

**On diseases of the eye, as a guide in the study of pathology / by Arthur Jacob, M.D.**

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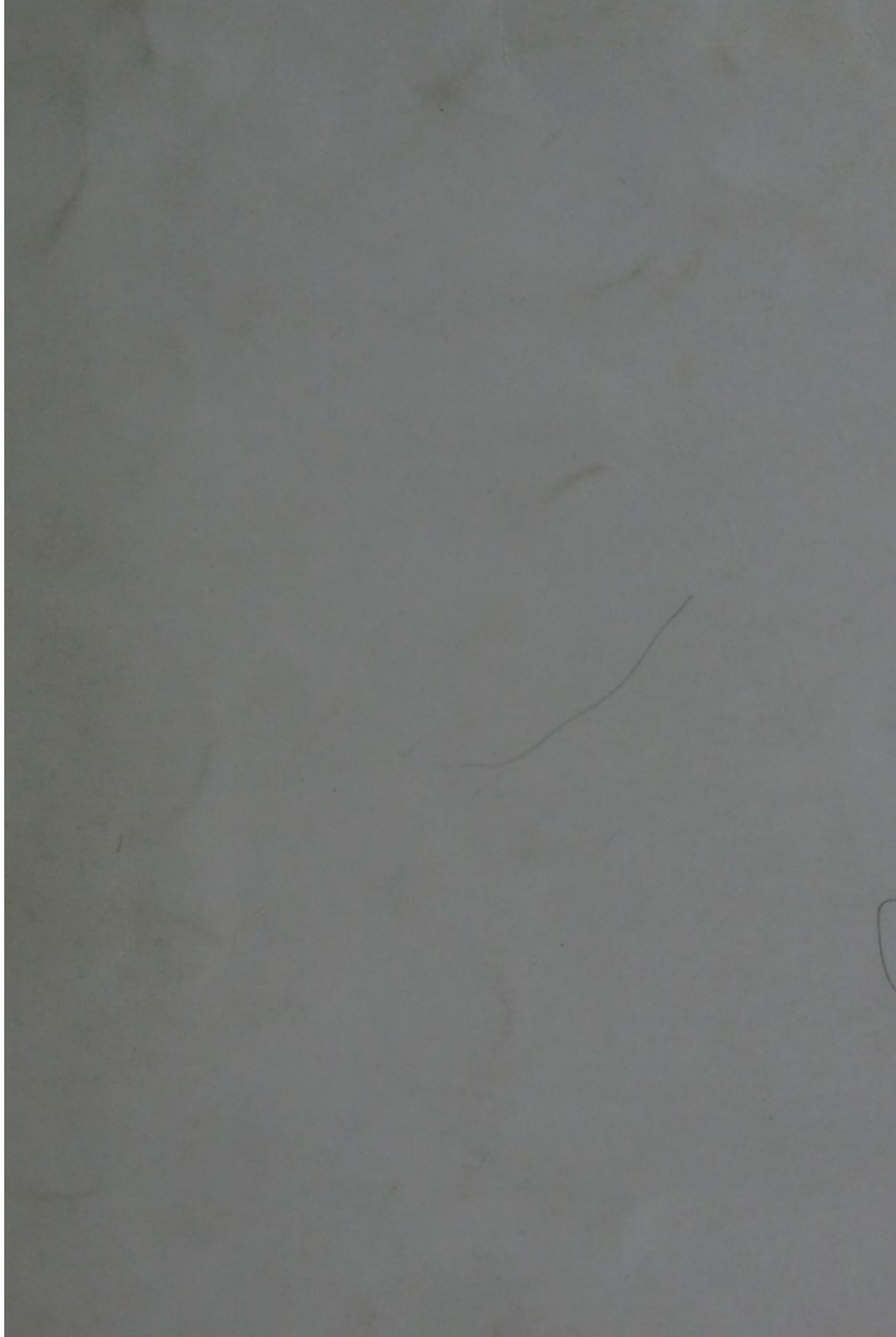
