence of too violent pressure\*.

\* Mem. p. 389.

Mr. *Daviel* imagines, that it will be readily admitted, that the accidents of which he has here spoken, are of very little importance, in comparison with those which may happen from the ordinary way of operating, and he has drawn a parallel between the two methods of operating, in order to point out the advantages of that by extraction.

But I must not omit to mention, that Mr. *Warner* adds two other accidents to those which Mr. *Daviel* has remarked from this way of operating, viz. that the pupil is subject to be lacerated by the cataract's forcing its way suddenly through the pupil, whence sometimes a total contraction of it afterwards \*; secondly, he mentions a sinking down of the globe of the eye, a deformity and an irrecoverable loss of sight, proceeding

\* Descr. p. 107-8.

from the too great evacuation of the vitreous humour, at the time of operating.

In order to form a proper judgment between the two operations, the reader must bear in mind what has been already mentioned; he will particularly remember what happened in the Hermit's case, where the chrySTALLINE was broke to pieces, by a fruitless endeavour to depress the cataract, many portions of which passed into the *anterior chamber* \*. At other times, those fragments of the chrySTALLINE, broken into pieces by the needle, passed through the pupil into the *internal chamber*: Sometimes he found it to be got between the *retina* and the *cho-roid*, and both these membranes rent in several places †.

He observes in regard to needles in general, that the fine pointed ones, can do

\* Mem. p. 373.

† Id. p. 377-80.

nothing but prick or puncture, and therefore that they must be the occasion of all those accidents pertaining to the pricking of very sensible and delicate parts \*. Those which have sharp edges, cut the vessels, and often cause an effusion of blood into the eye, which hinders the finishing of the operation: those which are flat, blunt, and rounded, may bruise and lacerate the internal membranes of the eye and produce grievous accidents †.

He found it sometimes impossible to effect a depression of the cataract, and the attempt mischievous ‡; and he mentions in the very case which determined him to pursue the method of extracting it, that after a fruitless and mischievous attempt to depress a cataract, he succeeded happily in the extraction.

\* Mem. p. 377-80.  
p. 378-80.

† Id. p. 379.

‡ Id.

He takes notice of the necessity of waiting 'till the cataract be solid, before a depression be attempted, which in some cases never happens \*; but a cataract may be extracted even from its beginning, and without waiting for its maturity.

A depressed cataract may rise again, and that after the best performed operation, nay even a long time after; and it is well known that this has sometimes happened †. But when a cataract has once made its escape out of the eye, it can never appear again.

A cataract sometimes, either wholly or in part, passes through the hole of the pupil, into the anterior chamber, in the time of the operation; and it is known to have happened several years after ‡; in which case, the chrySTALLINE being an extraneous sub-

\* Mem. p. 390.  
St. Yves, p. 226.

† Id. *ibid.*

‡ Id. *ibid.* see also



stance in this place, its residence there must be very incommodious, and may even draw after it, the loss of the eye; or at least it will require another operation\*: But by extraction the cataract is drawn quite out of the eye, being caused for this purpose to pass through the pupil.

In operating by depression, on a soft cataract, the operation becomes often imperfect, by the fragments of the lacerated membrane; and moreover charged with some slimy portions of the chrySTALLINE, which may block up the pupil, and oppose the same obstacle to the rays of light, as the entire cataract †. But Mr. *David* says, he has drawn out soft cataracts: He has taken out some resembling hydatids, and has detached others which were adherent.

\* Mem. p. 309. † Mem. p. 391.

To depress a cataract by the old method, it becomes necessary to traverse the vitreous humour, and to break in upon the cellules, which are sometimes lacerated by the more or fewer repeated movements of the needle; but which cannot be done without important consequences; and which cannot be avoided, although a needle be employed, which has neither point nor edge; but this accident never can take place in the method by extracting.

In couching, says Mr. *Warner*, the needle is passed through all the coats, which are concerned in composing the external, as well as the internal parts of the eye, except the cornea and the iris, viz. the conjunctive, albuginea, sclerotica, choroid, and retina; and that those temporary retchings to vomit, and severe pains in the head, which are sometimes known to succeed this operation, probably  
 arise

arise from wounding the retina: He says moreover that the border of the iris is liable to be wounded by the couching needle's being directed too forwards\*.

*Adbuc sub Judice lis est.*

\* Description, &c. p. 106-7.

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#### EXPLANATION OF PLATE II.

This plate contains the instruments employed by Mr. *Warner* in the extraction of the cataract; as also the knife used by Mr. *Sharp* for the same purpose.