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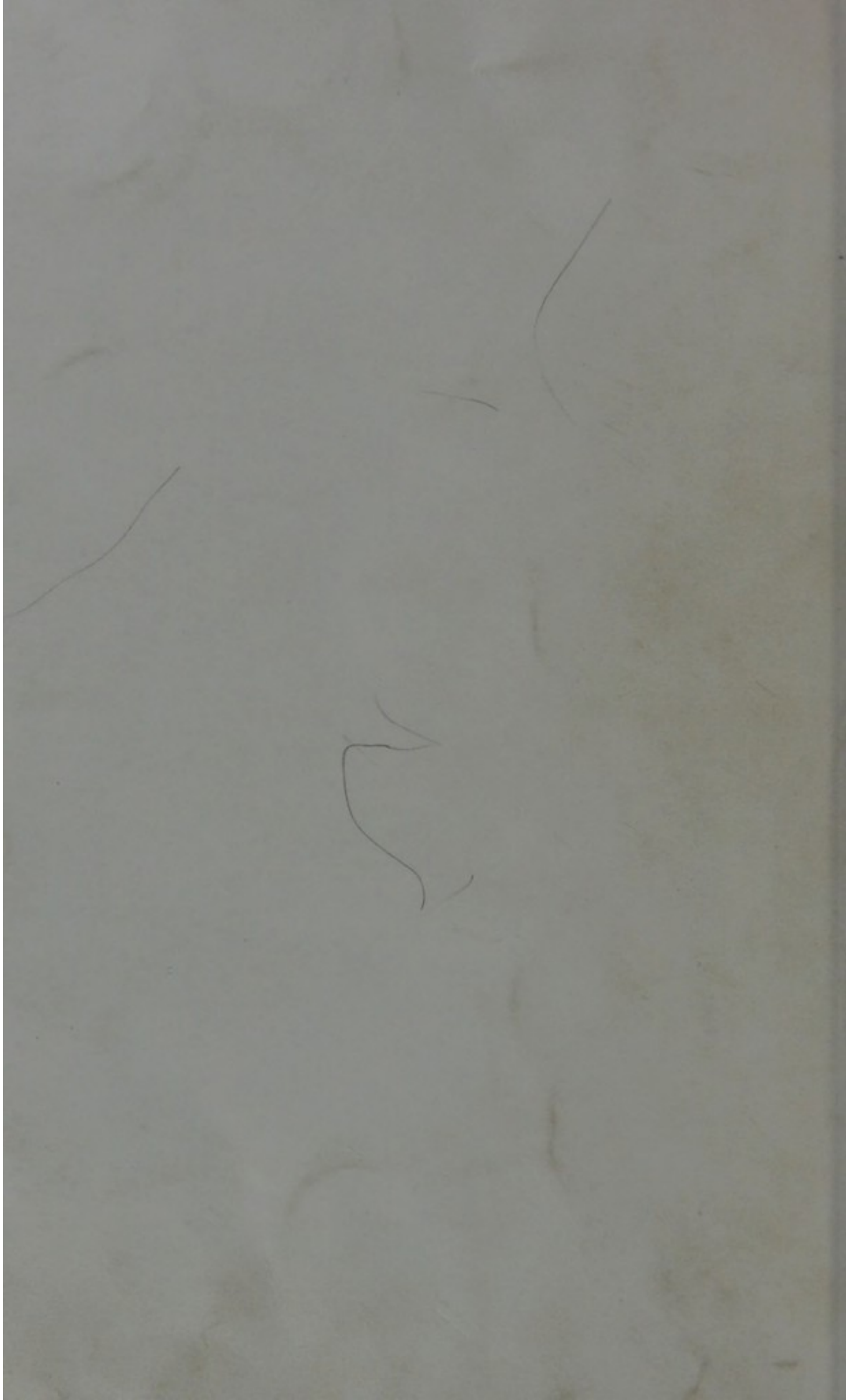
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*with the authors 1871*

ON DISEASES OF THE EYE,

26

AS A

GUIDE IN THE STUDY OF PATHOLOGY.

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ONE of the most remarkable things in the history of medicine, and which has existed from the most remote antiquity to the present day, is the selection of diseases of the eye, by ignorant persons, as a means of livelihood; and, although now men totally destitute of medical knowledge seldom do so, it is not an uncommon practice with imperfectly educated people, or those who despair of obtaining practice in any other department. An inquiry into the cause of this would probably elicit some curious discussion, and throw some light on the subject of medical study in general; but this cannot be indulged in here. The most obvious explanation is afforded by the fact that manual dexterity often exists independent of intellectual attainments. It is matter of common observation that a man may perform difficult surgical operations adroitly, and yet be scarcely capable of discriminating the disease which he thus removes, if it happens to be obscure; but the vulgar do not understand this. All they know is, that a defect has been remedied, or a painful disease removed by a certain person, and they infer, perhaps naturally enough, that the same person can therefore remedy all defects, and remove all painful diseases. As the vulgar error does not remain a secret, people avail themselves of it as a matter of course: and even the parties creating it participate in the delusion. A man who operates on a cataract, or cuts for a squint, persuades himself



that therefore he is qualified to treat a difficult inflammation, or a complicated defect of sensibility, and would be very indignant if any one expressed a doubt of his capacity to treat disease in every shape and form after he had given such convincing proof of his power to remove or remedy it in one. This selection of the treatment of diseases of the eye, as a means of livelihood by comparatively incompetent persons, has led to results injurious to the study of this branch of medicine, and has been the cause of the perpetuation and diffusion of much that is erroneous or untrue. In the present day medical honours have been so prostituted, that degrees or diplomas are no longer accepted by the public as a proof of qualification or skill; candidates for practice must, therefore, do something to establish their characters for erudition and originality, and therefore generally begin the world by making a book. But, to make a book, a man must learn and think, or else appropriate the learning and thoughts of others. The latter is the most convenient course, and is, therefore, that most generally adopted; but, in resorting to it, the compiler feels his incompetency, and dares not venture to correct erroneous views, or refute unfounded statements, unless, indeed, strengthened by the confidence of ignorance he attempts to do so, and substitutes his own blunders for those of the authority he pretends to right. Thus have ancient errors been perpetuated, and new ones introduced, until ophthalmic medicine had become discreditable to the character of medical science in general, and ceased to afford authentic information to those investigating disease in other forms.

Those who write for notoriety only, having nothing new or original to communicate, feel it necessary to afford proofs of their fitness to discharge the duty they profess to undertake, and, with this view, boldly assert their claims to be considered learned and experienced. With the most meagre acquaintance with anatomy and physiology in general, they undertake to describe the structure and mechanism of the most elaborately constructed organ in the animal frame, and gravely proceed to explain the uses of parts which have exercised the ingenuity and sagacity of men who have devoted their lives to such studies. Their erudition is as deep as their anatomical skill is perfect. They are as familiar with the writings of Ruysch, Morgagni, Albinus, Haller, and Zinn, as the school boy is with his grammar, and, with the utmost composure, determine all matters of dis-



pute between them by an enunciation of their own opinions, until an unlucky slip exposes the sources of their information, and shews that they are indebted to some pains-taking compiler for their authorities and quotations. To display an intimate acquaintance with modern foreign authors is equally essential, and those of Germany are generally preferred, because a knowledge of the language of that country is less common. With this view the treatise is rendered imposing by the introduction of a number of unpronounceable names of obscure individuals, distinguished for nothing but trifling refinements and childish speculations, while the more valuable sources of information are overlooked, because they are known and cannot be drawn from without acknowledgment. Those advertisement books are, however, received by inexperienced persons as authentic records and correct guides, and, with the help of judicious puffing, come to supersede the more valuable and instructive works.

The circumstances to which I have here briefly alluded, as well as many others to which I cannot now advert, appear to have divested the study of diseases of the eye of its importance as a branch of medical study in general. Men seem to feel that thus pursued exclusively, it is the especial province of those who confine themselves to it, and many even think that there is something in the pursuit not so dignified as the practice of medicine or surgery in other departments. This impression I would gladly remove, because although it is one, perhaps, calculated to serve those who devote themselves to the treatment of such diseases particularly, yet it is not calculated to raise them in public estimation, or to obtain for the subject that consideration to which, I am persuaded, it is entitled. I am, at the present moment, particularly anxious to do this, because there has latterly been evinced a determination to make this department of surgery subservient to the purposes of trade, and because there is danger that medical science may be degraded by the practice of a branch eminently calculated to improve and elevate it. The wanton mutilation of this most beautiful and perfect of nature's works, if we can say that one is more perfect than another, suggests these observations. While muscle-cutting candidates for fame confined themselves to the practice of the art where it is legitimately applicable, they should be permitted to enjoy the fruits of that pre-eminence to which they consider themselves entitled; but, when they extend their



operations to cases where they are not only useless but pernicious, it is high time to repudiate them, and to disclaim all participation in practices calculated to injure not merely the scientific, but the moral character of our profession. Mutilating the eyes of children, under pretence of curing what the inventor of this branch of medical practice calls muscular amaurosis, is not, perhaps, as dangerous to life as some other wanton human vivisections, but is equally discreditable to the art of surgery, Professing to cure cataract by external applications. in cases where the author of the imposition well knows that no cataract exists, is another instance of the same propensity to make the eye a subject for the exercise of ingenuity. But I am wandering from the object of this communication which is to prove that the treatment of diseases of the eye, so far from being the province of imperfectly-educated and partially-informed persons, is an object worthy of the attention of the most enlightened practitioners; and that not merely with a view to the removal of these diseases, but as affording valuable illustrations and lessons for the investigation of disease in general.