Fig. 1. The eye with Mr. *Warner's* knife passed thro' the cornea.

Fig. 2. The eye with Mr. *Sharp's* knife passed thro' the cornea.

Fig. 3. The eye with the wound on the inferior part of the cornea, with the instrument passed under the cornea, and lying upon the iris, for dividing the aranea.

Fig. 4. The cataract.

Fig. 5. The instrument for dividing the aranea with the point of the launcet out of its case.

Fig. 6. The curved scissars for enlarging the wound of the cornea.

Fig. 1.



Fig. 2.



Fig. 3.

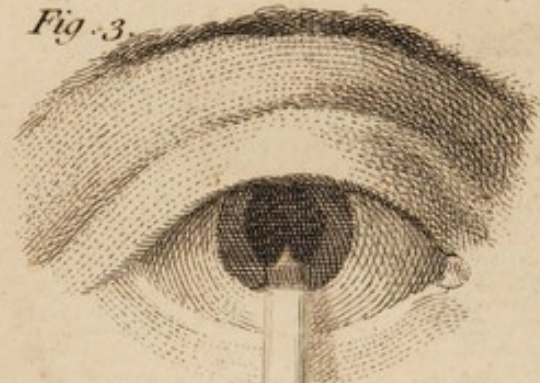


Fig. 4.



Fig. 6.

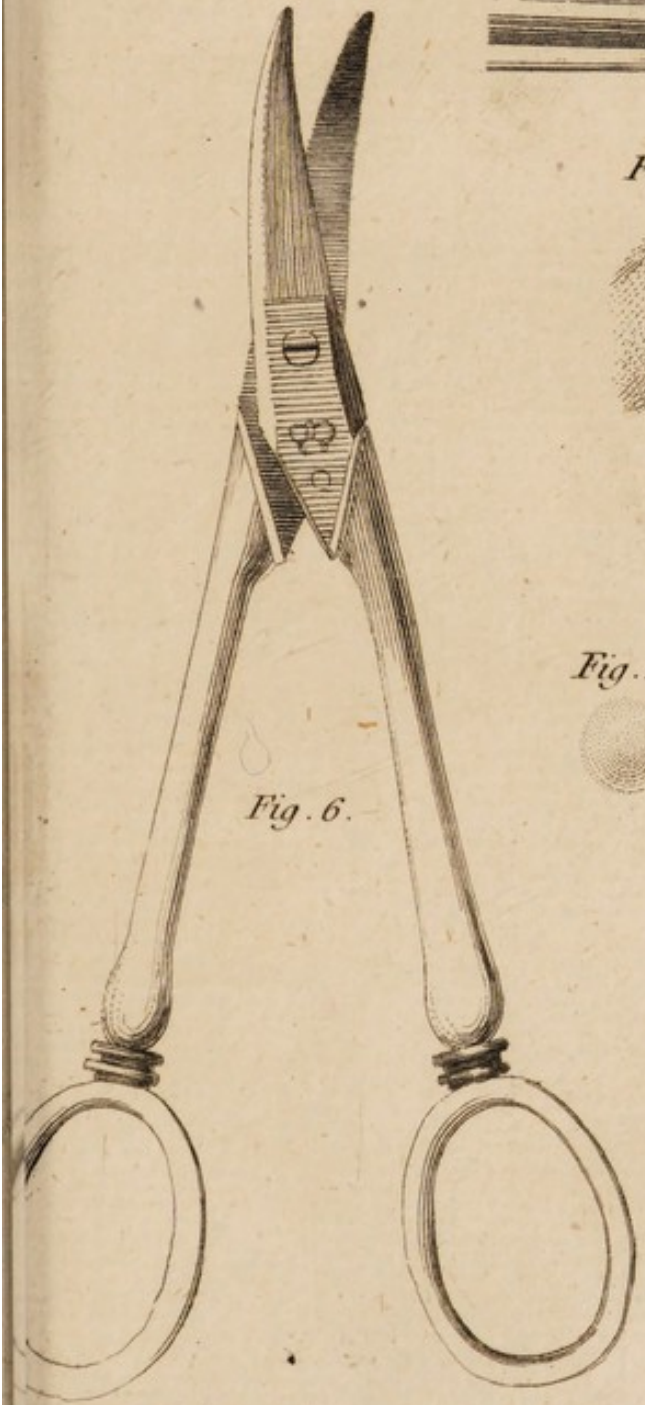


Fig. 5.