When I labour to prove that the study of diseases of the eye is eminently calculated to improve our knowledge of the nature of disease in other parts of the animal frame, and, therefore that it is a branch of medical education worthy of particular encouragement, I am liable to be looked upon as the interested advocate of a favourite opinion, and as one who attaches undue importance to a particular pursuit, because it engrosses his attention. I think, however, that I shall be able to convince the most unconcerned observer that the view I take is just, and that the conclusion I have come to is a correct one. The eye is destined to perform an office in the animal economy totally different from that of any other organ. By it whatever is effected by light on mind or body is produced, and, therefore, the anatomical organization of many of its component structures must be of a peculiar nature. Those parts which are to transmit light must not only be perfectly transparent, but delicately correct in their refracting properties and lenticular form. In no other part of the animal frame are there to be found similar materials, because in no other part are they required; therefore it is only in this one situation that we can contemplate these particular forms of organization, or study the changes which take place in them from disease. In other parts of the body we can investigate the nature



of bone, of cartilage, of ligament, of muscle, and many other structures; but in the eye alone can we examine the composition and properties of the material which forms a cornea, a lens, or a vitreous humour. It is by an investigation of the properties of all parts of the living being that we can form a correct estimate of the whole, and, therefore, it is that an organ, which affords several anatomical ingredients of a distinct and peculiar nature, constitutes a valuable object of study, and an additional source of information. Where, throughout the body, except, indeed, it be in the labyrinth of the ear, so difficult of access, can we see the final expansion of a nerve to receive the most delicate impression to which a nerve is subjected? Where, except on the iris, can we contemplate the undisturbed and uninterrupted action of muscular structure called into operation by delicate impressions and complicated associations? A cavity is to be filled with fluid to form part of the mechanism of an organ, as in the labyrinth of the ear, and the chamber of aqueous humour of the eye; but it is only in the latter situation we can observe the laws which regulate its production or removal, in exact proportion to the space it is to occupy; there only can we see the decisive proof of the influence exercised by the mysterious principle of vitality distinguished from mere physical agency. In the discharge of fluid by the salivary and urinary glands, we learn how much such operations are under the influence of mental operations and remote impressions; but it is in the flow of tears from the lachrymal gland we have the more direct and convincing proof of the effect of emotions and passions on glandular secretions. In no other part of the body have we such perfect ocular demonstration of the modifications to which mucous membrane is subjected, as in the conjunctiva; villous, glandular, and red-blooded on the inside of the lids; thin, tough, and smooth over the exposed part of the sclerotic; and transparent, soft, and polished where it covers the cornea: it shews in one small spot the difference between portions of the tegumentary membrane, according to the difference of office they are destined to fulfil in the animal economy, and enables us to correct the vulgar error that membranous continuations of such surfaces possess identity of character.

There is another circumstance which renders the eye one of the most valuable sources of information in studying the vital phenomena of the animal economy. The light which it transmits to the nerve can pass



through transparent matter only; and many of its parts being therefore necessarily diaphanous, we are enabled to observe the organization and properties of the structure beneath under the most favourable circumstances. Thus we can contemplate the changes which take place in the minute blood-vessels in consequence of direct irritation, as the conjunctiva, or the cellular membrane beneath it, becomes bloodshot from the contact of a mote, or the stimulus of a drop of some acrid fluid. Where else can we study this instructive vital phenomenon? A question has repeatedly arisen as to the vascular organization of transparent parts, and as frequently have superficial observers inferred that such parts are destitute of vessels because they cannot see red blood circulating in them. Here alone is the fact capable of demonstration that such vessels, in a state of rest or freedom from excitement, admit colourless fluid only; while, when stimulated or irritated, they receive red blood in abundance. The sclerotic of a young and delicate person, clear and colourless as pearl, with its transparent layer of equally colourless conjunctiva over it, shows but a solitary red vessel, if even so much; but let the surface be touched with a drop of soap and water, or any other irritating fluid, and at once it becomes crowded with red vessels, and exhibits all the characters of a highly vascular membrane. In no other part of the body can we see this change so distinctly, or verify its occurrence in separate vessels so clearly. It is true we can see the general redness of the skin when induced by pressure or friction, or by the excitement of heat, but we cannot see the vessels, a moment before invisible, suddenly become distinct as coloured blood can make them. We examine the foot of a frog, the tail of a fish, or the wing of a bat, to ascertain the state of the circulation in the smaller blood-vessels; but we might observe the same much more distinctly on the surface of sclerotic through the transparent conjunctiva. The structure and motions of the iris are seen to still greater advantage through the cornea and aqueous humour. Here we can not only contemplate a highly organized part through a transparent medium, but can view it with the assistance of a lens of the most perfect construction, provided by nature as if for the purpose. The whole of the animal frame does not perhaps afford so beautiful an object as this coloured disc with its aperture incessantly varying as the impressions vary, or the application of the organ is restricted or extended. The iris in the albino, as is well seen in the white rabbit,



is perhaps the most beautiful specimen of vascularity, in all its perfection, which meets the eye of the physiologist; with it the artificial injected preparations of the anatomist cannot, for a moment, compare; yet we scarcely find it made an object of study by persons professing to investigate the state of the circulation in the capillaries. In the actions of the iris so favourably exposed for observation in the aqueous humour, and beneath the cornea, the phenomena, which accompany muscular contraction, may be studied with greater advantage than in any other part of the body, because here alone can we see the naked organ undergo its changes of form and perform the duties assigned to it. Elsewhere we perceive the effect of this truly wonderful, this almost mysterious vital action, but here we see the act itself, and can trace it to the cause which elicits it. If the action of the heart could be viewed through a large transparent lenticular window in the chest, we should most probably possess much more accurate information respecting it; hidden as it is from view, we can now only make reasonable guesses as to the manner in which it accomplishes the objects for which it was designed. I need not say that I am aware that the actions of the iris not being in strict accordance with the laws which are supposed to regulate muscular contraction in general, that organ has often been held to owe its changes in form to other causes. This discrepancy, however, appears to me to prove not that the actions of the iris are independent of muscular contraction, but that the theories prevalent in the schools are not founded in truth: it is not the contractions and dilatations of the pupil which are anomalous, but the inferences drawn from superficial inquiries which are incorrect. In enumerating the instructive lessons to be derived from observation of the actions of the iris, and which are not to be learned from observation of any other part of the body, the effect of the active principle of the *Atropa Belladonna* in causing dilatation of the pupil must not be forgotten. The whole range of physiological experiment does not afford a more interesting fact, or one more difficult of explanation, notwithstanding the implicit confidence reposed in the opinions generally entertained respecting the phenomenon. The influence of a narcotic poison on the functions of an organ through the nerves is here unequivocally displayed, and the importance of the fact that such influence can be exercised through that channel is unequivocally proved.

I have endeavoured to point out very briefly the



value of the information to be derived from observation of the functions of the different parts composing the organ of vision in a healthy state, with a view to the investigation of the phenomena of life in the animal economy in general, and to explain why it is that the parts of this organ are particularly suited to that object ; but it is from observation of the eye in a state of disease, and especially in a state of inflammation that information, still more valuable, may be acquired. If physiology can derive illustrations and explanations from this source, pathology can borrow assistance toward its elucidation of much greater importance. In no other part of the body have we different modifications of the common tegumentary membrane, whether we call it skin or mucous membrane, so favourably circumstanced for observation when attacked by inflammation or subjected to other unhealthy changes. The dry skin, with its covering of lifeless cuticle, I am prepared to admit, affords examples of disease not to be seen on the conjunctiva, which may be called the skin of the eye ; but the conjunctiva, when labouring under cutaneous diseases, presents appearances not to be met with on the rest of the body. It must be admitted that the opportunities of observing the condition of the true mucous membranes, in a state either of health or disease, are few indeed during life, and it cannot be denied that conclusions, drawn from observation of them after death, must necessarily be of doubtful value. Except upon the tongue, the soft palate, and the visible portion of the pharynx, or in some other situation where external skin passes into internal mucous membrane, the colour, sensibility, and state of the secretion of the surface cannot be observed : but on the surface of the eye and the inside of the eyelids the most delicate changes may be seen with the greatest facility. Writers on pathology confidently describe the condition of internal mucous membranes when labouring under inflammation, but they really can afford no other proof of the truth of their assumptions than the appearances presented by the parts after death, than which nothing can be more fallacious. Much more just conclusions might be drawn from observations made during life on a membrane of the same nature similarly affected, and seen under every advantage, as to period of disease and variety of condition, and this cannot be done except in the case of the conjunctiva. If the student would acquire correct information as to the probable state of the mucous membrane of the air passages in bronchitis, I am convinced that he



could have a much better chance of doing so by inspection of the living conjunctiva, similarly affected, than of the dead mucous membrane of some other person who had died from this disease. That mucous membranes when attacked by inflammation have their vessels greatly enlarged, and consequently become much redder from veins and arteries, previously receiving transparent blood, admitting that which is coloured, is very probable, but we have no means of demonstrating the fact, except by a display of the parts after death, when the real appearances of life have totally faded or become deceptive. On the conjunctiva, however, suffering from an attack of common catarrhal ophthalmia, this change is observed with the utmost facility upon two modifications of the membrane, the glandular lining the lids, and the mere tegumentary one covering the sclerotic, and the alterations in vascularity may be watched and studied from the first bloodshot, as it is called, to the final conversion into a surface of uniform turgid redness. On a man treating a case of croup or bronchitis, and considering the means he possesses of arresting or diminishing local capillary action by impressions made on the centre of the circulation, such a lesson cannot be lost: it at once convinces him that he cannot completely controul the tendency to inflammatory vascularity, although he may restrain or abate it. There is a consequence of inflammation of mucous membranes scarcely to be seen during life, except upon the conjunctiva, and yet, it probably occurs frequently elsewhere. This is the effusion of serum into and beneath the membrane, what is commonly called chemosis by writers on diseases of the eye. Œdema of the glottis, as this consequence of inflammation of that organ is called, appears to be of this nature, and the patient perishes from it because no depletion can diminish the bulk of the swelled membrane which mechanically obstructs the passage. In the first stage of common inflammatory croup, the tumefaction of the membrane is reduced without difficulty, and the symptoms of obstructed respiration are relieved; but when this chemosis as it may be called, occurs, the fluid can be removed by absorption only, and this process is too slow to afford the requisite relief.

The alteration which takes place in the state of the secretions of mucous membranes are entitled to the utmost attention as marking the nature and progress of the disease, and I will venture to say that the change in this respect may be better studied in the



conjunctiva than elsewhere. It is true that when a patient labouring under bronchitis begins to expectorate freely, we can ascertain the amount and nature of the secreted fluid, but the more delicate changes at the commencement and termination of the attack cannot be observed; while the very moment of the first appearance of purulent discharge from the conjunctiva, as well as its discontinuance are easily ascertained. Some may say that such nicety of observation is of no practical importance; but I am labouring to prove that the principles upon which practical skill is founded, are indebted to such observations for their correctness, and to show that the organ to which I alluded, affords opportunities of making such observations not to be had in any other part of the body. A question arises as to the fact of the natural secretion of a mucous membrane being altered during inflammation, or in consequence of that change of organization which is produced by inflammation, and proofs of such change are demanded; but how can such proofs be afforded? The observer may, it is true, produce the expectorated matter, in bronchitis, or the alvine discharges in dysentery, but he has only to open the eyelids in ophthalmia to see the secreted matter on the very surface which produced it, and to ascertain the exact period at which it makes its appearance, and at which it ceases to flow. It must, I think, be admitted that a correct knowledge of the state and nature of the secretions during inflammation of mucous membranes, is of great importance toward an accurate diagnosis and prognosis, yet it must, I think, also be admitted that the information respecting it is very imperfect, and that the erroneous conclusions on the subject are abundant. This information I maintain can be acquired, and these erroneous conclusions avoided, in part at least, by an accurate examination of the conjunctiva. The limits assigned to this communication, do not permit me to dwell upon the illustrations derived from observation of other affections of the tegumentary coverings of the eye, which might be made available in pathological inquiry in general, but those who may feel inclined to avail themselves of such a source of inflammation may rely upon it that they are abundant. The enlargement of the glands of the inside of the eyelids, commonly called granular conjunctiva, pustular ophthalmia, psorophthalmia, lippitudo, tinea palpebrarum, epiphora, obstructed lachrymal passage, and fistula lachrymalis, all afford abundance of interesting, curious, and instructive forms of disease, not less valuable,



because on a small scale, or less important, because they are peculiar.

There is a notion prevalent in the schools, sanctioned by high authority, and established by time, that transparent and colourless parts are not so perfectly organized, or so much under the influence of vitality as other structures, and that consequently, when attacked by inflammation, they are sooner destroyed, and yield more rapidly under the influence of increased vascular action. It is of great importance to establish the truth or falsehood of this opinion, because there are so many parts of the animal frame composed of such materials. Ligaments, tendons, and fasciæ, cartilage, and probably cellular, serous, and synovial membranes, are all perhaps of this nature. Now I am convinced that careful observation of the effects of inflammation and injury of the cornea, will go far to settle the question, and to prove that the notion to which I allude, is an erroneous one, and if so, that the theories and practice founded on it, are mischievous. The assumption that colourless structures are destitute of vessels, I reject as utterly unfounded. First, on the grounds that such a vital condition would, if existing, be anomalous, and contrary to all analogy; and secondly, because we have before our eyes the demonstrated fact, that parts which in a state of complete rest, are perfectly colourless, become instantly red by irritation. This I have already said we see when the transparent conjunctiva is stimulated, and when the skin itself blushes from mental emotion, or reddens from mere mechanical pressure or friction. To say that any part is inferior in vitality to another, or that it suffers more from inflammation or injury, in consequence of such inferiority, appears to me to be as much as to say that nature's works are imperfect or unsuited to the purposes for which they are designed, than which nothing can be more contrary to observation, or so much at variance with rational views of life and organization. It is not that vascular distribution is limited, or the power of nutritive secretion feeble, neither is it that the growth or reparation after injury is less energetic, but that these functions are carried on in some respects differently from the manner in which similar functions are carried on in other structures. The cornea, a peculiar description of animal structure, eminently transparent, and not admitting a particle of red blood into its vessels, exhibits powers of reparation and growth, not only equal, but, in my opinion, superior to those of other parts remarkable for the



quantity of red blood circulating in them. I know not in the whole body a part which unites by, what we call, first intention, so frequently, or under circumstances apparently so unfavourable, as this colourless texture. In extracting a cataract we run the knife through the cornea from one side to the other, then pass an instrument between the lips of the wound to open the capsule of the lens, and finally force the lens, and often some of the vitreous humour through the aperture; yet when we bring the edges into apposition, and bandage up the eyelids, we generally find the parts united after forty-eight hours, although the cut edges are bathed on the inside with the aqueous humour, and on the outside with the tears. I have often been surprised and disappointed at what I may call the pertinacity with which wounds of the cornea unite when attempting to reduce by tapping the prominence of the cornea projecting as a staphyloma, or forming part of the general enlargement in hydrophthalmia. Day after day have I pushed the extracting knife into the chamber of aqueous humour, and day after day have I found the opening re-united, and the distending fluid reproduced. If any man would take a valuable lesson in that branch of pathology which embraces the study of the process of ulceration, let him watch the cornea when affected by slough, abscess, or spreading ulcer, and undergoing the various changes during healing, until final cicatrization.

The iris expanded, as I have already said, in the transparent aqueous humour, and behind the lenticular cornea, is admirably circumstanced for accurate observation; and when suffering from inflammation, presents appearances illustrative of that vital disturbance which the pathologist can contemplate in no other situation. How often do we find persons expressing their disappointment at the absence of appearances of disease sufficient to account for the death of an individual; but if we could view the affected organ during life, through a transparent medium, how little of such complaints should we hear. The change of colour from increased vascular turgescence, or from purulent or other deposition; the distinct abscess or globule of lymph; the impaired power of contraction and irregularity of the pupil, are all beautiful and instructive phenomena; but the adhesion of the margin of the aperture to the capsule of the crystalline lens, under the peculiar circumstances of the case, is still more remarkable; we know from observations made after death, that the pleura pulmonalis



contracts adhesions to the pleura costalis, and that the omentum unites to the intestine during inflammation, but in the eye we see the surfaces unite, although immersed in fluid, and scarcely coming into visible contact. How unsatisfactory are the proofs afforded of the direct and unequivocal action of remedies on existing disease, and how satisfactory is it to be enabled to point to some positive and undeniable evidence of the power of medicine in arresting destructive vital processes. Now, there is not to be found a better example of this than the influence of mercury in syphilitic iritis. The very day, nay, perhaps, the very hour, the metal becomes a part of the system its power over the animal poison is triumphantly displayed, and the destruction of a beautiful organ without its interposition certain to take place, is permanently averted. If we assume, without positive demonstration, that the chamber of the aqueous humour is lined by a membrane of the same nature as those lining greater cavities, as we are, I think, justified in doing what admirable examples does it present of the consequences of inflammation affecting serous membranes. There is the adhesion of the margin of the pupil to the capsule of the lens to which I have just alluded, the effusion of yellow matter under the name of onyx or hypopion, and the delicate specks of opacity on the back of the cornea, all presenting to the eye of an accurate observer living proof of what he supposes may be going on in other places under similar circumstances, but which he cannot demonstrate until death enables him to expose the parts.

I have, I think, adduced conclusive evidence in support of the position that the eye affords most valuable examples of the effects of disease on organized structures; but I cannot omit alluding to the changes which take place in the crystalline lens. Here is an organ elaborately constructed, and peculiarly circumstanced, presenting appearances which we cannot expect to meet in any other part of the body, and, therefore, affording an opportunity of observing alterations in living matter not otherwise to be distinguished. Cataract, or loss of that transparency so essential to the perfection of the part, whether from inflammation, injury, age, or congenital defect of nutrition, is a form of disease new to the pathologist when he first observes it, and highly interesting when the organic connexion of the lens with the system is considered. I do not, for a moment, adopt the erroneous notion handed down from one compiler to another, that the crystalline is enclosed in its cap-



sule without vascular communication with the rest of the frame; I know from actual dissection, which cannot deceive, that such is not the case; but, considering the marked difference in structure between the cartilaginous capsule and the fibrous body of the lens, and the delicate nature of the connexion between them, I look upon their diseases as highly instructive. The variety cataracts present in colour, consistence, texture, and even form, are most remarkable, and are much greater in number than is generally supposed; so much so, that I am at a loss to account for them, when I recollect the causes to which they may be traced; they are not, however, the less worthy of attention on that account. The effect of age in causing loss of transparency and inducing colour and induration is well seen in the hard, amber cataract of advanced life: while the soft, watery, opaque lens in children, deprived of sight by this disease, reminds us of the healthier state of the system at the earlier periods of existence. The difference as to the length of time required for the solution and absorption of a cataract broken up by operation, according to the age, sex, and vital energy of constitution of the individual, often surprises me. In a few weeks all trace of the opaque lens is obliterated in the young and healthy subject, while many months may elapse before it is removed in the aged or feeble frame. I have satisfied myself by repeated observation, that in females about the age of fifty, cataracts, although thoroughly broken up into a mere pulp, and completely exposed to the solvent powers of the aqueous humour, are singularly slow in disappearing; indeed I think that in such subjects they sometimes fail to yield at all unless again disturbed. This, I am convinced, is not owing to any imperfection in the operation or hardness of the lens, for cataracts in such persons are often very soft and easily broken; but to some languid state of the vital influence in general, and probably of the absorbent system in particular. This fact is, I think, worthy of attention, when considering other diseases in such subjects, and affords another proof of the value of observation of diseases of the eye in the study of pathology.

Practical writers have for a length of time been in the habit of alluding to the effect of organic disease, or impaired function in remote parts upon the sensibility of the retina; indeed they often go too far in attributing those forms of defective vision which they collect under the head of amaurosis to such causes.— There can, however, be no doubt that the optic nerve



is more favourably circumstanced than any other for observation of the condition of the nervous system in a state of health or disease, and that the retina presents a better index of the state of the brain when implicated in other affections than any other sensitive surface. Intolerance of light or defective vision, *muscæ volitantes*, ocular spectra, and luminous coruscations, are anxiously inquired after by the observant practitioner in cases where the head is supposed to be engaged; while the existence of such symptoms from affections of the retina itself, remind him that other organs may have their functions seriously impaired by similar causes. When the sensibility of other nerves is slightly diminished, the defect is scarcely perceived, even by the patient himself. Minute imperfections of hearing, or of touch, taste, or smell, are not noticed; while the slightest disturbance of vision excites alarm. This should teach the practitioner not to lose sight of the fact, that the functions of any organ under his immediate observation may be disturbed in consequence of disease affecting the nerves distributed to it, and that probably this occurs more frequently than is generally supposed. If vision be impaired in consequence of hæmorrhage, suckling, or other discharges in greater quantity than natural, there is no reason why other nervous functions should not be impaired by the same causes.

Of the value of observation of affections of the eye in the investigation of paralytic, spasmodic, and neuralgic diseases in general, there cannot, I think, be a question. In no other part of the body can we demonstrate the slight and delicate defects of function of this nature, although they probably exist as frequently in other situations. The spasmodic twitching of the *orbicularis palpebrarum*, apparently in consequence of some remote functional or organic disease disturbing the regular or natural controul exercised by the brain over muscular irritability, affords a good example of it. This which, in the majority of cases, is a mere temporary and unimportant consequence, in others is the forerunner of most distressing, protracted, irregular action, or spasmodic motion of the whole side of the face, causing much distortion and inconvenience. Spasmodic disease, or irregular contraction, it is true, may be observed in other parts of the body; but what I want to shew is that its first and slighter degree is best seen when the muscles of the eye are affected. These slighter irregularities of muscular action are not confined to the *orbicularis palpebrarum*. I am inclined to think that



they occur occasionally in the muscles of the eyeball also, and that some forms of temporary squint are of this nature. The paralytic affections of the muscles of the eyeball are still more instructive: I have alluded to them at length in a former essay, and have since had many additional opportunities of observing the evidence they afford of incipient cerebral disease, and the proofs they present of the effect of nervous disease in disturbing the functions of organs. Loss or defect of sight from disease affecting the optic nerve, and loss of power of the muscles from disease of the third, fourth, and sixth nerves, exhibit specimens of paralytic defect more distinct and well-defined than any other to be seen in the whole body, and consequently more valuable toward a successful investigation of such affections. Neuralgic or painful diseases of the eye, arising from nervous imperfection, present excellent examples of this distressing malady: from the slighter forms of them, which render the motions of the pupil disagreeable, to the worst cases of tic douloureux. From our being able to distinguish the nerves of sensation from the nerves of motion in this situation more perfectly than in others, the various shades and forms of neuralgia may be more easily traced to their source, and the seat of the disease more easily determined. I know not of any part of the body in which disease or destruction of a nerve can be shewn to entail the destruction of the part to which it is distributed, except in the eye, when the cornea becomes inflamed and sloughs in consequence of disease or injury of the fifth pair of nerves. I could easily multiply examples to strengthen the arguments I have advanced to prove that diseases of the eye are eminently calculated to afford instructive illustration of disease in other situations; but I do not think that additional proof is required, and therefore dismiss the subject here, recommending it to the attentive consideration of the reader.

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